National Nuclear Security Administration
Sandia Site Office
P.O. Box 5400
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John E. Kieling, Acting Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505

Subject: June 2011 Consolidated Quarterly Report for Environmental Restoration Operations (CQ Report) and Modification of the Groundwater Reporting Schedule for the CQ Report

Dear Mr. Kieling:

On behalf of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation (Sandia), DOE/NNSA is submitting the June 2011 CQ Report. This CQ Report addresses all quarterly reporting (February through April 2011) required under the *Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent and the Chemical Waste Landfill (CWL) Closure Plan* for Sandia National Laboratories/New Mexico, Environmental Protection Agency EPA No. 5890110518.

In addition, DOE/NNSA and Sandia propose to modify the schedule for reporting groundwater data in future CQ Reports. The current schedule does not allow adequate time for sampling the increased number of wells, laboratory analysis, data validation, date interpretation, review, approval, and transmittal of the CQ Report. Therefore, DOE/NNSA and Sandia propose to report groundwater data within six months of data collection (rather than three months).

SNL/NM personnel plan to implement this modification with the next scheduled CQ Report due on September 30, 2011, unless the New Mexico Environment Department formally notifies DOE/NNSA of an objection. To implement the change, the September 2011 CQ Report will provide the normal progress reporting, but no groundwater data. The complete CQ Report (with progress reporting and groundwater data) will begin again with the December 2011CQ Report.

Should you have any questions regarding this transmittal, please feel free to contact me at (505) 845-6036 or Joe Estrada of my staff at (505) 845-5326. For perchlorate or CWL groundwater related items, please contact Carolyn Holloway of my staff at (505) 845-5248.

Sincerely,

Kimberly A Davis for

Patty Wagner
Manager

Enclosure

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CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

Document title: **Environmental Restoration Operations Consolidated Quarterly Report, June 2011**

Document author: **John Cochran, Department 06234**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

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and

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Ms. Patty Wagner, Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Site Office
Owner and Co-Operator

Sandia National Laboratories, New Mexico

Environmental Restoration Operations

A U.S. Department of Energy Environmental Cleanup Program

Consolidated Quarterly Report

February through April 2011

June 2011

United States Department of Energy
Sandia Site Office

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CONSOLIDATED
QUARTERLY REPORT

June 2011

SANDIA NATIONAL LABORATORIES, NEW MEXICO (SNL/NM)

ENVIRONMENTAL RESTORATION OPERATIONS

U.S. DEPARTMENT OF ENERGY (DOE):	SANDIA SITE OFFICE
CONTRACTOR:	SANDIA CORPORATION
PROJECT MANAGER:	John Cochran

NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT: 36

SUSPECT WASTE: Radionuclides, metals, organic compounds, and explosives

OVERVIEW

This Consolidated Quarterly Report for SNL/NM Environmental Restoration Operations addresses all quarterly reporting requirements pertaining to the Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent, and the Chemical Waste Landfill Closure Plan. The 36 Potential Release Sites that require corrective action under the Permit and Compliance Order consist of 27 Solid Waste Management Units, which include the Mixed Waste Landfill. The remaining potential release sites are 9 Area of Concern Sites, which include 8 Drain and Septic System Sites and the Tijeras Arroyo Groundwater Area of Concern. The following entities and reporting periods are addressed as follows:

SECTION I:
Environmental Restoration Operations Quarterly Report, reporting period:
February through April 2011

SECTION II:
Chemical Waste Landfill Quarterly Closure Progress Report, reporting period:
February through April 2011

SECTION III:
Perchlorate Screening Quarterly Monitoring Report, reporting period:
January through March 2011

SECTION IV:
Solid Waste Management Units 149 and 154 Quarterly Monitoring Report, reporting period:
January through March 2011

ABBREVIATIONS AND ACRONYMS

μg/L	microgram(s) per liter
AOC	Area of Concern
AOP	Administrative Operating Procedure
BSG	Burn Site Groundwater
BW	background well
CAC	Corrective Action Complete
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
CME	Corrective Measures Evaluation
CMI	Corrective Measures Implementation
COA	certificates of analyses
CTF	Coyote Test Field
CWL	Chemical Waste Landfill
CY	Calendar Year
CYN	Canyons (Burn Site)
DI	deionized
DO	dissolved oxygen
DOE	U.S. Department of Energy
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration Operations
ET	evapotranspirative
FB	field blank
FOP	Field Operating Procedure
FY11	Fiscal Year 2011
GEL	GEL Laboratories, LLC
GWPP	Groundwater Protection Program
HE	high explosives
HQ	hazard quotient
HWMF	Hazardous Waste Management Facility
lb(s)	pound(s)
LE	Landfill Excavation
LTES	Long-Term Environmental Stewardship
LTMMP	Long-Term Monitoring and Maintenance Plan
MCL	maximum contaminant level
MDA	minimum detectable activity
MDL	method detection limit

mg/L	milligram(s) per liter
mL	milliliter(s)
MW	monitoring well
MWL	Mixed Waste Landfill
ND	nondetect
NMED	New Mexico Environment Department
NOD	Notice of Disapproval
NPN	nitrate plus nitrite
NTU	nephelometric turbidity unit
ORP	oxidation-reduction potential
pCi/L	picocurie(s) per liter
pH	potential of hydrogen
PPE	personal protective equipment
PQL	practical quantitation limit
QC	quality control
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-trinitro-triazine
RPD	relative percent difference
Sandia	Sandia Corporation
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories, New Mexico
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
TAL	Target Analyte List
TB	trip blank
TSCA	Toxic Substances Control Act
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
VZMS	Vadose Zone Monitoring System

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SECTION I
ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT

1.0 Introduction

This Environmental Restoration (ER) Operations Consolidated Quarterly Report (ER Quarterly Report) discusses ongoing corrective actions being implemented by Sandia National Laboratories, New Mexico (SNL/NM) ER Operations. The following sections outline the status of regulatory closure activities, addressing ER Operations investigation, project management, site-wide hydrogeologic characterization, and Long-Term Environmental Stewardship (LTES) activities conducted during the February through April 2011 quarterly reporting period.

2.0 Environmental Restoration Operations Work Completed

2.1 Mixed Waste Landfill Investigation Activities

- The U.S. Department of Energy (DOE) and Sandia Corporation (Sandia) continued preparation of a draft revised Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan (LTMMP) and, on February 17, 2011, met with New Mexico Environment Department (NMED) representatives to discuss revisions to the LTMMP, which was originally submitted to the NMED in September 2007 (SNL/NM September 2007). The topics discussed on February 17 included (1) LTMMP updates and revisions needed to address the Final Order and Corrective Measures Implementation (CMI) Plan Notice of Disapproval (NOD) Process, (2) the LTMMP monitoring program for various media, (3) updated trigger levels for surface soil and groundwater monitoring, (4) the statistical methodology for evaluating groundwater monitoring results and determining trigger level exceedances, and (5) the schedule for the Five-Year Reevaluation Report. The NMED provided informal feedback and agreed to future meetings to discuss LTMMP revision issues in lieu of formal comments.

- DOE/Sandia submitted a letter to the NMED on March 23, 2011 (Wagner March 2011), requesting approval to perform additional supplemental watering and evapotranspirative (ET) cover (ET Cover) maintenance activities at the MWL through 2013 in lieu of an approved LTMMP. The letter included information detailing the procedure to document and track supplemental watering, specifying limits to the amount of water that could be applied, and addressing other cover maintenance activities that may be performed as needed. The purpose of supplemental watering and maintenance activities is to establish

healthy, self-sustaining native vegetation on the MWL ET Cover. The NMED approved the request in a letter dated April 1, 2011 (NMED April 2011).

- On April 21, 2011, the need for constructing an access gate in the MWL southern perimeter fence to minimize traffic on the ET Cover associated with ongoing maintenance activities was discussed with the NMED and documented in an e-mail on April 27, 2011. The NMED approved the request via e-mail on April 28, 2011. A revised final site plan as-built drawing will be provided to the NMED in the revised LTMMP documenting the southern access gate.

- As summarized in the previous ER Quarterly Report (SNL/NM March 2011), DOE/Sandia have implemented all recommendations documented in the NMED-approved "MWL Toluene Investigation Report" (NMED January 2011; SNL/NM October 2010). Two issues that were ongoing with the contract analytical laboratory (GEL Laboratories, LLC) have now been resolved. The issues with resolutions are outlined as follows:

  1) Tightening the requirements used to verify that sample containers are clean: The laboratory implemented additional requirements to verify that sample containers are clean in July 2010 based on DOE/Sandia recommendations.

  2) Performing additional method blank sample analyses concurrently with the analysis of DOE/Sandia environmental volatile organic compound (VOC) samples: After further discussions and review of when laboratory method blank samples are typically analyzed relative to the DOE/Sandia environmental VOC samples, DOE/Sandia determined that additional method blank sample analyses would not be necessary.

2.2 Project Management and Site Closure

Those ER sites currently undergoing regulatory and administrative closure activities are addressed in this section. Two permit modification requests are in progress with the NMED at this time and are summarized in Sections 2.2.1 and 2.2.2. In April 2010, DOE/Sandia received formal written communication from the NMED regarding its decisions on these sites (NMED April 2010). The decisions, presented in the NMED letter dated April 8, 2010, are summarized in Section 2.2.3.

2.2.1 Permit Modification Request Submitted in March 2006

- Twenty-six sites were submitted to the NMED for the final determination of Corrective Action Complete (CAC) in March 2006 (Wagner March 2006). The sites included 19 Solid Waste Management Units (SWMUs) and 7 Areas of Concern (AOCs). The NMED issued the "Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification of the Resource Conservation and Recovery Act (RCRA) Permit for SNL/NM" for these 26 sites in December 2007 (NMED December 2007). The NMED public review and comment period ended in February 2008. The SWMUs and AOCs included in this permit modification request are listed as follows:

    - SWMUs 4, 5, 46, 49, 52, 68, 91, 101, 116, 138, 140, 147, 149, 150, 154, 161, 196, 233, and 234

    - AOCs 1090, 1094, 1095, 1114, 1115, 1116, and 1117

2.2.2 Permit Modification Request Submitted in January 2008

- Five sites were submitted for the final regulatory determination of CAC in a permit modification request in January 2008 (Wagner January 2008). This permit modification included all remaining SNL/NM ER sites with the exception of three active sites (SWMUs 83, 84, and 240), three groundwater investigation sites (Tijeras Arroyo Groundwater [TAG], Technical Area [TA]-V, and Burn Site Groundwater [BSG]), and the MWL (SWMU 76). The final report of the CMI for the MWL was submitted in January 2010 (SNL/NM January 2010) and is pending NMED approval. The MWL is addressed separately in Section 2.1 of this ER Quarterly Report. The CWL is addressed separately in Section 2.3.5 if this ER Quarterly Report. The four SWMUs and one AOC included in the January 2008 permit modification request are listed as follows:

    - SWMUs 8, 28-2, 58, and 105
    - AOC 1101

2.2.3 Status of Permit Modification Requests Submitted in March 2006 and January 2008

- In April 2010, DOE/Sandia received a letter from the NMED entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010). This letter included four main sections as follows: (1) "SWMUs Requiring Additional Corrective

Action," (2) "SWMUs/AOCs to be Subject to Groundwater Monitoring Controls," (3) "SWMUs/AOCs to be Restricted to Industrial Land Use," and (4) "SWMUs/AOCs that do not Require Corrective Action." The NMED requirements stated in this letter are summarized as follows:

- The section titled, "SWMUs Requiring Additional Corrective Action," specifies additional characterization requirements for SWMU 68 (Old Burn Site), SWMU 149 (Building 9930 Septic System), SWMU 154 (Building 9960 Septic System and Seepage Pits), and SWMU 8/58 (Open Dump [Coyote Canyon Blast Area]/Coyote Canyon Blast Area). Activities associated with these requirements are summarized in Section 2.3 of this ER Quarterly Report. Analytical results for groundwater monitoring samples associated with SWMUs 149 and 154 are discussed in Sections III and IV of this ER Quarterly Report.

- The section titled, "SWMUs/AOCs to be Subject to Groundwater Monitoring Controls," specifies that annual groundwater monitoring is to be conducted at SWMUs 49 and 116. Groundwater monitoring results are summarized in Sections 2.3.8 and 2.3.9 of this ER Quarterly Report.

- The section titled, "SWMUs/AOCs to be Restricted to Industrial Land Use," indicates that the NMED intends to restrict the future land use of the following SWMUs/AOCs to industrial:

  1. SWMU 4 – Liquid Waste Disposal System Surface Impoundments
  2. SWMU 46 – Old Acid Waste Line Outfall
  3. SWMU 91 – Lead Firing Site
  4. SWMU 196 – Building 6597 Cistern (TA-V)
  5. SWMU 234 – Storm Drain System Outfall
  6. AOC 1090 – Building 6721 Septic System (TA-III)

- The section titled, "SWMUs/AOCs that do not Require Corrective Action," includes the following SWMUs/AOCs:

  1. SWMU 4 – Liquid Waste Disposal System Surface Impoundments
  2. SWMU 5 – Liquid Waste Disposal System Drainfield
  3. SWMU 28-2 – Mine Shaft
  4. SWMU 46 – Old Acid Waste Line Outfall
  5. SWMU 49 – Building 9820 Drains (Lurance Canyon)
  6. SWMU 91 – Lead Firing Site
  7. SWMU 101 – Building 9926/9926A Septic System and Seepage Pit (Coyote Test Field [CTF])
  8. SWMU 105 – Mercury Spill (Building 6536)
  9. SWMU 116 – Building 9990 Septic System (CTF)

10. SWMU 138 – Building 6630 Septic Systems (TA-III)
11. SWMU 140 – Building 9965 Septic System and Drywell (Thunder Range)
12. SWMU 147 – Building 9925 Septic Systems (CTF)
13. SWMU 150 – Building 9939/9939A Septic System and Drainfield (CTF)
14. SWMU 161 – Building 6636 Septic System (TA-III)
15. SWMU 196 – Building 6597 Cistern (TA-V)
16. SWMU 233 – Storm Drain System Outfall
17. SWMU 234 – Storm Drain System Outfall
18. AOC 1090 – Building 6721 Septic System (TA-III)
19. AOC 1094 – Live Fire Range East Septic System (Lurance Canyon)
20. AOC 1095 – Building 9938 Seepage Pit (CTF)
21. AOC 1101 – Building 885 Septic System
22. AOC 1114 – Building 9978 Drywell (CTF)
23. AOC 1115 – Former Offices Septic System (Solar Tower Complex)
24. AOC 1116 – Building 9981A Seepage Pit (Solar Tower Complex)
25. AOC 1117 – Building 9982 Drywell (Solar Tower Complex)

2.3 Site-Wide Hydrogeologic Characterization

The following sections present site-wide hydrogeologic characterization activities conducted at three groundwater investigation sites (TA-V, BSG, and TAG), at the MWL and Chemical Waste Landfill (CWL), and at the seven SWMUs subject to groundwater monitoring controls as discussed in Section 2.2.3 of this ER Quarterly Report.

Figure 1
Installation of Soil-Vapor Sampling Tubes in a 500-Foot Deep Soil-Vapor Monitoring Well at TA-V

2.3.1 Technical Area V Groundwater

- In March 2011, DOE/Sandia completed installation of the three soil-vapor monitoring wells (Figure 1) described in the work plan attached to the DOE/Sandia response to the NMED third NOD on the "TA-V Corrective Measures Evaluation (CME) Report" (SNL/NM July 2005).

- Groundwater sampling at TA-V was conducted in April 2011. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report; other analytical results will be presented and discussed in the Calendar Year (CY) 2011 Groundwater Protection Program (GWPP) Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.3.2 Burn Site Groundwater

- Groundwater sampling for the BSG Investigation was conducted in January and February 2011. The perchlorate analytical results are discussed in Section III of this ER Quarterly Report; other analytical results will be presented and discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

- DOE/Sandia continued preparing a report describing the fieldwork performed in accordance with the BSG Characterization Work Plan (SNL/NM November 2009). This field report will present analytical data from the soil sampling program and the first two groundwater sampling events at the newly installed wells.

2.3.3 Tijeras Arroyo Groundwater

- Groundwater sampling for the TAG investigation was completed in February 2011. Analytical results will be discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.3.4 Mixed Waste Landfill Groundwater

- In the previous ER Quarterly Report, DOE/Sandia incorrectly stated that the requirement for eight consecutive quarters of groundwater sampling at MWL groundwater monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) was completed in October 2009 (SNL/NM March 2011). The correct completion date for the required eight consecutive quarters of sampling at MWL was July 2010. The sampling frequency for all existing MWL monitoring wells is now annual in accordance with Table XI-1 of the Compliance Order on Consent (NMED April 2004). All CY 2010 groundwater monitoring results will be presented in the MWL Annual Groundwater Monitoring Report for CY 2010 (anticipated delivery to the NMED by summer 2011).

2.3.5 Chemical Waste Landfill Groundwater

- No CWL groundwater monitoring activities were performed during this reporting period (February through April 2011).

2.3.6 SWMUs 8/58 Groundwater

- No groundwater monitoring activities were performed at SWMUs 8/58 during this reporting period (February through April 2011).

2.3.7 SWMU 68 Groundwater

- No groundwater monitoring activities were performed at SWMU 68 during this reporting period (February through April 2011).

2.3.8 SWMU 49 Groundwater

- Annual groundwater sampling for SWMU 49 was conducted in March 2011. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report; other analytical results will be discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.3.9 SWMU 116 Groundwater

- Annual groundwater sampling for SWMU 116 was conducted in March 2011. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report; other analytical results will be discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.3.10 SWMU 149 Groundwater

- Groundwater sampling for SWMU 149 was conducted in March 2011. Analytical results for this sampling event are presented in Section IV of this ER Quarterly Report. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report. Analytical results will also be discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.3.11 SWMU 154 Groundwater

- Groundwater sampling for SWMU 154 was conducted in March 2011. Analytical results for this sampling event are presented in Section IV of this ER Quarterly Report. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report. Analytical results will also be discussed in the CY 2011 GWPP Annual Groundwater Monitoring Report (anticipated submittal to the NMED in summer 2012).

2.4 Environmental Restoration Documents Submitted to the NMED Pending Regulatory Review and Approval

This section lists the ER documents that have been submitted to the NMED and are, as of this reporting period, still pending approval:

- The TA-V Groundwater CME Work Plan was submitted to the NMED on May 11, 2004 (SNL/NM April 2004).
- The BSG Interim Measures Work Plan was submitted to the NMED on May 26, 2005 (SNL/NM May 2005).
- The CME Report for the TAG Investigation was submitted to the NMED on September 1, 2005 (SNL/NM August 2005).
- The BSG CME Work Plan was submitted to the NMED on April 9, 2008 (SNL/NM March 2008a).
- The BSG Current Conceptual Model of Groundwater Flow and Contaminant Transport was submitted to the NMED on April 9, 2008 (SNL/NM March 2008b).
- The MWL CMI Report was submitted to the NMED on January 26, 2010 (SNL/NM January 2010).
- The CWL Final RCRA Closure Report was submitted to the NMED on September 27, 2010 (SNL/NM September 2010).
- The TA-V Geophysical Logs and Slug Test Results Report was submitted to the NMED on November 24, 2010 (SNL/NM November 2010).

3.0 Long-Term Environmental Stewardship/Environmental Restoration Work Completed

3.1 Corrective Action Management Unit

Corrective Action Management Unit (CAMU) post-closure care operations consist of vadose zone monitoring, leachate removal, and post-closure inspections, as required in

the Post-Closure Care Permit. Activities for this reporting period (February through April 2011) include the following:

- Weekly pumping of leachate from the leachate collection and removal system.

- Weekly inspection of the RCRA less-than-90-day accumulation area.

- Quarterly inspection of the site was performed on March 14 and March 31, 2011, and included the containment cell cover, storm water diversion structures, security fences, gates, signs, and benchmarks:

    - During site inspection activities, 3 four-wing saltbush plants and approximately 200 snakeweed plants were identified growing on the containment cell cover. Because these plants can develop extensive root systems that could damage the high-density polyethylene fabric that is part of the cover system, the saltbush and snakeweed were removed on April 19 and April 21, 2011.

    - During site inspection activities, tumbleweeds and excess vegetation were identified inside the site boundaries and along the perimeter fence. These were removed by SNL/NM Facilities personnel on April 5, 2011.

- Quarterly monitoring of the Vadose Zone Monitoring System (VZMS) was conducted in March 2011 (Figure 2). The results will be presented in the 2011 CAMU VZMS Annual Monitoring Results report (anticipated submittal to the NMED in September 2011). Waste management associated with the leachate collection and removal system was conducted and is outlined in Section 3.1.1.

- Composite leachate sampling for waste characterization was conducted on April 5, 2011.

Figure 2
CAMU Vegetative Cover (left background) with VSA (Vertical Sensor Array) and CSS (Chemical Waste Landfill and Sanitary Sewer) Subsystem Monitoring Locations (center).

3.1.1 CAMU Waste Management Activities

During this reporting period (February through April 2011), the following waste management data for the CAMU were reported:

- Waste stored on site at the beginning of this period:
  - 115 gallons of leachate
  - 2 gallons of rinsate
  - 5 pounds (lbs) personal protective equipment (PPE), paper wipes, plastic drum pump
- Waste generated on site during the period:
  - 122 gallons of leachate
  - 2 gallons of rinsate
  - 6 lbs PPE, paper wipes, plastic drum pump
- Waste removed from the site by Hazardous Waste Management Facility (HWMF) personnel on February 9, 2011:
  - 105 gallons of leachate
  - 2 gallons of rinsate
  - 5 lbs PPE, paper wipes, plastic drum pump
- Waste removed from the site by HWMF personnel on April 7, 2011:
  - 102 gallons of leachate
  - 2 gallons of rinsate
  - 5 lbs PPE, paper wipes, plastic drum pump
- Waste remaining on site at the end of this reporting period:
  - 30 gallons of leachate
  - 1 lb PPE

3.1.2 CAMU Regulatory Activities

The NMED conducted an audit of the CAMU on February 15, 2011. There were no findings reported as a result of this audit.

3.2 Long-Term Environmental Stewardship Documents Submitted to the NMED Pending Regulatory Review and Approval

No LTES documents submitted to the NMED are pending regulatory review and approval.

4.0 References

New Mexico Environment Department (NMED), April 2004. "Compliance Order on Consent, Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10," New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), December 2007. "Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification of the RCRA Permit for Sandia National Laboratories," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2010. Letter to K. Davis (U.S. Department of Energy) and M. Walck (Sandia Corporation). "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, April 8, 2010.

New Mexico Environment Department (NMED), January 2011. Letter to P. Wagner (U.S. Department of Energy) and J. Hruby (Sandia Corporation), "Notice of Approval, Mixed Waste Landfill Toluene Investigation Report, Revised October 2010, Sandia National Laboratories, EPA ID No. NM5890110518, HWB-SNL-10-011," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2011. Letter to P. Wagner (U.S. Department of Energy) and S. Orrell (Sandia Corporation), "Request to Conduct Supplemental Watering and Cover Maintenance Activities, Mixed Waste Landfill, Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-MISC," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

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SECTION II
CHEMICAL WASTE LANDFILL QUARTERLY CLOSURE PROGRESS REPORT

This section of the Environmental Restoration (ER) Operations Consolidated Quarterly Report (ER Quarterly Report) presents the Quarterly Closure Progress Report for the Sandia National Laboratories, New Mexico (SNL/NM) Chemical Waste Landfill (CWL). This progress report has been prepared pursuant to the "CWL Final Closure Plan and Postclosure Care Permit Application" (Closure Plan) (SNL/NM December 1992). This section documents activities at the CWL for the reporting period from February through April 2011. No groundwater sampling events occurred at the CWL during this reporting period.

1.0 Introduction

All voluntary corrective measure (VCM) activities for the CWL have been completed. The CWL Landfill Excavation (LE) VCM Final Report was submitted to the New Mexico Environment Department (NMED) in April 2003 (SNL/NM April 2003) and approved by the NMED in December 2003 (Moats December 2003). The Site Operational Boundary Closure Addendum to the LE VCM Final Report was submitted to the NMED in August 2005 (SNL/NM August 2005) and approved by the NMED on October 25, 2005 (Bearzi October 2005). With the submittal of the Waste Management Addendum to the LE VCM Final Report as Appendix B in the CWL Quarterly Closure Progress Report on February 22, 2006 (SNL/NM February 2006), all LE VCM regulatory deliverables have been submitted. With the completion of the VCMs, technical meetings will be held on an as-needed basis. The public will continue to be informed of significant events through the SNL/NM ER public meeting process.

Installation of the evapotranspirative (ET) cover as an interim measure was requested in April 2004 (Wagner April 2004) and approved with conditions in September 2004 (Kieling September 2004). The ET cover was completed in September 2005 in accordance with the conditions of approval. All field activities have been completed at the CWL, including the installation of new groundwater monitoring wells CWL-BW5 (background well), CWL-MW9, CWL-MW10, and CWL-MW11 and decommissioning of wells CWL-BW4A, CWL-MW4, CWL-MW5U/L, and CWL-MW6U/L. Long-term monitoring under the NMED-approved CWL Post-Closure Care Permit (NMED October 2009a) will commence after NMED approval of final closure.

2.0 Status of Closure

The CWL Toxic Substances Control Act (TSCA) Final Report was submitted to the U.S. Environmental Protection Agency (EPA) and NMED on November 2, 2006 (SNL/NM November 2006). This final TSCA report documents the completion of all closure activities specified in the "Risk-Based Approval Request, 40 CFR [Code of Federal Regulations] 761.61(c) Risk-Based Method for Management of PCB [Polychlorinated Biphenyl] Materials" (SNL/NM October 2001), approved by the EPA in June 2002 (Cooke June 2002).

The 2008 through 2009 negotiations were completed on October 15, 2009, and documented in the settlement agreement and Final Order In the Matter of Application for a Post-Closure Care Hazardous Waste Permit for the Chemical Waste Landfill, Sandia National Laboratories No. NM5890110518 (Final Order) (NMED October 2009a), which also included the final Post-Closure Care Permit. The NMED issued the "Notice of Approval, Final Remedy and Closure Plan Amendment, Chemical Waste Landfill" on October 16, 2009 (NMED October 2009b). The NMED approval, dated October 16, 2009, included the final versions of two revisions to the Closure Plan that were part of the Closure Plan Amendment as Changed: Chapter 12 and Appendix G, Revision 4, Section 1.0.

The Final Resource Conservation and Recovery Act (RCRA) Closure Report documenting closure in accordance with all CWL Closure Plan requirements was submitted to the NMED on September 27, 2010 (SNL/NM September 2010). The required 40 CFR 265.116 (survey plat) and 40 CFR 265.119 (notation on property deed) notices were submitted to the Bernalillo County Zoning Commission and County Clerk, respectively, as well as the NMED, in early September 2010 in accordance with the Closure Plan. These notices were also included as an appendix in the Final RCRA Closure Report (SNL/NM September 2010), which documents the backfilling of the former CWL, installation of the at-grade ET cover, ET cover revegetation activities performed in 2009, installation of the four new groundwater monitoring wells performed in 2010, and the final end-state conditions and cumulative risk assessment.

All required closure actions have now been completed in accordance with the CWL Closure Plan and the 2008 through 2009 negotiations that covered the CWL Closure Plan Amendment As Changed (revisions to Chapter 12 and to Appendix G [NMED October 2009b]), the CWL Post-Closure Care Permit, and the CWL Corrective Measures Study Report and Final Remedy. The new groundwater monitoring well network, installed in 2010 (CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11) in accordance with the Closure Plan Amendment as Changed (Appendix G revision), was sampled for the first time in November and December 2010. The results for this semiannual monitoring event are presented in the previous ER Quarterly Report (SNL/NM March 2011).

The NMED conducted a site visit and closure inspection during this reporting period on April 21, 2011, as part of the review and approval process for CWL closure. U.S. Department of Energy (DOE) and Sandia Corporation (Sandia) personnel accompanied a representative from the NMED to the site. The site visit included a visual inspection of the groundwater and soil-gas monitoring network, the ET cover, and associated storm water diversions, fencing, signage, and locked gate.

3.0 Groundwater and Soil-Gas Monitoring

No groundwater monitoring or soil-gas sampling activities were performed at the CWL during this reporting period. Soil-gas sampling is not required under the Closure Plan but will be a requirement under the CWL Post-Closure Care Permit (NMED October 2009a).

4.0 Evapotranspirative Cover Maintenance

In June 2009, the DOE and Sandia submitted a revegetation plan to the NMED for the CWL at-grade ET cover (SNL/NM June 2009) because the initial seeding performed in 2005 was not successful (i.e., the planted native grass species were overgrown by weedy invasive species). The NMED approved the plan on July 31, 2009 (Bearzi July 2009). Revegetation activities were performed from August through November 2009 and included removing weeds, applying new seed and gravel mulch over the ET cover (1.7 acres enclosed by the perimeter security fence) and surrounding areas (an additional 0.5 acres), and performing supplemental watering. This revegetation project, which is documented in the CWL Final RCRA Closure Report (SNL/NM September 2010), resulted in robust growth of native perennial grass species that replaced the formerly dominant annual invasive species.

In March 2010, additional ET cover maintenance work was performed at the CWL. Undesirable plant species, in particular Russian thistle (i.e., tumbleweeds), were cleared from the ET cover surface and perimeter fence. In November 2010, weed removal was again performed and included, along with the Russian thistle, four-wing saltbush, which had been inadvertently added to the seed mix during the 2009 seeding effort.

5.0 Projected Activities for the Upcoming Quarter

The first Calendar Year 2011 groundwater monitoring event is scheduled for June. Additional ET cover maintenance activities may also be performed during the upcoming quarter, which could include weed and four-wing salt bush removal from the cover surface and clearing of vegetation from the perimeter fence.

After NMED approval of the CWL Final RCRA Closure Report and final closure documentation, the Closure Plan will no longer be in effect, and the CWL Post-Closure Care Permit (NMED October 2009a) will become the sole source of operating conditions. The NMED approval of final closure of the CWL is anticipated during the next quarter.

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SECTION III
PERCHLORATE SCREENING QUARTERLY MONITORING REPORT

1.0 Introduction

Section IV.B of the Compliance Order on Consent (the Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia) for Sandia National Laboratories, New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells at SNL/NM be sampled for perchlorate (NMED April 2004). This report summarizes the perchlorate screening monitoring completed during the First Quarter of Calendar Year (CY) 2011 (January, February, and March 2011) in response to the requirements of the Order. The outline of this report is based on the required elements of a "Periodic Monitoring Report" described in Section X.D. of the Order (NMED April 2004).

In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of the letter report was to summarize previous correspondence and sampling results and to outline proposed future work to comply with NMED requirements for perchlorate screening in groundwater. As specified in the letter report, quarterly reports will be submitted for wells active in the perchlorate-screening monitoring well network.

Based on the NMED response (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. In November 2008, DOE/Sandia received approval from the NMED to proceed to semiannual reporting (NMED November 2008); however, upon further consideration, the NMED once more required quarterly reporting (NMED April 2009). This did not alter the previously negotiated frequency for CYN-MW6, an existing Burn Site Groundwater (BSG) study area monitoring well that has been under the sampling and reporting requirements of the Order since the well was installed and which will remain at a semiannual frequency for sampling and reporting.

This report is the twenty-first to be submitted since the November 2005 letter report; the previous reports were submitted for Fourth Quarter of CY 2005 through the Fourth Quarter of CY 2010 (SNL/NM February 2006, June 2006, September 2006, December 2006, March 2007, June 2007, September 2007, December 2007, March 2008, June 2008, September 2008, December 2008, June 2009, September 2009, December 2009, March 2010, June 2010a, September 2010, December 2010a, and March 2011).

Groundwater at Canyons (Burn Site) monitoring well CYN-MW6 has been sampled 16 times; BSG well CYN-MW5 (recently reinstated) has been sampled 5 times; BSG wells CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12 have been sampled 3 times; Coyote Test Field (CTF) wells CTF-MW1, CTF-MW2, and CTF-MW3 were sampled for the first time; and Technical Area (TA)-V wells TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14 were sampled for the first time during this reporting period (Figure 1). The Order requires that new wells be sampled for perchlorate for a minimum of four quarters (NMED April 2004). Reporting will continue as long as groundwater monitoring wells remain active in the perchlorate-screening monitoring well network unless negotiated otherwise with the NMED.

2.0 Scope of Activities

This report provides perchlorate screening results for the First Quarter of CY 2011 (January, February, and March 2011) for the wells currently active in the perchlorate-screening program as shown in Figure 1 and listed in Table 1. In accordance with the requirements of Table XI-1 of the Order, a well with four consecutive quarters of nondetects (NDs) for perchlorate at the screening level/method detection limit (MDL) of 4 micrograms per liter (μg/L) is removed from the requirement of continued monitoring for perchlorate. Data from numerous wells identified in the Order have satisfied this requirement; therefore, these wells have been removed from the perchlorate-screening program. Data for these wells have been provided in previous reports and are not discussed in this current report. Wells discussed in previous perchlorate-screening reports include the following: CYN-MW1D, CYN-MW5 (recently reinstated), CYN-MW7, CYN-MW8, LWDS-MW1, MRN-2, MRN-3D, MWL-BW1, MWL-BW2, MWL-MW1, MWL-MW7, MWL-MW8, MWL-MW9, NWTA3-MW2, SWTA3-MW4, TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27.

SNL/NM personnel performed groundwater sampling at 13 wells on the dates listed in Table 1. The majority of the wells were installed after the Order was finalized and were therefore required to be sampled for perchlorate as “new” wells; the other wells were sampled to meet other regulatory requirements (discussed in Section 3.0). Groundwater sampling activities were conducted in accordance with procedures outlined in the following investigation-specific sampling and analysis plans (SAPs) entitled:

SNL EGIS DEPT 4142 DHelfrich GIS MAP-ID = 110154 nmloc_dh.aml 28-APR-2011

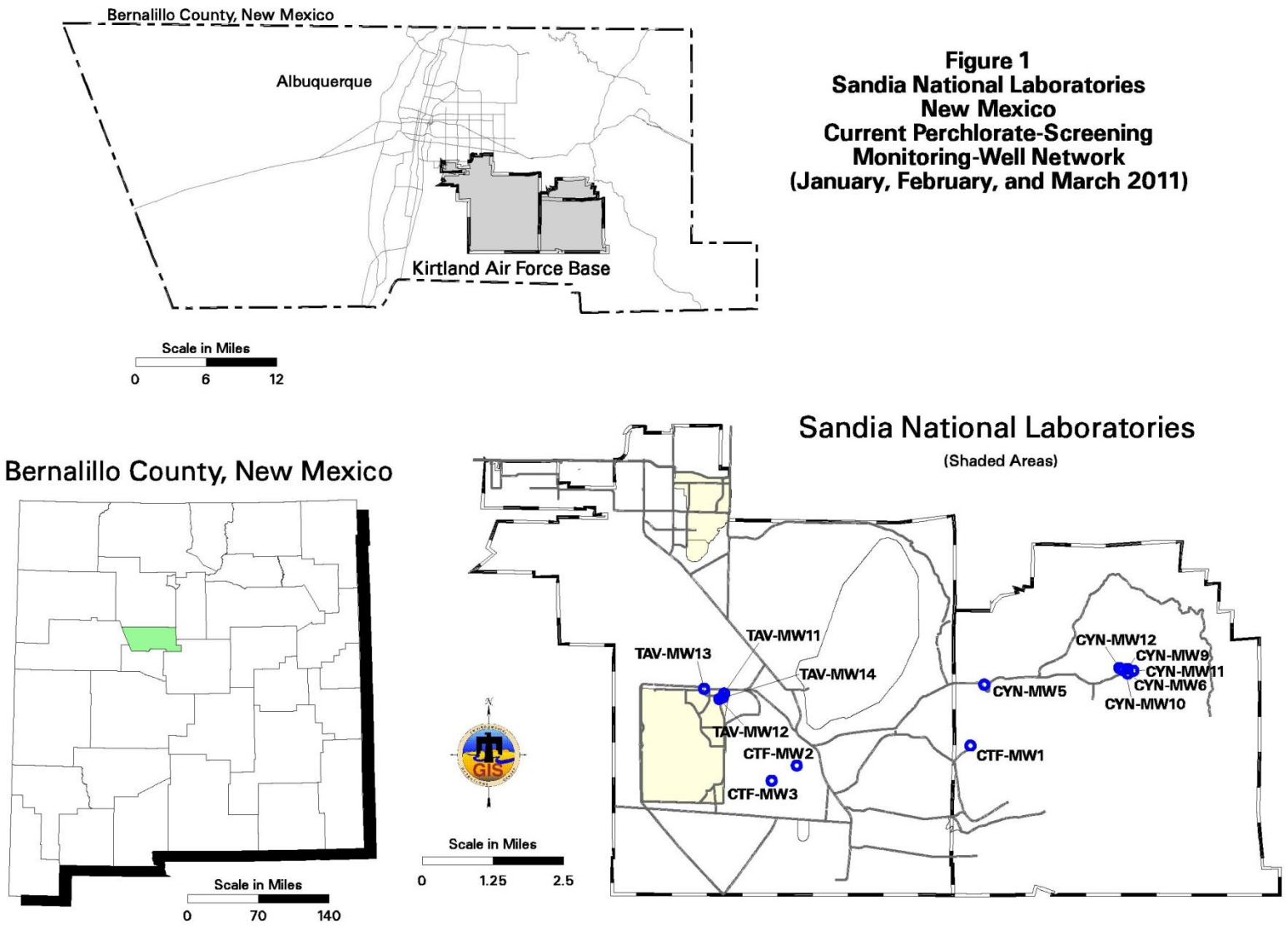

Figure 1
Sandia National Laboratories
New Mexico
Current Perchlorate-Screening
Monitoring-Well Network
(January, February, and March 2011)

Table 1
Current Perchlorate-Screening Monitoring Well Network
First Quarter, CY 2011
(January, February, and March 2011)

Well	Date Sampled	Number of Consecutive Sampling Events[a]	Remaining Number of Sampling Events[b]	Sampling Equipment
CTF-MW1	07-Mar-11	1	NA[c]	Bennett™ Pump
CTF-MW2	08-Mar-11	1	7	Bennett™ Pump
CTF-MW3	09-Mar-11	1	7	Bennett™ Pump
CYN-MW5	10-Mar-11	1	NA[c]	Bennett™ Pump
CYN-MW6	14-Feb-11	16	TBD[d]	Bennett™ Pump
CYN-MW9	15-Feb-11	3	1	Bennett™ Pump
CYN-MW10	09-Feb-11	3	1	Bennett™ Pump
CYN-MW11	08-Feb-11	3	1	Bennett™ Pump
CYN-MW12	10-Feb-11	3	1	Bennett™ Pump
TAV-MW11	06-Jan-11	1	3	Bennett™ Pump
TAV-MW12	19-Jan-11	1	3	Bennett™ Pump
TAV-MW13	10-Jan-11	1	3	Bennett™ Pump
TAV-MW14	20-Jan-11	1	3	Bennett™ Pump

Notes

[a]Includes this sampling event.
[b]Per the requirements of Table XI-1 of the Order (NMED April 2004), a well will be removed from the perchlorate-screening monitoring well network after four quarters unless perchlorate is detected above the screening level/MDL of 4 μg/L. If perchlorate is detected above the screening level/MDL in a specific well, monitoring will continue at that well at a frequency negotiated with the NMED.
[c]NA = Not Applicable. This well monitors a Solid Waste Management Unit that is subject to groundwater monitoring controls and will be sampled annually per NMED requirements (NMED April 2010).
[d]TBD = To be determined. This well has been sampled for the required initial four quarters. Because perchlorate concentrations in this well have exceeded the screening level, DOE/Sandia and the NMED have agreed to further characterization requirements in the BSG study area (NMED February 2010).
μg/L = Microgram(s) per liter.
CY = Calendar Year.
DOE = U.S. Department of Energy.
MDL = Method detection limit.
NMED = New Mexico Environment Department.
Sandia = Sandia Corporation.

- "TA-V Groundwater Monitoring, Mini-SAP for Second Quarter FY11 [Fiscal Year 2011]" (SNL/NM December 2010b)

- "Burn Site Groundwater Monitoring, Mini-SAP for Second Quarter, FY11" (SNL/NM January 2011).

- "SWMU [Solid Waste Management Unit] 49 and 116 Groundwater Monitoring, Mini-SAP for FY11 Annual Sampling" (SNL/NM February 2011a).

- "SWMU 149 Groundwater Monitoring, Mini-SAP for Second Quarter, FY11" (SNL/NM February 2011b).

- "SWMU 154 Groundwater Monitoring, Mini-SAP for Second Quarter, FY11" (SNL/NM February 2011c).

As described in the Mini-SAPs, groundwater sampling was performed in accordance with current SNL/NM Environmental Management, Long-Term Environmental Stewardship (LTES) Project Field Operating Procedures (FOPs). A portable Bennett™ groundwater sampling system was used to collect the groundwater samples. The sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells in accordance with procedures described in FOP 05-03, "LTES Groundwater Sampling Equipment Decontamination" (SNL/NM August 2007a). With the exception of CYN-MW6, all wells were purged a minimum of one saturated screen volume before sampling in accordance with FOP 05-01, "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM August 2007b). Well CYN-MW6 is a low-yield monitoring well and was purged dry and allowed to recover before sampling to ensure a representative groundwater sample.

Field water-quality measurements for turbidity, potential of hydrogen (pH), temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the well prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with a YSI™ Model 620 water quality meter. Turbidity was measured with a HACH™ Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units

- pH is within 0.1 units

- Temperature is within 1.0 degrees Celsius

- SC is within 5 percent

Field Measurement Logs documenting details of well purging and water quality measurements have been submitted to the SNL/NM Customer Funded Records Center.

The groundwater samples were submitted to GEL Laboratories, LLC (GEL) for chemical analysis of perchlorate using U.S. Environmental Protection Agency Method 314.0 (EPA November 1999). The sample identification, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table 2. The analytical report from GEL, including certificates of analyses (COA) (Appendix A), analytical methods, MDLs, practical quantitation limits, dates of analyses, results of quality control (QC) analyses, and data validation findings (Appendix B) have been submitted to the SNL/NM Customer Funded Records Center.

Table 2
Sample Details for First Quarter, CY 2011 Perchlorate Sampling

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CTF-MW1	090227-020	613444	SWMU 116
CTF-MW2	090237-020 090238-020	613448	SWMU 154
CTF-MW3	090243-020 090244-020	613450	SWMU 149
CYN-MW5	090232-020 090233-020	613446	SWMU 49
CYN-MW6	090000-020	613413	BSG
CYN-MW9	090006-020	613414	BSG
CYN-MW10	089994-020	613411	BSG
CYN-MW11	089990-020 089991-020	613410	BSG
CYN-MW12	089997-020	613412	BSG
TAV-MW11	089917-020	613384	TAV
TAV-MW12	089935-020	613392	TAV
TAV-MW13	089921-020 089922-020	613386	TAV
TAV-MW14	089938-020	613393	TAV

Notes

AR/COC = Analysis request/chain of custody.
BSG = Burn Site Groundwater.
CTF = Coyote Test Field.
CY = Calendar Year.
CYN = Canyons (Burn Site).
SWMU = Solid Waste Management Unit.
TAV = Technical Area V.

3.0 Regulatory Criteria

In a given monitoring well, four consecutive ND results using the screening level/MDL of 4 μg/L are considered by the NMED to be evidence of the absence of perchlorate, such that additional monitoring for perchlorate in that well is not required. If perchlorate is detected

using the screening level/MDL of 4 μg/L in a specific well, then monitoring will continue at that well at a frequency negotiated with the NMED. The Order (NMED April 2004) also requires that for detections equal to or greater than 4 μg/L, DOE/Sandia will evaluate the nature and extent of perchlorate contamination, based on a screening level/MDL of 4 μg/L, and incorporate the results of this evaluation into a Corrective Measures Evaluation (CME). Section VII.C of the Order clarifies that the CME process will be initiated where there is a documented release to the environment and where corrective measures are necessary to protect human health or the environment.

In March 2007, DOE/Sandia received a letter from the NMED stating the requirement that DOE/Sandia "determine the nature and extent of the contamination and complete a Corrective Measures Evaluation for the perchlorate-impacted groundwater in the vicinity of CYN-MW6" (NMED March 2007). As this was based solely on the four quarters of monitoring results, DOE/Sandia submitted a letter to the NMED in April 2007 (SNL/NM April 2007), which recommended further characterization through continued quarterly monitoring of CYN-MW6 for four additional quarters, ending in December 2007, to ensure appropriate characterization of this well. In January 2008, DOE/Sandia requested a meeting with the NMED to discuss the need for continued monitoring or additional characterization work, and potentially, a CME.

In preparation for discussing the perchlorate-impacted groundwater in the vicinity of CYN-MW6 and to show that the requirement "to determine the nature and extent of contamination" (NMED March 2007) has been met, DOE/Sandia provided supporting information to the NMED (SNL/NM March 2008). Perchlorate in surface soil has been characterized at SWMUs in the study area (SNL/NM June 2006 and March 2008–Appendix C). Based upon these data, DOE/Sandia consider that the nature and extent of perchlorate in groundwater at the Burn Site has been sufficiently characterized. Since 2004, samples from four other monitoring wells in the vicinity of the Burn Site have been analyzed for perchlorate, including CYN-MW1D, CYN-MW5, CYN-MW7, and CYN-MW8. All of these wells were sampled for four quarters and all results were ND for perchlorate (SNL/NM March 2008–Appendix D).

In accordance with the requirements of Section VI.K.1.b of the Order (NMED April 2004), a human health risk assessment has been performed to evaluate the potential for adverse health effects from the concentrations of perchlorate detected in CYN-MW6 groundwater samples. The maximum concentration of perchlorate in samples from CYN-MW6 to date (8.93 μg/L) was used in the assessment. The calculated hazard quotient (HQ) of 0.35 is less than the NMED target level of a hazard index (the sum of all HQs) of 1.0 (NMED June 2006, SNL/NM March 2008–Appendix E).

Because perchlorate concentrations in samples from monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia initiated a negotiation process with the NMED (SNL/NM March 2007) to determine the frequency of continued monitoring. In November 2008, DOE/Sandia received approval from the NMED to proceed with semiannual monitoring of perchlorate in CYN-MW6 and proceed with semiannual reporting of all perchlorate results (NMED November 2008). Upon further consideration, the NMED once more required that DOE/Sandia resume quarterly reporting of perchlorate results with the exception of CYN-MW6 (NMED April 2009).

In April 2009, DOE/Sandia received a letter from the NMED requiring DOE/Sandia to characterize the nature and extent of the perchlorate contamination in soil and groundwater in the BSG study area (NMED April 2009). A characterization work plan was prepared and submitted to the NMED (SNL/NM November 2009), approved by the NMED (February 2010), and implemented in July 2010. In the April 2009 letter, the NMED had also requested that DOE/Sandia monitor perchlorate concentrations for a minimum of four quarters at several Tijeras Arroyo Groundwater and TA-V monitoring wells (NMED April 2009); all these wells have had four consecutive monitoring events with no perchlorate detections and have since been removed from the perchlorate sampling list.

During this quarter four monitoring wells were added to the perchlorate monitoring network based on the NMED letter of April 8, 2010, entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008) Sandia National Laboratories EPA ID #NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010). The NMED letter required work plans and groundwater monitoring at the following SWMUs:

- SWMU 49—Annual sampling of existing monitoring well CYN-MW5. This well had been sampled four times from May 2004 through February 2005. Based on four consecutive ND results, CYN-MW5 was removed from the perchlorate monitoring network (SNL/NM November 2005).

- SWMU 116—Annual sampling of existing monitoring well CTF-MW1.

- SWMU 149—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW3 for a minimum of eight quarters.

- SWMU 154—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW2 for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted a SAP for CTF-MW2 and CTF-MW3 (SNL/NM June 2010b) that was subsequently approved (with modifications) by the NMED (December 2010).

4.0 Monitoring Results

Table 3 summarizes current and historical perchlorate results for wells currently in the perchlorate-screening monitoring network. The analytical laboratory COA for the First Quarter of CY 2011 perchlorate data is included as Appendix A. Perchlorate was not detected above the screening level in the samples from the seven wells recently added to the network (CTF-MW1, CTF-MW2, CTF-MW3, TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14). Consistent with historical analytical results, perchlorate was not detected above the screening level in the samples from CYN-MW5, CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12. Also consistent with historical analytical results, perchlorate was detected above the screening level/MDL in the sample from CYN-MW6. As shown in Figure 2, the concentrations of perchlorate detected in the sample from CYN-MW6 collected in February 2011 (6.95 and 6.26 μg/L) are consistent with the average concentration detected over the life of the well. The hydrograph of CYN-MW6 (Figure 2) shows that the water table is rapidly declining in this well.

Table 4 summarizes field water quality measurements collected immediately before the groundwater samples were collected. Field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO.

The analytical data were reviewed and validated in accordance with Administrative Operating Procedure 00-03, “Data Validation Procedure for Chemical and Radiochemical Data,” Revision 2 (SNL/NM July 2007). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets for the perchlorate data are included as Appendix B.

Table 3
Summary of Perchlorate Screening Analytical Results for the Current Monitoring Well Network as of First Quarter, CY 2011

Well ID	Sample Date	AR/COC No.	Sample No.	Perchlorate Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Analytical Method[g]	Comments
CTF-MW1	07-Mar-11	613444	090227-020	ND	4.0	12	NE	U		EPA 314.0	
CTF-MW2	08-Mar-11	613448	090237-020	ND	4.0	12	NE	U		EPA 314.0	
			090238-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CTF-MW3	09-Mar-11	613450	090243-020	ND	4.0	12	NE	U		EPA 314.0	
			090244-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CYN-MW5	26-May-04	607546	065032-044	ND	4.0	12	NE	U		EPA 314.0	
	16-Sep-04	607811	065738-016	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	16-Nov-04	608047	066427-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Feb-05	608285	067442-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Mar-11	613446	090232-020	ND	4.0	12	NE	U		EPA 314.0	
			090232-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CYN-MW6	23-Mar-06	609578	075985-020	**6.92**	4.0	12	NE	J		EPA 314.0	
			075986-020	**7.44**	4.0	12	NE	J		EPA 314.0	Duplicate sample
			075985-R20	**6.39**	0.50	2.0	NE	Hh	HT, J	EPA 6850M	Verification/Re-analysis
			075986-R20	**6.48**	0.50	2.0	NE	Hh	HT, J	EPA 6850M	Verification/Re-analysis
	22-Jun-06	609929	078687-020	**6.63**	4.0	12	NE	J		EPA 314.0	
			078688-020	**6.45**	4.0	12	NE	J		EPA 314.0	Duplicate sample
			078687-021	**6.99**	1.0	4.0	NE			EPA 6850M	Verification
			078688-021	**6.92**	1.0	4.0	NE			EPA 6850M	Verification/Duplicate Sample
	20-Sep-06	610652	081626-020	**7.52**	4.0	12	NE	J		EPA 314.0	
			081626-R20	**6.96**	1.0	4.0	NE		P2	EPA 6850M	Verification/Re-analysis
	15-Dec-06	611057	083858-020	**8.46**	4.0	12	NE	J		EPA 314.0	
			083859-020	**8.93**	4.0	12	NE	J		EPA 314.0	Duplicate sample
	14-Mar-07	611200	084237-020	**8.12**	4.0	12	NE	J		EPA 314.0	
	27-Jun-07	611399	084833-020	**6.57**	4.0	12	NE	J	J-, X1	EPA 314.0	
			084833-R20	**5.94**	0.5	2.0	NE			EPA 6850M	Verification/Re-analysis
	12-Sep-07	611581	085249-020	**7.74**	4.0	12	NE	J		EPA 314.0	
			085249-R20	**6.46**	0.5	2.0	NE	Hh	J	EPA 6850M	Verification/Re-analysis
	18-Dec-07	611668	085446-020	**6.20**	4.0	12	NE	J		EPA 314.0	
			085447-020	**6.56**	4.0	12	NE	J		EPA 314.0	Duplicate sample
	10-Mar-08	611749	085661-020	**7.25**	4.0	12	NE	J		EPA 314.0	
	23-Jun-08	611912	086280-020	**6.67**	4.0	12	NE	J		EPA 314.0	
	17-Sep-08	612004	086782-020	**6.85**	4.0	12	NE	J		EPA 314.0	
	02-Mar-09	612120	087047-020	**7.24**	4.0	12	NE	J		EPA 314.0	
	30-Sep-09	612392	087734-020	**4.12**	4.0	12	NE	J	J-	EPA 314.0	
			087735-020	**4.71**	4.0	12	NE	J	J-	EPA 314.0	Duplicate sample
	03-Mar-10	612580	088180-020	**4.59**	4.0	12	NE	J		EPA 314.0	
	20-Sep-10	613279	089659-020	**6.14**	4.0	12	NE	J		EPA 314.0	

Refer to footnotes at end of table.

Table 3 (Continued)
Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network, as of First Quarter CY 2011

Well ID	Sample Date	AR/COC No.	Sample No.	Perchlorate Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Analytical Method[g]	Comments
CYN-MW6 (Continued)	14-Feb-11	613413	090000-020	**6.95**	4	12	NE	J	J-	EPA 314.0	
				6.26	0.5	2.0	NE	Hh		EPA 6850M	Verification/Re-analysis
CYN-MW9	28-Sep-10	613285	089672-020	ND	4.0	12	NE	U		EPA 314.0	
			089673-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	27-Oct-10	613321	089759-020	ND	4.0	12	NE	U		EPA 314.0	
	15-Feb-11	613414	090006-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW10	27-Sep-10	613283	089668-020	ND	4.0	12	NE	U		EPA 314.0	
	02-Nov-10	613325	089773-020	ND	4.0	12	NE	U		EPA 314.0	
			089774-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	09-Feb-11	613411	089994-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW11	29-Sep-10	613286	089675-020	ND	4.0	12	NE	U		EPA 314.0	
	01-Nov-10	613323	089765-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Feb-11	613410	089990-020	ND	4.0	12	NE	U		EPA 314.0	
			089991-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CYN-MW12	23-Sep-10	613282	089665-020	ND	4.0	12	NE	U		EPA 314.0	
	28-Oct-10	613322	089762-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Feb-11	613412	089997-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW11	06-Jan-11	613384	089917-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW12	19-Jan-11	613392	089935-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW13	10-Jan-11	613386	089921-020	ND	4.0	12	NE	U		EPA 314.0	
			089922-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
TAV-MW14	20-Jan-11	613393	089938-020	ND	4.0	12	NE	U		EPA 314.0	

Notes

[a]Result
Values in **bold** exceed the screening level/MDL
ND = Not detected (at MDL).
µg/L = Micrograms per liter.

[b]MDL
Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

[c]PQL
Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by the indicated method under routine laboratory operating conditions.

Table 3 (Concluded)
Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network, as of First Quarter CY 2011

Notes (Continued)

[d]MCL
Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11, Subpart B) and subsequent amendments or Title 20, Chapter 7, Part 1 of the New Mexico Administrative Code, incorporating 40 CFR 141.
NE = Not established.

[e]Laboratory Qualifier
H = Analytical holding time was exceeded.
h = Prep holding time was exceeded.
J = Amount detected is below the practical quantitation limit.
U = Analyte is absent or below the method detection limit.

[f]Validation Qualifier
If cell is blank, then all quality control samples meet acceptance criteria with respect to submitted samples and no qualifier was assigned.
HT = The holding time was exceeded for the associated sample analysis.
J = The associated value is an estimated quantity.
J- = The associated value is an estimated quantity with a suspected negative bias.
P2 = Insufficient quality control data to determine laboratory precision.
X1 = General data quality is suspect.

[g]Analytical Method
EPA 314.0: U.S. Environmental Protection Agency, November 1999, "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014 (EPA November 1999).
EPA 6850M: U.S. Environmental Protection Agency, April 2005, "Perchlorate in Water, Soils, and Solids Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry (HPLC/ESI/MS)," draft, Method 6850 (EPA April 2005).
AR/COC = Analysis Request and Chain of Custody.
CFR = Code of Federal Regulations.
CY = Calendar Year.
EPA = U.S. Environmental Protection Agency.
ID = Identification.

Table 4
Perchlorate Screening Groundwater Monitoring
Field Water Quality Measurements[a], First Quarter, CY 2011

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (μmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
CTF-MW1	07-Mar-11	16.31	634	411.0	7.38	0.43	71.7	7.02
CTF-MW2	08-Mar-11	14.12	3324	65.0	6.03	23.5	1.8	0.19
CTF-MW3	09-Mar-11	18.58	1605	423.7	6.91	0.20	73.3	6.83
CYN-MW5	10-Mar-11	15.93	366	439.2	6.06	0.54	48.8	4.82
CYN-MW6	14-Feb-11	17.57	1003	395.7	7.04	0.57	19.9	1.89
CYN-MW9	15-Feb-11	16.97	1067	415.9	7.01	0.33	52.1	5.03
CYN-MW10	09-Feb-11	13.35	868	407.8	7.33	0.38	66.7	6.95
CYN-MW11	08-Feb-11	14.41	944	281.0	7.24	0.88	5.4	0.55
CYN-MW12	10-Feb-11	14.82	1024	385.6	7.09	0.88	7.2	0.73
TAV-MW11	06-Jan-11	17.51	525	257.5	7.44	0.65	75.9	7.25
TAV-MW12	19-Jan-11	16.95	561	214.4	7.37	1.85	56.1	5.43
TAV-MW13	10-Jan-11	16.31	504	176.0	7.41	0.50	28.6	2.80
TAV-MW14	20-Jan-11	17.89	628	247.2	7.36	2.03	72.6	6.88

Notes

[a]Field measurements obtained immediately before the groundwater sample was collected.
°C = Degrees Celsius.
% Sat = Percent saturation.
μmho/cm = Micromhos per centimeter.
CY = Calendar Year.
ID = Identification.
mg/L = Milligrams per liter.
mV = Millivolt(s).
NTU = Nephelometric turbidity unit.
pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).

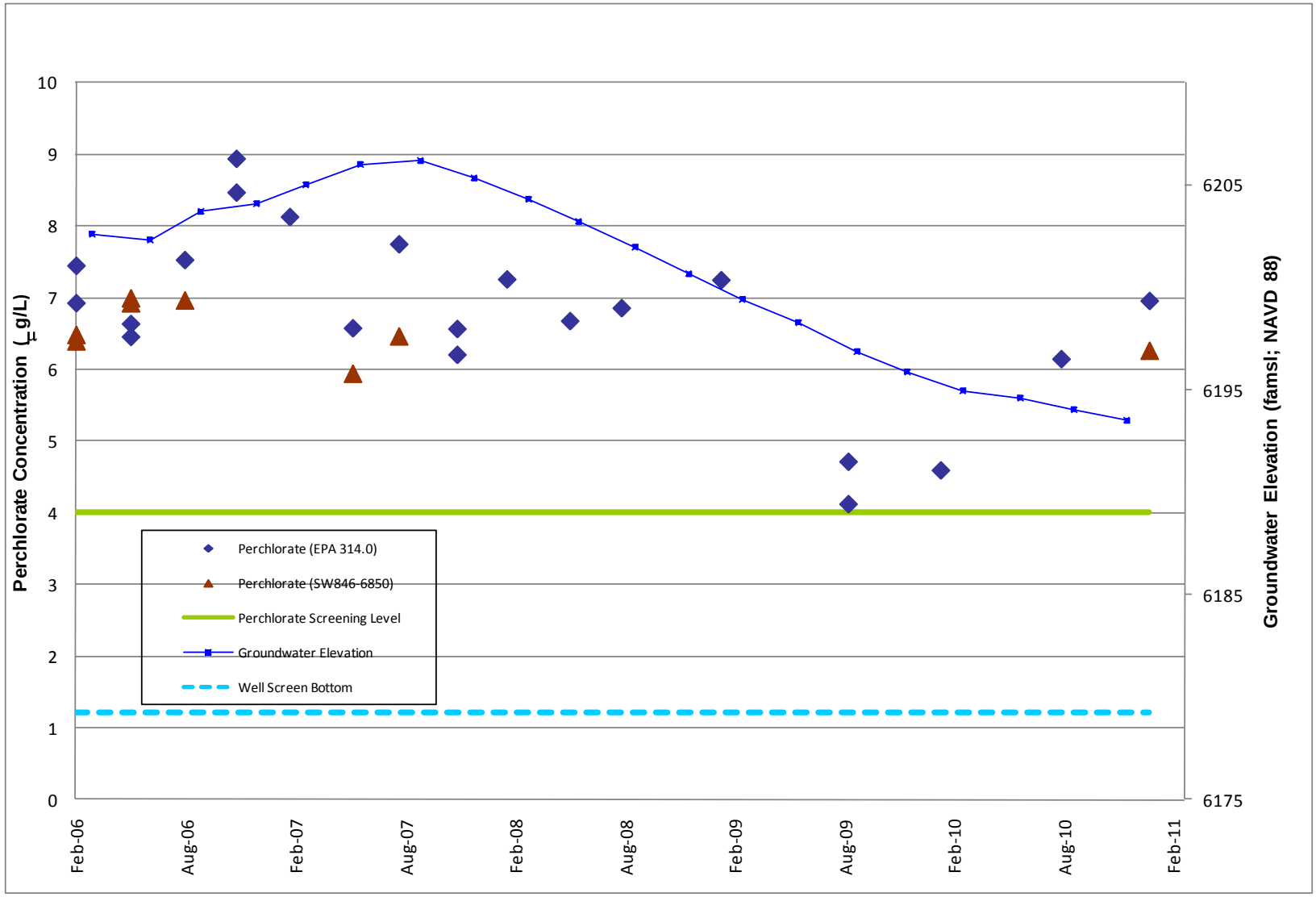

Figure 2
Groundwater Elevations and Perchlorate Concentrations Over Time in CYN-MW6

No variances or nonconformances in field activities or field conditions from requirements in the groundwater monitoring Mini-SAPs (SNL/NM December 2010b, January 2011, February 2011a, 2011b, and 2011c) were identified during the First Quarter of CY 2011 sampling activities.

5.0 Summary and Conclusions

Based on the analytical data presented in Table 3 and in previous reports, the following statements can be made:

- No perchlorate was detected in the environmental samples from groundwater monitoring wells CTF-MW1, CTF-MW2, CTF-MW3, CYN-MW5, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, TAV-MW11, TAV-MW12, TAV-MW13, or TAV-MW14 at the screening level/MDL of 4 µg/L.

- Since June 2004 (the start of sampling required by the Order), perchlorate has been detected above the screening level/MDL (4 µg/L) in samples from only one of the wells (CYN-MW6) in the perchlorate-screening monitoring well network.

- The analytical results for CYN-MW6 during the First Quarter of CY 2011 sampling event (6.95 and 6.26 µg/L) are consistent with the average concentration reported since the inception of sampling for perchlorate at CYN-MW6 in March 2006 (Figure 2).

- A human health risk assessment has been performed to evaluate the potential for adverse health effects from the concentrations of perchlorate detected in CYN-MW6 groundwater samples. The maximum concentration of perchlorate in CYN-MW6 samples to date (8.93 µg/L) was used in the assessment. The calculated HQ of 0.35 is less than the NMED target level of a hazard index (the sum of all HQs) of 1.0 (NMED June 2006 and SNL/NM March 2008).

DOE/Sandia will continue annual monitoring for perchlorate in CTF-MW1 and CYN-MW5, semiannual monitoring in CYN-MW6, and quarterly monitoring of perchlorate in CTF-MW2, CTF-MW3, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14.

6.0 References

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Sandia National Laboratories, New Mexico (SNL/NM), September 2009. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Second Quarter of Calendar Year 2009 (April 2009 through June 2009)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), November 2009. "Burn Site Groundwater Characterization Work Plan, Installation of Groundwater Monitoring Wells CYN-MW9, CYN-MW10, CYN-MW11, Collection of Subsurface Soil Samples, November 2009," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), December 2009. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2009 (July 2009 through September 2009)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), March 2010. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2009 (October, November, and December 2009)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), June 2010a. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, First Quarter of Calendar Year 2010 (January, February, and March 2010)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), June 2010b. "U.S. Department of Energy/Sandia Corporation Response to the New Mexico Environment Department letter of April 8, 2010 entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008) Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001*," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), September 2010. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Second Quarter of Calendar Year 2010 (April, May, and June 2010)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), December 2010a. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2010 (July, August, and September 2010)," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), December 2010b. "TA-V Mini-Sampling and Analysis Plan (SAP) for Second Quarter FY11," Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), January 2011. “Burn Site Groundwater Monitoring, Mini-Sampling and Analysis Plan (SAP) for Second Quarter, Fiscal Year 2011,” Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), February 2011a. “SWMU 49 and 116 Groundwater Monitoring, Mini-SAP for Fiscal Year 2011 Annual Sampling,” Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), February 2011b. “SWMU 149 Groundwater Monitoring, Mini-SAP for Second Quarter, Fiscal Year 2011,” Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), February 2011c. “SWMU 154 Groundwater Monitoring, Mini-SAP for Second Quarter, Fiscal Year 2011,” Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), March 2011. “Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2010 (October, November, and December),” Environmental Restoration Project, Sandia National Laboratories, New Mexico.

SNL/NM, see Sandia National Laboratories/New Mexico.

U.S. Environmental Protection Agency (EPA), November 1999. “Perchlorate in Drinking Water Using Ion Chromatography,” EPA 815/R-00-014.

Appendix A

Analytical Laboratory Certificates of Analysis for the Perchlorate Data

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 613444

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	3/7/11	Project/Task No.146422.10.11.01	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	134415	SMO Authorization:	
Project Name:	SWMU 49	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL		☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	SUB BOTTLE ORDER	Bill To:Sandia National Labs (Accounts Payable)
Service Order No.	CF 249-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				273503

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090227-001	CTF-MW1	261	NA	030711/0938	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090227-009	CTF-MW1	261	NA	030711/0939	GW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	002
090227-016	CTF-MW1	261	NA	030711/0940	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	003
090227-017	CTF-MW1	261	NA	030711/0941	FGW	P	250ml	HNO3	G	SA	Cations (SW846-6020/7470)	004
090227-018	CTF-MW1	261	NA	030711/0942	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	005
090227-020	CTF-MW1	261	NA	030711/0943	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	006
090227-022	CTF-MW1	261	NA	030711/0944	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	007
090227-024	CTF-MW1	261	NA	030711/0946	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	008
090227-027	CTF-MW1	261	NA	030711/0947	GW	P	500ml	NaOH	G	SA	Total Cyanide (SW846-9012)	009
090227-033	CTF-MW1	261	NA	030711/0948	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090227-034	CTF-MW1	261	NA	030711/0949	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
Alkalinity as total bicarbonate and carbonate
If perchlorate detected perform verification analysis (SW846-6850M)
Anions as Br,Fl,Cl,SO4
Cations as Ca,Mg,K,Na
FGW (filtered in field with .45 micron filter)

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 3/7/11	Time 1010	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4133	Date 3/7/11	Time 1010	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4133	Date 3/7/11	Time 1130	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 3/8/11	Time 0735	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613444

Project Name:	SWMU 49	Project/Task Manger:	Don Schofield	Project/Task No.:	146422.10.11.01
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090228-001	CTF-TB1	NA	NA	030711\0938	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	012
090229-001	CTF-FB1	NA	NA	030711\0917	DIW	G	3x40ml	HCL	G	FB	VOC (SW846-8260B)	013

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090227-020	Project:	SNLSGWater
Sample ID:	273503006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	07-MAR-11 09:43		
Receive Date:	08-MAR-11	Client Desc.:	CTF-MW1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1412	1082337	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab Batch No. N/A

SMO Use

AR/COC 613448

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped: 3/8/11	Project/Task No.98026.01.15
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No. 124439	SMO Authorization:
Project Name:	SWMU 154	Lab Contact: Edie Kent/803-556-8171	Contract # PO 691436
Record Center Code:	NA	Lab Destination: GEL	SOO BOTTLES ORDER
Logbook Ref. No.:	NA	SMO Contact/Phone: Pam Puissant/505-844-3185	
Service Order No.	CF 251-11	Send Report to SMO: Lorraine Herrera /505-844-3199	
Location	Tech Area		
Building	Room		

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:_____
☑ Validation Required

Bill To:Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

273600

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090237-001	CTF-MW2	132	NA	03/08/11 1007	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090237-002	CTF-MW2	132	NA	03/08/11 1009	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	002
090237-009	CTF-MW2	132	NA	03/08/11 1010	GW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	003
090237-010	CTF-MW2	132	NA	03/08/11 1011	FGW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	004
090237-016	CTF-MW2	132	NA	03/08/11 1012	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	005
090237-018	CTF-MW2	132	NA	03/08/11 1013	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	006
090237-020	CTF-MW2	132	NA	03/08/11 1014	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	007
090237-022	CTF-MW2	132	NA	03/08/11 1015	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	008
090237-024	CTF-MW2	132	NA	03/08/11 1017	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	009
090237-033	CTF-MW2	132	NA	03/08/11 1018	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090237-034	CTF-MW2	132	NA	03/08/11 1019	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	011

RMMA ☐ Yes ☑ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day
Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use
Date Entered(mm/dd/yy):
Entered by:
QC initls:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If Perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
Water has high buffering capacity,chech pH and add pres.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	Weston/4142/844-5130/228-0710
	William Gibson	William Gibson	WG	Weston/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 3/8/11	Time 1130	4.Relinquished by	Org.	Date	Time
1. Received by	[illegible]	Org. 4133	Date 3/8/11	Time 1130	4. Received by	Org.	Date	Time
2.Relinquished by	[illegible]	Org. 4133	Date 3/8/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by	[illegible]	Org. GEL	Date 3-9-11	Time 0830	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

up

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613448

Project Name:	SWMU 154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090237-035	CTF-MW2	132	NA	03/08/11 1020	GW	P	1 Liter	HNO3	G	SA	Isotopic Ur (ASTM D3972-09M)	012
090238-001	CTF-MW2	132	NA	03/08/11 1007	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	013
090238-002	CTF-MW2	132	NA	03/08/11 1009	GW	AG	4x1L	4C	G	DU	TCL SVOC (SW846-8270C)	014
090238-009	CTF-MW2	132	NA	03/08/11 1010	GW	P	500 ml	HNO3	G	DU	TAL Metals+ Ur (SW846-6020/7470)	015
090238-010	CTF-MW2	132	NA	03/08/11 1011	FGW	P	500 ml	HNO3	G	DU	TAL Metals+ Ur (SW846-6020/7470)	016
090238-016	CTF-MW2	132	NA	03/08/11 1012	GW	P	250ml	4C	G	DU	Anions (SW846-9056)	017
090238-018	CTF-MW2	132	NA	03/08/11 1013	GW	P	250ml	H2SO4	G	DU	NPN (353.2)	018
090238-020	CTF-MW2	132	NA	03/08/11 1014	GW	P	500ml	4C	G	DU	Perchlorate (314.0)	019
090238-022	CTF-MW2	132	NA	03/08/11 1015	GW	P	500ml	4C	G	DU	Alkalinity (SM2320B)	020
090238-024	CTF-MW2	132	NA	03/08/11 1017	GW	AG	4x1L	4C	G	DU	High Explosive (SW846-8321A) Mod.	021
090238-033	CTF-MW2	132	NA	03/08/11 1018	GW	P	1 Liter	HNO3	G	DU	Gamma Spec (short list)(901.0)	022
090238-034	CTF-MW2	132	NA	03/08/11 1019	GW	P	1 Liter	HNO3	G	DU	Gross Alpha/Beta (900.0)	023
090238-035	CTF-MW2	132	NA	03/08/11 1020	GW	P	1 Liter	HNO3	G	DU	Isotopic Ur (ASTM D3972-09M)	024
090239-001	CTF-TB5	NA	NA	03/08/11 1007	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	025
090240-001	CTF-FB2	NA	NA	03/08/11 0950	DIW	G	3x40ml	HCL	G	FB	VOC (SW846-8260B)	026

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 6, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090237-020	Project:	SNLSGWater
Sample ID:	273600007	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	08-MAR-11 10:14		
Receive Date:	09-MAR-11	Client Desc.:	CTF-MW2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1724	1081973	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 6, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090238-020	Project:	SNLSGWater
Sample ID:	273600019	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	08-MAR-11 10:14		
Receive Date:	09-MAR-11	Client Desc.:	CTF-MW2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1821	1081973	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 613450

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	3/9/11	Project/Task No. 98026.01.14	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	12451 4	SMO Authorization:	
Project Name:	SWMU-149	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL		☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF 250-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				273689

SMO BOTTLE ORDER

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090243-001	CTF-MW3	362	NA	030911\0959	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090243-009	CTF-MW3	362	NA	030911\1000	GW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	002
090243-010	CTF-MW3	362	NA	030911\1001	FGW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	003
090243-016	CTF-MW3	362	NA	030911\1002	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	004
090243-018	CTF-MW3	362	NA	030911\1003	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	005
090243-020	CTF-MW3	362	NA	030911\1004	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	006
090243-022	CTF-MW3	362	NA	030911\1005	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	007
090244-001	CTF-MW3	362	NA	030911\0959	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	008
090244-009	CTF-MW3	362	NA	030911\1000	GW	P	500 ml	HNO3	G	DU	TAL Metals (SW846-6020/7470)	009
090244-010	CTF-MW3	362	NA	030911\1001	FGW	P	500 ml	HNO3	G	DU	TAL Metals (SW846-6020/7470)	010
090244-016	CTF-MW3	362	NA	030911\1002	GW	P	250ml	4C	G	DU	Anions (SW846-9056)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cellular
Robert Lynch		RL	Weston/4142/844-4013/250-7090
Alfred Santillanes			Weston/4142/844-5130/228-0710
William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 3/9/11	Time 1118	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 3/9/11	Time 1118	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 3/9/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 3/10/11	Time ~~0900~~ 0805	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613450

Project Name:	SWMU-149	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.14
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090244-018	CTF-MW3	362	NA	030911\1003	GW	P	250ml	H2SO4	G	DU	NPN (353.2)	012
090244-020	CTF-MW3	362	NA	030911\1004	GW	P	500ml	4C	G	DU	Perchlorate (314.0)	013
090244-022	CTF-MW3	362	NA	030911\1005	GW	P	500ml	4C	G	DU	Alkalinity (SM2320B)	014
090245-001	CTF-TB7	NA	NA	030911\0959	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	015
090246-001	CTF-FB3	NA	NA	030911\0944	DIW	G	3x40ml	HCL	G	FB	VOC (SW846-8260B)	016

Abnormal Conditions on Receipt

LAB USE

Recipient Initials: [illegible]

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090243-020	Project:	SNLSGWater
Sample ID:	273689006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	09-MAR-11 10:04		
Receive Date:	10-MAR-11	Client Desc.:	CTF-MW3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1900	1081973	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090244-020	Project:	SNLSGWater
Sample ID:	273689013	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	09-MAR-11 10:04		
Receive Date:	10-MAR-11	Client Desc.:	CTF-MW3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1919	1081973	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

AR/COC **613446**

Dept. No./Mail Stop:	4142/1126	SMO Use: Date Samples Shipped:	3/10/11	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	124577	SMO Authorization: SMO	-Send preliminary/copy report to:
Project Name:	SWMU 49	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	SEE BOTTLE ORDER	☑ Validation Required
Service Order No.	CF 249-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				273503
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090232-001	CYN-MW5	156	NA	031011\0946	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	014
090232-009	CYN-MW5	156	NA	031011\0947	GW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	015
090232-016	CYN-MW5	156	NA	031011\0948	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	016
090232-017	CYN-MW5	156	NA	031011\0949	FGW	P	250ml	HNO3	G	SA	Cations (SW846-6020/7470)	017
090232-018	CYN-MW5	156	NA	031011\0950	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	018
090232-020	CYN-MW5	156	NA	031011\0951	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	019
090232-022	CYN-MW5	156	NA	031011\0952	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	020
090232-024	CYN-MW5	156	NA	031011\0954	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	021
090232-027	CYN-MW5	156	NA	031011\0955	GW	P	500ml	NaOH	G	SA	Total Cyanide (SW846-9012)	022
090232-033	CYN-MW5	156	NA	031011\0956	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	023
090232-034	CYN-MW5	156	NA	031011\0957	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	~~023~~ 024

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use: Date Entered(mm/dd/yy): Entered by: QC inits:

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/ORG.4142/MS.0729/ 284-2547

Alkalinity as total bicarbonate and carbonate

If perchlorate detected perform verification analysis (SW846-6850M)

Anions as Br,Fl,Cl,SO4

Cations as Ca,Mg,K,Na

FGW (filtered in field with .45 micron filter)

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch			Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 3/10/11	Time 1050	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 3/10/11	Time 1050	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 3/10/11	Time 1138	5.Relinquished by	Org.	Date	Time
2. Received by		Org. Cor	Date 3-11-11	Time 0745	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613446

Project Name:	SWMU 49	Project/Task Manger:	Don Schofield	Project/Task No.:	146422.10.11.01
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090233-001	CYN-MW5	156	NA	031011\0946	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	025
090233-009	CYN-MW5	156	NA	031011\0947	GW	P	500 ml	HNO3	G	DU	TAL Metals+ Ur (SW846-6020/7470)	026
090233-016	CYN-MW5	156	NA	031011\0948	GW	P	250ml	4C	G	DU	Anions (SW846-9056)	027
090233-017	CYN-MW5	156	NA	031011\0949	FGW	P	250ml	HNO3	G	DU	Cations (SW846-6020/7470)	028
090233-018	CYN-MW5	156	NA	031011\0950	GW	P	250ml	H2SO4	G	DU	NPN (353.2)	029
090233-020	CYN-MW5	156	NA	031011\0951	GW	P	500ml	4C	G	DU	Perchlorate (314.0)	030
090233-022	CYN-MW5	156	NA	031011\0952	GW	P	500ml	4C	G	DU	Alkalinity (SM2320B)	031
090233-024	CYN-MW5	156	NA	031011\0954	GW	AG	4x1L	4C	G	DU	High Explosive (SW846-8321A) Mod.	032
090233-027	CYN-MW5	156	NA	031011\0955	GW	P	500ml	NaOH	G	DU	Total Cyanide (SW846-9012)	033
090233-033	CYN-MW5	156	NA	031011\0956	GW	P	1 Liter	HNO3	G	DU	Gamma Spec (short list)(901.0)	034
090233-034	CYN-MW5	156	NA	031011\0957	GW	P	1 Liter	HNO3	G	DU	Gross Alpha/Beta (900.0)	035
090234-001	CTF-TB3	NA	NA	031011\0946	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	036

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

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

Certificate of Analysis

Report Date: April 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090232-020	Project:	SNLSGWater
Sample ID:	273503019	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-MAR-11 09:51		
Receive Date:	11-MAR-11	Client Desc.:	CYN-MW5
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1510	1082337	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Certificate of Analysis

Report Date: April 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090233-020	Project:	SNLSGWater
Sample ID:	273503030	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-MAR-11 09:51		
Receive Date:	11-MAR-11	Client Desc.:	CYN-MW5
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	03/16/11	1529	1082337	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613413

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	2/14/11	Project/Task No. 146422.10.11.01	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	123501	SMO Authorization:	
Project Name:	Burn Site GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	☐ Released by COC No.:
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF#058-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				272223

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090000-005	CYN-MW6	163	NA	02/14/11 0908	GW	AG	4x1 L	4C	G	SA	TPH DRO (SW846-8015A/B) SVOC	001
090000-006	CYN-MW6	163	NA	02/14/11 0910	GW	AG	3x40 ml	4C	G	SA	TPH GRO (SW846-8015A/B) VOC	002
090000-018	CYN-MW6	163	NA	02/14/11 0911	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	003
090000-020	CYN-MW6	163	NA	02/14/11 0912	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	004
090005-001	CYN-TB15	NA	NA	02/14/11 0910	DIW	AG	3x40 ml	4C	G	TB	TPH GRO (SW846-8015A/B) VOC	005

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by

QC Inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/Org.4142/MS 0729/505-284-2547

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson		WJG	Weston/4133/844-4013/239-7367
	Robert Lynch		RL	Weston/4133/844-4013/250-7090
	Alfred Santillanes			Weston/4133/844-5130/228-0710

1.Relinquished by	Org. 4133	Date 2/14/11	Time 0955	4.Relinquished by	Org.	Date	Time
1. Received by	Org. 4133	Date 2/14/11	Time 0955	4. Received by	Org.	Date	Time
2.Relinquished by	Org. 4133	Date 2/14/11	Time 1200	5.Relinquished by	Org.	Date	Time
2. Received by	Org. GEL	Date 2-15-11	Time 0730	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 9, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090000-020	Project:	SNLSGWater
Sample ID:	272223004	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	14-FEB-11 09:12		
Receive Date:	15-FEB-11	Client Desc.:	CYN-MW6
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	J	0.00695	0.004	0.012	mg/L	1	MAR1	02/24/11	1544	1073831	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 31, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090000-R20	Project:	SNLSGWater
Sample ID:	274124001	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	14-FEB-11 09:12		
Receive Date:	15-FEB-11	Client Desc.:	CYN-MW6
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
LC-MS/MS Perchlorate											
Perchlorate by LC-MS/MS "As Received"											
Perchlorate	Hh	6.26	0.500	2.00	ug/L	10	MAP	03/23/11	1802	1084247	1
Perchlorate Isotope Ratio	Hh	2.92			num	10					
Perchlorate-101	Hh	6.15	0.500	2.00	ug/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 6850 Modified	EPA 6850 Perchlorate Extraction in Liquid	MAP	03/21/11	1418	1084246

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 6850 Modified	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 613414

Dept. No./Mail Stop:	6234/0719	Date Samples Shipped:	2/15/11	Project/Task No.98026.01.06	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	John Cochran	Carrier/Waybill No.	123647	SMO Authorization:	
Project Name:	Burn Site GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	☐ Released by COC No.:
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SMO	☑ Validation Required
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185	SMO BOTTLE ORDER	Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF#235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154 272333
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090006-001	CYN-MW9	196	NA	021511\1005	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090006-002	CYN-MW9	196	NA	021511\1007	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
090006-005	CYN-MW9	196	NA	021511\1009	GW	AG	4x1 L	4C	G	SA	TPH DRO (SW846-8015A/B) SVOC	003
090006-006	CYN-MW9	196	NA	021511\1010	GW	AG	3x40 ml	4C	G	SA	TPH GRO (SW846-8015A/B) VOC	004
090006-018	CYN-MW9	196	NA	021511\1011	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	005
090006-020	CYN-MW9	196	NA	021511\1012	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	006
090006-024	CYN-MW9	196	NA	021511\1014	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A) Mod.	007
090007-001	CYN-TB16	NA	NA	021511\1005	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	008
090007-006	CYN-TB17	NA	NA	021511\1010	DIW	AG	3x40 ml	4C	G	TB	TPH GRO (SW846-8015A/B) VOC	009
090008-001	CYN-FB2	NA	NA	021511\0933	DIW	G	3x40 ml	HCL	G	FB	TCL VOC (SW846-8260B)	010

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by	
Return Samples By:	☐ Negotiated TAT	QC Inits	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0729/505-284-2547
If Perchlorate detected,perform verification analysis using SW846-6850M
Last well in Burn Site project of 2nd Qtr.
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson			Weston/4133/844-4013/239-7367
	Robert Lynch			Weston/4133/844-4013/250-7090
	Alfred Santillanes			Weston/4133/844-5130/228-0710

1.Relinquished by		Org. 4133	Date 2/15/11	Time 1045	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4133	Date 2/15/11	Time 1045	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4133	Date 2/15/11	Time 1155	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 2/16/11	Time 0725	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613414

Project Name:	Burn Site GWM	Project/Task Manger:	John Cochran	Project/Task No.:	98026.01.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090008-006	CYN-FB3	NA	NA	021511\0934	DIW	AG	3x40 ml	4C	G	FB	TPH GRO (SW846-8015A/B) VOC	011

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 9, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090006-020	Project:	SNLSGWater
Sample ID:	272333006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	15-FEB-11 10:12		
Receive Date:	16-FEB-11	Client Desc.:	CYN-MW9
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	02/24/11	1603	1073831	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab Batch No. N/A

SMO Use

AR/COC 613411

Dept. No./Mail Stop:	6234/0719	Date Samples Shipped:	2-9-11	Project/Task No.98026.01.06	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	John Cochran	Carrier/Waybill No:	123392	SMO Authorization:	
Project Name:	Burn Site GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436 SMO	☐ Released by COC No.:
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SUB BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 272046
Service Order No.	CF#235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089994-001	CYN-MW10	171	NA	020911\1039	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
089994-002	CYN-MW10	171	NA	020911\1042	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
089994-005	CYN-MW10	171	NA	020911\1046	GW	AG	4x1 L	4C	G	SA	TPH DRO (SW846-8015A/B) SVOC	003
089994-006	CYN-MW10	171	NA	020911\1050	GW	AG	3x40 ml	4C	G	SA	TPH GRO (SW846-8015A/B) VOC	004
089994-018	CYN-MW10	171	NA	020911\1051	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	005
089994-020	CYN-MW10	171	NA	020911\1052	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	006
089994-024	CYN-MW10	171	NA	020911\1053	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A) Mod.	007
089995-001	CYN-TB11	NA	NA	020911\1039	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	008
089996-001	CYN-TB12	NA	NA	020911\1050	DIW	AG	3x40 ml	4C	G	TB	TPH GRO (SW846-8015A/B) VOC	009

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Smo Use: Date Entered(mm/dd/yy): Entered by: QC Inits:

Special Instructions/QC Requirements: EDD ☑ Yes ☐ No; Level D Package ☐ Yes ☑ No

*Send report to: Tim Jackson/Org.4142/MS 0729/505-284-2547

If Perchlorate detected,perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson			Weston/4142/844-4013/239-7367
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Tim Jackson		TJ	Gram/4142/284-2547

1.Relinquished by		Org. 4142	Date 2/9/11	Time 1119	4.Relinquished by	Org.	Date	Time
1. Received by	SWW	Org. 4133	Date 2/9/11	Time 1119	4. Received by	Org.	Date	Time
2.Relinquished by	SWW	Org. 4133	Date 2/9/11	Time 1240	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 2-10-11	Time 0940	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 9, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	089994-020	Project:	SNLSGWater
Sample ID:	272046006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	09-FEB-11 10:52		
Receive Date:	10-FEB-11	Client Desc.:	CYN-MW10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	02/24/11	1427	1073831	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

ORIGINAL

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab

Batch No. NA

SMO Use

AR/COC 613410

Dept. No./Mail Stop:	6234/0719	Date Samples Shipped:	7-8-11	Project/Task No.98026.01.06	☐ Waste Characterization
Project/Task Manager:	John Cochran	Carrier/Waybill No:	123 3 07	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	Burn Site GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL		☐ Released by COC No.:_____
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CF#235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

SMO

5 00 BOTTLE ONLY

271917

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089990-001	CYN-MW11	252	NA	020811\1021	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
089990-002	CYN-MW11	252	NA	020811\1023	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
089990-005	CYN-MW11	252	NA	020811\1030	GW	AG	4x1 L	4C	G	SA	TPH DRO (SW846-8015A/B) SVOC	003
089990-006	CYN-MW11	252	NA	020811\1035	GW	AG	3x40 ml	4C	G	SA	TPH GRO (SW846-8015A/B) VOC	004
089990-018	CYN-MW11	252	NA	020811\1037	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	005
089990-020	CYN-MW11	252	NA	020811\1039	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	006
089990-024	CYN-MW11	252	NA	020811\1042	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A) Mod.	007
089991-001	CYN-MW11	252	NA	020811\1021	GW	G	3x40 ml	HCL	G	DU	TCL VOC (SW846-8260B)	008
089991-002	CYN-MW11	252	NA	020811\1023	GW	AG	4x1 L	4C	G	DU	SVOC (SW846-8270)	009
089991-005	CYN-MW11	252	NA	020811\1030	GW	AG	4x1 L	4C	G	DU	TPH DRO (SW846-8015A/B) SVOC	010

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by:

QC Inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/Org.4142/MS 0729/505-284-2547

If Perchlorate detected, perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Tim Jackson	T. Jackson	TJ	Gram/4142/284-2547
	Robert Lynch	R. Lynch	RL	Weston/4142/844-4013/250-7090

1.Relinquished by T. Jackson	Org. 4142	Date 2/4/11	Time 1145	4.Relinquished by	Org.	Date	Time
1. Received by	Org. 4173	Date 7-8-11	Time 1145	4. Received by	Org.	Date	Time
2.Relinquished by	Org. 4173	Date 7-8-11	Time 1245	5.Relinquished by	Org.	Date	Time
2. Received by	Org. GEL	Date 2-9-11	Time 0745	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613410

Project Name:	Burn Site GWM	Project/Task Manger:	John Cochran	Project/Task No.:	98026.01.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
089991-006	CYN-MW11	252	NA	020811\1035	GW	AG	3x40 ml	4C	G	DU	TPH GRO (SW846-8015A/B) VOC	011
089991-018	CYN-MW11	252	NA	020811\1037	GW	P	250 ml	H2SO4	G	DU	NPN (353.2)	012
089991-020	CYN-MW11	252	NA	020811\1039	GW	P	500 ml	4C	G	DU	Perchlorate (314.0)	013
089991-024	CYN-MW11	252	NA	020811\1042	GW	AG	4x1 L	4C	G	DU	High Explosives (SW846-8321A) Mod.	014
089992-001	CYN-TB9	NA	NA	020811\1021	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	015
089993-001	CYN-TB10	NA	NA	020811\1035	DIW	AG	3x40 ml	4C	G	TB	TPH GRO (SW846-8015A/B) VOC	016

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date:	March 9, 2011
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123		
Contact:	Ms. Pamela M. Puissant		
Project:	Level C, Groundwater Monitoring		

Client Sample ID:	089990-020	Project:	SNLSGWater
Sample ID:	271917006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	08-FEB-11 10:39		
Receive Date:	09-FEB-11	Client Desc.:	CYN-MW11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 02/10/11	1447	1072966	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date:	March 9, 2011
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123		
Contact:	Ms. Pamela M. Puissant		
Project:	Level C, Groundwater Monitoring		

Client Sample ID:	089991-020	Project:	SNLSGWater
Sample ID:	271917013	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	08-FEB-11 10:39		
Receive Date:	09-FEB-11	Client Desc.:	CYN-MW11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 02/10/11	1545	1072966	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab Batch No. N/A

SMO Use

AR/COC 613412

Dept. No./Mail Stop:	6234/0719	Date Samples Shipped:	2/10/11	Project/Task No.98026.01.06	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	John Cochran	Carrier/Waybill No:	123459	SMO Authorization:	
Project Name:	Burn Site GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	☐ Released by COC No.:_____
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SMO BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Service Order No.	CF#235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		272046
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089997-001	CYN-MW12	274	NA	02/10/11\1025	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	010
089997-002	CYN-MW12	274	NA	02/10/11\1027	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	011
089997-005	CYN-MW12	274	NA	02/10/11\1031	GW	AG	4x1 L	4C	G	SA	TPH DRO (SW846-8015A/B) SVOC	012
089997-006	CYN-MW12	274	NA	02/10/11\1035	GW	AG	3x40 ml	4C	G	SA	TPH GRO (SW846-8015A/B) VOC	013
089997-018	CYN-MW12	274	NA	02/10/11\1037	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	014
089997-020	CYN-MW12	274	NA	02/10/11\1038	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	015
089997-024	CYN-MW12	274	NA	02/10/11\1039	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A) Mod.	016
089998-001	CYN-TB13	NA	NA	02/10/11\1025	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	017
089999-001	CYN-TB14	NA	NA	02/10/11\1035	DIW	AG	3x40 ml	4C	G	TB	TPH GRO (SW846-8015A/B) VOC	018

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC Inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0729/505-284-2547
If Perchlorate detected,perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson	[signature]	WJG	Weston/4133/844-4013/239-7367
	Tim Jackson	[signature]	TJ	Gram/4142/284-2547

1.Relinquished by	[signature]	Org. 4142	Date 2/10/11	Time 1111	4.Relinquished by	Org.	Date	Time
1. Received by	[signature] SMO	Org. 4133	Date 2/10/11	Time 1111	4. Received by	Org.	Date	Time
2.Relinquished by	[signature] SMO	Org. 4133	Date 2/10/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by	[signature]	Org. GEL	Date 2-11-11	Time 0845	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 9, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	089997-020	Project:	SNLSGWater
Sample ID:	272046015	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-FEB-11 10:38		
Receive Date:	11-FEB-11	Client Desc.:	CYN-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	02/24/11	1525	1073831	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.

SMO Use

98026.01.10 2/4/11

AR/COC 613384

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1-6-11	Project/Task No. ~~98026.01.10~~ 503	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Don Schofield	Carrier/Waybill No:	122123	SMO Authorization: GB SMO	
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CFO 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 269961
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089917-001	TAV-MW11	531	NA	01/06/11 0951	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	001
089917-004	TAV-MW11	531	NA	01/06/11 0952	GW	AG	250 ml	H2SO4	G	SA	TOC (SW846-9060)	002
089917-010	TAV-MW11	531	NA	01/06/11 0953	FGW	P	500 ml	HNO3	G	SA	Metals-Fe,Mn (SW846-6020)	003
089917-016	TAV-MW11	531	NA	01/06/11 0954	GW	P	250 ml	4C	G	SA	Anions (SW846-9056)	004
089917-017	TAV-MW11	531	NA	01/06/11 0955	GW	P	250 ml	HNO3	G	SA	Metals/Cations (SW846-6020)	005
089917-018	TAV-MW11	531	NA	01/06/11 0956	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	006
089917-020	TAV-MW11	531	NA	01/06/11 0957	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	007
089917-022	TAV-MW11	531	NA	01/06/11 0958	GW	P	250 ml	4C	G	SA	Alkalinity (SM2320B)	008
089917-023	TAV-MW11	531	NA	01/06/11 1000	GW	P	1-L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	009
089918-001	TAV-TB4	NA	NA	01/06/11 0951	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	010

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	
Return Samples By:	☐ Negotiated TAT	QC Inits	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG. 4142/MS.0729/ 284-2547
FGW (Filtered in field w/40 micron filter)
Anions (Cl,SO4)
Cations (Ca,Mg,K,Na)
Alkalinity (total,bicarbonate,carbonate)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/844-4013/250-7090
	Alfred Santillanes		AS	Weston/4133/844-5130/228-0710
	William J. Gibson		WG	Weston/4133/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 1/6/11	Time 1108	4.Relinquished by	Org.	Date	Time
1. Received by		Org. 4139	Date 1-6-11	Time 1108	4. Received by	Org.	Date	Time
2.Relinquished by		Org. 4139	Date 1-6-11	Time 1:00	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 1-7-11	Time 0730	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date: January 28, 2011	
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123		
Contact:	Ms. Pamela M. Puissant		
Project:	Level C, Groundwater Monitoring		

Client Sample ID:	089917-020	Project:	SNLSGWater
Sample ID:	269961007	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	06-JAN-11 09:57		
Receive Date:	07-JAN-11	Client Desc.:	TAV-MW11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 01/19/11	1622	1064658	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 613392

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/19/11	Project/Task NO.98026.01.10	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	1226/5	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	See Below Order	☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 270718%

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089935-001	TAV-MW12	529	NA	011911\1024	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	001
089935-004	TAV-MW12	529	NA	011911\1025	GW	AG	250 ml	H2SO4	G	SA	TOC (SW846-9060)	002
089935-010	TAV-MW12	529	NA	011911\1026	FGW	P	500 ml	HNO3	G	SA	Metals-Fe,Mn (SW846-6020)	003
089935-016	TAV-MW12	529	NA	011911\1027	GW	P	250 ml	4C	G	SA	Anions (SW846-9056)	004
089935-017	TAV-MW12	529	NA	011911\1028	GW	P	250 ml	HNO3	G	SA	Metals/Cations (SW846-6020)	005
089935-018	TAV-MW12	529	NA	011911\1029	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	006
089935-020	TAV-MW12	529	NA	011911\1030	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	007
089935-022	TAV-MW12	529	NA	011911\1031	GW	P	250 ml	4C	G	SA	Alkalinity (SM2320B)	008
089935-023	TAV-MW12	529	NA	011911\1032	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	009
089936-001	TAV-TB12	NA	NA	011911\1024	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	010
089937-001	TAV-FB2	NA	NA	011911\0950	DIW	G	3x40 ml	HCL	G	FB	TCL VOC (SW846-8260)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC Inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG. 4142/MS.0729/ 284-2547
FGW (Filtered in field w/40 micron filter)
Anions (Cl,SO4)
Cations (Ca,Mg,K,Na)
Alkalinity (total,bicarbonate,carbonate)
*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4133/844-4013/250-7090
	William J. Gibson	William J. Gibson	WJG	Weston/4133/844-4013/239-7367

1.Relinquished by	Robert Lynch	Org. 4133	Date 1/19/11	Time 1105	4.Relinquished by	Org.	Date	Time
1. Received by	[illegible] SMO	Org. 4133	Date 1/19/11	Time 1105	4. Received by	Org.	Date	Time
2.Relinquished by	[illegible] SMO	Org. 4133	Date 1/19/11	Time 1310	5.Relinquished by	Org.	Date	Time
2. Received by	[illegible]	Org. GEL	Date 1-20-11	Time 0725	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date: February 16, 2011
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123	
Contact:	Ms. Pamela M. Puissant	
Project:	Level C, Groundwater Monitoring	

Client Sample ID:	089935-020	Project:	SNLSGWater
Sample ID:	270718007	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	19-JAN-11 10:30		
Receive Date:	20-JAN-11	Client Desc.:	TAV-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 01/27/11	1645	1067273	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab: N/A

Batch No.

SMO Use

AR/COC 613386

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/10/1760	Project/Task No. 98026.01.10	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.		SMO Authorization:	-Send preliminary/copy report to:
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	SMO BOTTLE ORDER	☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 270138
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089921-001	TAV-MW13	547	NA	011011\1014	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	001
089921-004	TAV-MW13	547	NA	011011\1015	GW	AG	250 ml	H2SO4	G	SA	TOC (SW846-9060)	002
089921-010	TAV-MW13	547	NA	011011\1016	FGW	P	500 ml	HNO3	G	SA	Metals-Fe,Mn (SW846-6020)	003
089921-016	TAV-MW13	547	NA	011011\1017	GW	P	250 ml	4C	G	SA	Anions (SW846-9056)	004
089921-017	TAV-MW13	547	NA	011011\1018	GW	P	250 ml	HNO3	G	SA	Metals/Cations (SW846-6020)	005
089921-018	TAV-MW13	547	NA	011011\1019	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	006
089921-020	TAV-MW13	547	NA	011011\1020	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	007
089921-022	TAV-MW13	547	NA	011011\1021	GW	P	250 ml	4C	G	SA	Alkalinity (SM2320B)	008
089921-023	TAV-MW13	547	NA	011011\1023	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	009
089922-001	TAV-MW13	547	NA	011011\1014	GW	G	3x40 ml	HCL	G	DU	TCL VOC (SW846-8260)	010
089922-004	TAV-MW13	547	NA	011011\1015	GW	AG	250 ml	H2SO4	G	DU	TOC (SW846-9060)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking: Smo Use
Date Entered(mm/dd/yy):
Entered by:
QC Init:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG. 4142/MS.0729/ 284-2547
FGW (Filtered in field w/40 micron filter)
Anions (Cl,SO4)
Cations (Ca,Mg,K,Na)
Alkalinity (total,bicarbonate,carbonate)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cellular
Robert Lynch		RL	Weston/4133/844-4013/250-7090
Alfred Santillanes		AS	Weston/4133/844-5130/228-0710
William J. Gibson		WJG	Weston/4133/844-4013/239-7367

1.Relinquished by	Org. 4133	Date 1/10/11	Time 1110	4.Relinquished by	Org.	Date	Time
1. Received by	SMO Org. 4133	Date 1/10/11	Time 1110	4. Received by	Org.	Date	Time
2.Relinquished by	SMO Org. 4133	Date 1/10/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by	Org. GEL	Date 1-11-11	Time 0800	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613386

Project Name:	TA-V GWM	Project/Task Manger:	Don Schofield	Project/Task No.:	98026.01.10
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
089922-010	TAV-MW13	547	NA	011011\1016	FGW	P	500 ml	HNO3	G	DU	Metals-Fe,Mn (SW846-6020)	012 .3
089922-016	TAV-MW13	547	NA	011011\1017	GW	P	250 ml	4C	G	DU	Anions (SW846-9056)	013 .4
089922-017	TAV-MW13	547	NA	011011\1018	GW	P	250 ml	HNO3	G	DU	Metals/Cations (SW846-6020)	014 .5
089922-018	TAV-MW13	547	NA	011011\1019	GW	P	250 ml	H2SO4	G	DU	NPN (353.2)	015 .6
089922-020	TAV-MW13	547	NA	011011\1020	GW	P	500 ml	4C	G	DU	Perchlorate (314.0)	016 .7
089922-022	TAV-MW13	547	NA	011011\1021	GW	P	250 ml	4C	G	DU	Alkalinity (SM2320B)	017 .8
089922-023	TAV-MW13	547	NA	011011\1023	GW	P	1 L	NaOH-Zn	G	DU	Sulfide (SW846-9034)	018 .9
089923-001	TAV-TB6	NA	NA	011011\1014	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	019 .1

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date: February 8, 2011
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123	
Contact:	Ms. Pamela M. Puissant	
Project:	Level C, Groundwater Monitoring	

Client Sample ID:	089921-020	Project:	SNLSGWater
Sample ID:	270138007	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-JAN-11 10:20		
Receive Date:	11-JAN-11	Client Desc.:	TAV-MW13
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 01/19/11	1738	1064658	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date: February 8, 2011	
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123		
Contact:	Ms. Pamela M. Puissant		
Project:	Level C, Groundwater Monitoring		

Client Sample ID:	089922-020	Project:	SNLSGWater
Sample ID:	270138016	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-JAN-11 10:20		
Receive Date:	11-JAN-11	Client Desc.:	TAV-MW13
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 01/19/11	1758	1064658	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 613393

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/20/2011	Project/Task No. 98026.01.10	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	122672	SMO Authorization:	
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436 SMO	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	SOW BOTTLE ORDER	☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room				2707189

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
089938-001	TAV-MW14	535	NA	012011\1032	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	012
089938-004	TAV-MW14	535	NA	012011\1033	GW	AG	250 ml	H2SO4	G	SA	TOC (SW846-9060)	013
089938-010	TAV-MW14	535	NA	012011\1034	FGW	P	500 ml	HNO3	G	SA	Metals-Fe,Mn (SW846-6020)	014
089938-016	TAV-MW14	535	NA	012011\1035	GW	P	250 ml	4C	G	SA	Anions (SW846-9056)	015
089938-017	TAV-MW14	535	NA	012011\1036	GW	P	250 ml	HNO3	G	SA	Metals/Cations (SW846-6020)	016
089938-018	TAV-MW14	535	NA	012011\1037	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	017
089938-020	TAV-MW14	535	NA	012011\1038	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	018
089938-022	TAV-MW14	535	NA	012011\1039	GW	P	250 ml	4C	G	SA	Alkalinity (SM2320B)	019
089938-023	TAV-MW14	535	NA	012011\1041	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	020
089939-001	TAV-TB13	NA	NA	012011\1032	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	021

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking: Smo Use
Date Entered(mm/dd/yy):
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG. 4142/MS.0729/ 284-2547
FGW (Filtered in field w/40 micron filter)
Anions (Cl,SO4)
Cations (Ca,Mg,K,Na)
Alkalinity (total,bicarbonate,carbonate)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

QC Inits:

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/844-4013/250-7090
	Alfred Santillanes		AS	Weston/4133/844-5130/228-0710
	William J. Gibson			Weston/4133/844-4013/239-7367

1.Relinquished by		Org. 4177	Date 1/20/11	Time 1170	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4177	Date 1/20/11	Time 1170	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4177	Date 1/20/11	Time 1225	5.Relinquished by	Org.	Date	Time
2. Received by		Org. OAL	Date 1-21-11	Time 0915	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

Company :	Sandia National Laboratories	Report Date: February 16, 2011
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123	
Contact:	Ms. Pamela M. Puissant	
Project:	Level C, Groundwater Monitoring	

Client Sample ID:	089938-020	Project:	SNLSGWater
Sample ID:	270718018	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	20-JAN-11 10:38		
Receive Date:	21-JAN-11	Client Desc.:	TAV-MW14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
EPA 314.0 Perchlorate by IC "As Received"										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 01/27/11	1742	1067273	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

Appendix B

Data Validation Sample Findings Summary Sheets for the Perchlorate Data

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: February 20, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TAV Drilling
AR/COC(s): 613384 and 613385
SDG: 269961
Laboratory: GEL
Project/Task No: 98026.01.10

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9034 (total sulfide), EPA 9056 (anions), EPA 9060 (TOC), and SM 2320B (total alkalinity). Problems were identified with the data package that result in the qualification of data.

Nitrate/nitrite Analysis:

Dilutions: Sample 269961-016 was diluted 5X for nitrate/nitrite and the relative dilution factors between the sample and the MS and replicate QC samples were >5. The associated sample result was a non-detect (ND) and will be qualified "UJ,MS1,RP1" due to lack of matrix-specific accuracy and precision information.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

TOC Analysis: No target analytes were detected in the blanks, except the following. TOC (average) was detected in the equipment blank (EB), sample -012, at a concentration > the method detection limit (MDL) but ≤ the practical quantitation limit (PQL). However, the result of the EB only applies to samples on AR/COC# 613386, contained in another SDG.

Anions Analysis: No target analytes were detected in the blanks, except the following. Chloride was detected in the continuing calibration blank (CCB), associated with sample -004, at a concentration > the MDL but ≤ the PQL. The associated sample result was a detect >5X the CCB concentration and will not be qualified. Chloride and sulfate were detected in the EB, sample -014, at concentrations > the MDL but ≤ the PQL. However, the results of the EB only apply to samples on AR/COC# 613386, contained in another SDG.

Total Alkalinity Analysis: No target analytes were detected in the blanks, except the following. bicarbonate alkalinity was detected in the EB, sample -018, at a concentration > the practical PQL. However, the result of the EB only applies to samples on AR/COC# 613386, contained in another SDG.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Analyses: All MS (PS) QC acceptance criteria were met. It should be noted that the MS (PS) analyses for the anions, nitrate/nitrite, total sulfide, and total alkalinity analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Replicates

All Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analyses for the anions, nitrate/nitrite, total sulfide, and total alkalinity analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Sample -004 was diluted 5X for chloride and sulfate due to high concentrations of the target analytes. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Sample -006 was diluted 50X for nitrate/nitrite due to high concentration of the target analyte and sample -016 was diluted 5X for nitrate/nitrite due to matrix interference. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X, except as noted above in the summary section. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No field blanks (FBs) or field duplicates (FDs) were submitted on the AR/COC(s). It should be noted that the EBs on AR/COC# 613385 are associated with the samples on AR/COC# 613386, contained in another SDG.

No other specific issues were identified that affect data quality.

Sample Findings Summary

AR/COC: 613384, 613385

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 353.2			
	089919-018/TAV-EB2	Nitrogen, Nitrate/Nitrite ()	UJ, MS1,RP1
SW846 8260B DOE-AL			
	089919-001/TAV-EB2	Chloromethane (74-87-3)	J+, MS2

All other analyses met QC acceptance criteria; no further data should be qualified.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: February 22, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TAV Drilling
AR/COC(s): 613386
SDG: 270138
Laboratory: GEL
Project/Task No: 98026.01.10

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9034 (total sulfide), EPA 9056 (anions), EPA 9060 (TOC), and SM 2320B (total alkalinity). Problems were identified with the data package that result in the qualification of data.

TOC Analysis:

Blanks: In the equipment blank (EB), sample 269961-012, associated with all the samples, TOC (average) was detected at a concentration ≥ the method detection limit (MDL) but < the practical quantitation limit (PQL). All associated TOC quadruplicate and average results were detects <5X the EB concentration and will be qualified "4.0U,B2" at 5X the value of the EB (mg/L).

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

TOC Analysis: No target analytes were detected in the blanks, except as noted above in the summary section.

Anions Analysis: No target analytes were detected in the blanks, except the following. Chloride was detected in the continuing calibration blank (CCB) and method blank (MB) at concentrations > the MDL but ≤ the PQL. All associated sample results were detects >5X the CCB and MB concentrations and will not be qualified. Chloride and sulfate were detected in the EB, sample 269961-014, associated with all the samples, at concentrations > the MDL but ≤ the PQL. All associated sample results were detects >5X the EB concentrations and will not be qualified.

Total Alkalinity Analysis: No target analytes were detected in the blanks, except the following. Bicarbonate alkalinity was detected in the EB, sample 269961-018, associated with all the samples, at a concentration > the practical PQL. All associated sample results were detects >5X the EB concentrations and will not be qualified.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Analyses: All MS (PS) QC acceptance criteria were met. It should be noted that the MS (PS) analyses for the perchlorate and total alkalinity analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Replicates

All Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analyses for the perchlorate and total alkalinity analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Samples 270138-004 and -013 were diluted 3X for sulfate due to high concentrations of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Samples 270138-006 and -015 were diluted 25X for nitrate/nitrite due to high concentrations of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No field blanks (FBs) were submitted on the AR/COC(s). Samples 270138-011, -013, -015, -016, -017, and -018 were submitted as field duplicates (FDs) on the AR/COC(s). There are no "required" review criteria for FD analyses comparability; no data will be qualified as a result. It should be noted that the EBs on AR/COC 613385, contained in another SDG, are associated with the samples on AR/COC 613386.

No other specific issues were identified that affect data quality.

Sample Findings Summary

AR/COC: 613386

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	089921-017/TAV-MW13	Calcium (7440-70-2)	J, D1
	089921-017/TAV-MW13	Magnesium (7439-95-4)	J, D1
	089921-017/TAV-MW13	Sodium (7440-23-5)	J, D1
	089922-017/TAV-MW13	Calcium (7440-70-2)	J, D1
	089922-017/TAV-MW13	Magnesium (7439-95-4)	J, D1
	089922-017/TAV-MW13	Sodium (7440-23-5)	J, D1
SW846 8260B DOE-AL			
	089922-001/TAV-MW13	Carbon disulfide (75-15-0)	5.00U, B2
SW846 9060			
	089921-004/TAV-MW13	Total Organic Carbon #1 ()	4.0U, B2
	089921-004/TAV-MW13	Total Organic Carbon #2 ()	4.0U, B2
	089921-004/TAV-MW13	Total Organic Carbon #3 ()	4.0U, B2
	089921-004/TAV-MW13	Total Organic Carbon #4 ()	4.0U, B2
	089921-004/TAV-MW13	Total Organic Carbon Average ()	4.0U, B2
	089922-004/TAV-MW13	Total Organic Carbon #1 ()	4.0U, B2
	089922-004/TAV-MW13	Total Organic Carbon #2 ()	4.0U, B2
	089922-004/TAV-MW13	Total Organic Carbon #3 ()	4.0U, B2
	089922-004/TAV-MW13	Total Organic Carbon #4 ()	4.0U, B2
	089922-004/TAV-MW13	Total Organic Carbon Average ()	4.0U, B2

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

DATE: March 1, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TAV Drilling
AR/COC(s): 613392 and 613393
SDG: 270718
Laboratory: GEL
Project/Task No: 98026.01.10

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9034 (total sulfide), EPA 9056 (anions), EPA 9060 (TOC), and SM 2320B (total alkalinity). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

Total Alkalinity Analysis: No target analytes were detected in the blanks, except the following. Total alkalinity and bicarbonate alkalinity were detected in the method blank (MB) at concentrations ≥ the method detection limit (MDL) but < the practical quantitation limit (PQL). All associated sample results were detects >5X the MB concentrations and will not be qualified.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Analyses: All MS (PS) QC acceptance criteria were met. It should be noted that the MS (PS) analyses for the anions and nitrate/nitrite analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Replicates

All Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analyses for the anions and nitrate/nitrite analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Samples 270718-004 and -015 were diluted 5X for chloride and sulfate due to high concentrations of the target analytes. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Samples -006 and -017 were diluted 25X for nitrate/nitrite due to high concentrations of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Sample Findings Summary

AR/COC: 613392, 613393

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	089935-010/TAV-MW12	Iron (7439-89-6)	J+, DL2
	089935-017/TAV-MW12	Magnesium (7439-95-4)	J, D1
	089938-010/TAV-MW14	Iron (7439-89-6)	J+, DL2
	089938-017/TAV-MW14	Magnesium (7439-95-4)	J, D1
SW846 8260B DOE-AL			
	089935-001/TAV-MW12	Chloromethane (74-87-3)	UJ, MS5
	089936-001/TAV-TB12	Chloromethane (74-87-3)	UJ, MS5
	089937-001/TAV-FB2	Chloromethane (74-87-3)	UJ, MS5
	089938-001/TAV-MW14	Chloromethane (74-87-3)	UJ, MS5
	089939-001/TAV-TB13	Chloromethane (74-87-3)	UJ, MS5

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

DATE: March 22, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: Burn Site GW Characterization
AR/COC(s): 613409 and 613410
SDG: 271917
Laboratory: GEL
Project/Task No: 98026.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate) and EPA 353.2 (nitrate/nitrite). Problems were identified with the data package that result in the qualification of data.

Nitrate/nitrite Analysis:

Dilutions: The relative dilution factors between sample 271917-021 and the MS (PS) and replicate QC samples were >5X. The associated sample result was a non-detect and will be qualified "UJ,MS1,RP1" due to lack of matrix-specific accuracy and precision data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

All Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Perchlorate Analysis: All MS (PS) QC acceptance criteria were met.

Nitrate/nitrite Analyses: All MS (PS) QC acceptance criteria were met. It should be noted that the PS analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Replicates

Perchlorate Analysis: All replicate QC acceptance criteria were met.

Nitrate/nitrite Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analyses were performed on SNL sample of similar matrix from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

Perchlorate Analysis: All detection limits were properly reported. No samples required dilution.

Nitrate/nitrite Analyses: All detection limits were properly reported. Samples -005 and -012 were diluted 50X for nitrate/nitrite due to high concentrations of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X, except as noted above in the summary section. No sample data will be qualified as a result.

Other QC

All Analyses: No field blanks (FBs) were submitted on the AR/COC(s). Samples -012 and -013 were submitted as field duplicate (FDs) on the AR/COC(s). There are no "required" review criteria for FD analyses comparability. No sample data will be qualified.

No other specific issues were identified that affect data quality.

Sample Findings Summary

AR/COC: 613409, 613410

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 353.2			
	089987-018/CYN-EB2	Nitrogen, Nitrate/Nitrite ()	UJ, MS1,RP1
SW846 3535/8321A Modifie			
	089987-024/CYN-EB2	m-Nitrotoluene (99-08-1)	UJ, I4
	089987-024/CYN-EB2	p-Nitrotoluene (99-99-0)	UJ, I4
	089990-024/CYN-MW11	m-Nitrotoluene (99-08-1)	UJ, I4
	089990-024/CYN-MW11	p-Nitrotoluene (99-99-0)	UJ, I4
	089991-024/CYN-MW11	m-Nitrotoluene (99-08-1)	UJ, I4
	089991-024/CYN-MW11	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8270C			
	089987-002/CYN-EB2	3,3'-Dichlorobenzidine (91-94-1)	UJ, MS5
	089990-002/CYN-MW11	3,3'-Dichlorobenzidine (91-94-1)	UJ, MS5
	089991-002/CYN-MW11	3,3'-Dichlorobenzidine (91-94-1)	UJ, MS5

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

DATE: March 22, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: Burn Site GW Characterization
AR/COC(s): 613411 and 613412
SDG: 272046
Laboratory: GEL
Project/Task No: 98026.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate) and EPA 353.2 (nitrate/nitrite). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

All Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All Analyses: All MS (PS) QC acceptance criteria were met.

Replicates

All Analyses: All replicate QC acceptance criteria were met.

Detection Limits/Dilutions

Perchlorate Analysis: All detection limits were properly reported. No samples required dilution.

Nitrate/nitrite Analysis: All detection limits were properly reported. The samples were diluted 10X for nitrate/nitrite due to high concentrations of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Other QC

All Analyses: No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Sample Findings Summary

AR/COC: 613411, 613412

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modifie			
	089994-024/CYN-MW10	p-Nitrotoluene (99-99-0)	UJ, I4
	089997-024/CYN-MW12	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8270C			
	089994-002/CYN-MW10	3,3'-Dichlorobenzidine (91-94-1)	UJ, MS5
	089997-002/CYN-MW12	3,3'-Dichlorobenzidine (91-94-1)	UJ, MS5

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

Date: March 22, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Burn Site GWM
AR/COC: 613413
SDG: 272223
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). One sample was prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Perchlorate:
It should be noted that for sample 272223-004, the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Perchlorate:
It should be noted that for sample -004, the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Sample -003 was diluted 50X due to high concentration for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613413

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 314.0 DOE-AL			
	090000-020/CYN-MW6	Perchlorate (14797-73-0)	J-, X1

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

Date: March 24, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Burn Site GWM
AR/COC: 613414
SDG: 272333
Laboratory: GEL
Project/Task: 98026.01.06
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). One sample was prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that for sample 272333-005, the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Perchlorate:
It should be noted that for sample -006, the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that for sample -005, the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Perchlorate:
It should be noted that for sample -006, the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Sample -005 was diluted 50X due to high concentration for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613414

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

Date: April 15, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 49 and 116 GWM
AR/COC: 613444, 613445, and 613446
SDG: 273503
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Five samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), SM 2320B (alkalinity), and EPA 9012A (total cyanide). Data were reported for all required analytes. Problems were identified with the data package that results in the qualification of data.

1. Alkalinity:
   Bicarbonate alkalinity was detected in the method blanks (MBs) at concentrations ≥ the practical quantitation limit (PQL). The bicarbonate alkalinity result for sample 273503-043 was a detect <5X the MB result and will be **qualified "5.3UJ,B"** at 5X the MB value (mg/L). The other associated sample results were detects ≥5X the MB result and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

Anions by Ion Chromatography:
Sulfate was detected in the MB at a concentration ≥ the method detection limit (MDL) but < the PQL. The associated sample results were either non-detects or detects ≥5X the MB result and will not be qualified.

Chloride was detected in the equipment blank (EB), sample -039, associated with samples -016 and -027, at a concentration ≥ the PQL. The associated sample results were detects ≥5X the EB result and will not be qualified.

Alkalinity:
Bicarbonate alkalinity was detected in the EB, sample -043, associated with samples -020 and -031, at a concentration ≥ the PQL. However, it should be noted that the bicarbonate alkalinity result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the associated field sample results.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Samples -005 was diluted 10X and samples -018 and -029 were diluted 5X due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Anions by Ion Chromatography:
Samples -003 was diluted 5X for chloride and sulfate due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613444, 613445, 613446

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	090230-034/CTF-EB1	ALPHA (12587-46-1)	BD, FR3
	090230-034/CTF-EB1	BETA (12587-47-2)	BD, FR3
EPA 901.1			
	090230-033/CTF-EB1	Americium-241 (14596-10-2)	BD, FR3
	090230-033/CTF-EB1	Cesium-137 (10045-97-3)	BD, FR3
	090230-033/CTF-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	090230-033/CTF-EB1	Potassium-40 (13966-00-2)	BD, FR3
	090232-033/CYN-MW5	Americium-241 (14596-10-2)	BD, FR3
	090232-033/CYN-MW5	Cesium-137 (10045-97-3)	BD, FR3
	090232-033/CYN-MW5	Cobalt-60 (10198-40-0)	BD, FR3
	090232-033/CYN-MW5	Potassium-40 (13966-00-2)	BD, FR3
	090233-033/CYN-MW5	Americium-241 (14596-10-2)	BD, FR3
	090233-033/CYN-MW5	Cesium-137 (10045-97-3)	BD, FR3
	090233-033/CYN-MW5	Cobalt-60 (10198-40-0)	BD, FR3
	090233-033/CYN-MW5	Potassium-40 (13966-00-2)	BD, FR3
SM 2320B			
	090230-022/CTF-EB1	Bicarbonate alkalinity (CaCO3) (7	5.3UJ, B
SW846 3005/6020 DOE-AL			
	090227-009/CTF-MW1	Aluminum (7429-90-5)	0.077U, B
	090227-009/CTF-MW1	Nickel (7440-02-0)	J, D1
	090230-009/CTF-EB1	Nickel (7440-02-0)	UJ, D1
	090232-009/CYN-MW5	Aluminum (7429-90-5)	0.077U, B
	090232-009/CYN-MW5	Copper (7440-50-8)	0.0024U, B2
	090232-009/CYN-MW5	Nickel (7440-02-0)	J, D1
	090233-009/CYN-MW5	Aluminum (7429-90-5)	0.077U, B
	090233-009/CYN-MW5	Copper (7440-50-8)	0.0024U, B2
	090233-009/CYN-MW5	Nickel (7440-02-0)	J, D1
SW846 3535/8321A Modifie			

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090227-024/CTF-MW1	p-Nitrotoluene (99-99-0)	UJ, I4
	090230-024/CTF-EB1	p-Nitrotoluene (99-99-0)	UJ, I4
	090232-024/CYN-MW5	p-Nitrotoluene (99-99-0)	UJ, I4
	090233-024/CYN-MW5	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8260B DOE-AL			
	090227-001/CTF-MW1	Acetone (67-64-1)	UJ, C3
	090228-001/CTF-TB1	Acetone (67-64-1)	UJ, C3
	090229-001/CTF-FB1	Acetone (67-64-1)	UJ, C3
	090230-001/CTF-EB1	Acetone (67-64-1)	UJ, C3
	090231-001/CTF-TB2	Acetone (67-64-1)	UJ, C3
	090232-001/CYN-MW5	Acetone (67-64-1)	UJ, C3
	090233-001/CYN-MW5	Acetone (67-64-1)	UJ, C3
	090234-001/CTF-TB3	Acetone (67-64-1)	UJ, C3

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

Date: April 15, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as follows.

Anions by Ion Chromatography:
Chloride was detected in the equipment blank (EB), sample 273600-031, associated with samples -005 and -017, at a concentration ≥ the practical quantitation limit (PQL). The associated sample results were detects ≥5X the EB result and will not be qualified.

Alkalinity:
Bicarbonate alkalinity was detected in the EB, sample -034, associated with samples -008 and -020, at a concentration ≥ the PQL. The associated sample results were detects ≥5X the MB result and will not be qualified.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Nitrate/Nitrite and Alkalinity:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Nitrate/Nitrite and Alkalinity:

It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Anions by Ion Chromatography:
Samples -005 and -017 were diluted 4X for bromide and fluoride and were diluted 25X for chloride and sulfate due to high concentration and matrix interference.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613447, 613448

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
DOE EML HASL-300, U-02-RC			
	090235-035/CTF-EB2	Uranium-233/234 ()	BD, FR3
	090235-035/CTF-EB2	Uranium-235/236 (13982-70-2)	BD, FR3
	090235-035/CTF-EB2	Uranium-238 (7440-61-1)	BD, FR3
EPA 900.0/SW846 9310			
	090235-034/CTF-EB2	ALPHA (12587-46-1)	BD, FR3
	090235-034/CTF-EB2	BETA (12587-47-2)	BD, FR3
EPA 901.1			
	090235-033/CTF-EB2	Americium-241 (14596-10-2)	BD, FR3
	090235-033/CTF-EB2	Cesium-137 (10045-97-3)	BD, FR3
	090235-033/CTF-EB2	Cobalt-60 (10198-40-0)	BD, FR3
	090235-033/CTF-EB2	Potassium-40 (13966-00-2)	BD, FR3
	090237-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090237-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090237-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090237-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
	090238-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090238-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090238-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090238-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
SW846 3005/6020 DOE-AL			
	090235-009/CTF-EB2	Calcium (7440-70-2)	0.44U, B
	090235-009/CTF-EB2	Manganese (7439-96-5)	UJ, MS1,D1
	090235-010/CTF-EB2	Calcium (7440-70-2)	0.44U, B
	090235-010/CTF-EB2	Manganese (7439-96-5)	UJ, MS1,D1
	090237-009/CTF-MW2	Copper (7440-50-8)	0.017U, B2
	090237-009/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
	090237-010/CTF-MW2	Aluminum (7429-90-5)	1.5UJ, B2
	090237-010/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090238-009/CTF-MW2	Arsenic (7440-38-2)	0.058U, B2
	090238-009/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
	090238-010/CTF-MW2	Aluminum (7429-90-5)	1.5UJ, B2
	090238-010/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
SW846 3535/8321A Modifie			
	090235-024/CTF-EB2	p-Nitrotoluene (99-99-0)	UJ, I4
	090237-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
	090237-024/CTF-MW2	RDX (121-82-4)	J+, C2,S1
	090238-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
	090238-024/CTF-MW2	RDX (121-82-4)	J+, C2
SW846 8260B DOE-AL			
	090240-001/CTF-FB2	Bromodichloromethane (75-27-4	2.9U, B2
	090240-001/CTF-FB2	Chloroform (67-66-3)	5.5U, B2
	090240-001/CTF-FB2	Dibromochloromethane (124-48	2.4U, B2
SW846 8270C			
	090235-002/CTF-EB2	Di-n-octylphthalate (117-84-0)	R, I5
	090237-002/CTF-MW2	Di-n-octylphthalate (117-84-0)	R, I5
	090238-002/CTF-MW2	Di-n-octylphthalate (117-84-0)	R, I5

All other analyses met QC acceptance criteria; no further data should be qualified.

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Memorandum

Date: April 12, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 149 GWM
AR/COC: 613449 and 613450
SDG: 273689
Laboratory: GEL
Project/Task: 98026.01.14
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. Problems were identified with the data package that results in the qualification of data.

1. Alkalinity:
   Bicarbonate alkalinity was detected in the method blanks (MBs) at concentrations ≥ the practical quantitation limit (PQL). The bicarbonate alkalinity result for sample 273689-023 was a detect <5X the MB result and will be **qualified "5.3UJ,B"** at 5X the MB value (mg/L). The other associated sample results were detects ≥5X the MB result and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

Anions by Ion Chromatography:
Chloride was detected in the equipment blank (EB), sample -020, associated with samples -004 and -011, at a concentration ≥ the PQL. The associated sample results were detects ≥5X the EB result and will not be qualified.

Alkalinity:
Bicarbonate alkalinity was detected in the EB, sample -023, associated with samples -007 and -014, at a concentration ≥ the PQL. However, it should be noted that the bicarbonate alkalinity result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the associated field sample results.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Perchlorate:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Alkalinity:
It should be noted that for sample -023 the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Perchlorate:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Alkalinity:
It should be noted that for sample -023 the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Samples -005 and -012 were diluted 10X due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Anions by Ion Chromatography:
Samples -004 and -011 were diluted 20X for chloride and sulfate due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613449, 613450

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SM 2320B			
	090241-022/CTF-EB3	Bicarbonate alkalinity (CaCO3) (7	5.3UJ, B
SW846 3005/6020 DOE-AL			
	090241-009/CTF-EB3	Chromium (7440-47-3)	0.022U, B
	090241-009/CTF-EB3	Nickel (7440-02-0)	0.0027U, B
	090241-010/CTF-EB3	Chromium (7440-47-3)	0.022U, B
	090241-010/CTF-EB3	Iron (7439-89-6)	0.45U, B
	090243-009/CTF-MW3	Chromium (7440-47-3)	0.022U, B
	090243-009/CTF-MW3	Copper (7440-50-8)	0.0020U, B2
	090243-009/CTF-MW3	Manganese (7439-96-5)	0.0063U, B2
	090243-010/CTF-MW3	Chromium (7440-47-3)	0.022U, B
	090244-009/CTF-MW3	Copper (7440-50-8)	0.0020U, B2
	090244-010/CTF-MW3	Chromium (7440-47-3)	0.022U, B
SW846 7470A			
	090241-009/CTF-EB3	Mercury (7439-97-6)	UJ, B4
	090241-010/CTF-EB3	Mercury (7439-97-6)	UJ, B4
	090243-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090243-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090244-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090244-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
SW846 8260B DOE-AL			
	090241-001/CTF-EB3	Acetone (67-64-1)	UJ, C3
	090242-001/CTF-TB6	Acetone (67-64-1)	UJ, C3
	090243-001/CTF-MW3	Acetone (67-64-1)	UJ, C3
	090243-001/CTF-MW3	Bromodichloromethane (75-27-4	1.0U, B2
	090243-001/CTF-MW3	Chloroform (67-66-3)	1.0U, B2
	090243-001/CTF-MW3	Dibromochloromethane (124-48	1.0U, B2
	090244-001/CTF-MW3	Acetone (67-64-1)	UJ, C3
	090244-001/CTF-MW3	Chloroform (67-66-3)	1.0U, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090244-001/CTF-MW3	Dibromochloromethane (124-48	1.0U, B2
	090245-001/CTF-TB7	Acetone (67-64-1)	UJ, C3
	090246-001/CTF-FB3	Acetone (67-64-1)	UJ, C3
	090246-001/CTF-FB3	Bromodichloromethane (75-27-4	2.0U, B2
	090246-001/CTF-FB3	Chloroform (67-66-3)	4.5U, B2
	090246-001/CTF-FB3	Dibromochloromethane (124-48	2.2U, B2

All other analyses met QC acceptance criteria; no further data should be qualified.

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SECTION IV
SOLID WASTE MANAGEMENT UNITS 149 AND 154 QUARTERLY MONITORING REPORT

1.0 Introduction

This report summarizes the first of eight quarterly sampling events for Coyote Test Field monitoring well CTF-MW3, located near Solid Waste Management Unit (SWMU) 149 (Building 9930 Septic System), and monitoring well CTF-MW2, located near SWMU 154 (Building 9960 Septic System and Seepage Pits). This supplemental groundwater monitoring at the two SWMUs is designed to address the requirements of Section VII.D.6 of the Compliance Order on Consent (the Order) (NMED April 2004) and the letter dated April 8, 2010, from the New Mexico Environment Department (NMED) Hazardous Waste Bureau (NMED April 2010). The analytical results discussed in this section correspond to the reporting period of January through March 2011. Monitoring wells CTF-MW3 and CTF-MW2 were sampled on March 9 and March 8, 2011, respectively.

Monitoring wells CTF-MW3 and CTF-MW2 were installed in August 2001. Prior to this sampling event, CTF-MW3 and CTF-MW2 had been sampled 12 and 13 times, respectively, for a variety of constituents. Monitoring well CTF-MW3 is located approximately 290 feet to the west and downgradient of SWMU 149. Monitoring well CTF-MW2 is located approximately 260 feet to the southwest and downgradient of SWMU 154. Both wells are screened in Precambrian bedrock.

The March 2011 groundwater samples were collected in accordance with the NMED-approved Sampling and Analysis Plan for the two sites (SNL/NM June 2010). The samples from CTF-MW3 were analyzed for all required constituents, consisting of volatile organic compounds (VOCs), metals (including selenium), general chemistry parameters, perchlorate, and nitrate plus nitrite. The samples from CTF-MW2 were analyzed for all required constituents, consisting of VOCs, semivolatile organic compounds, general chemistry parameters, high explosive compounds, perchlorate, metals (including uranium), nitrate plus nitrite, and radionuclides by gross alpha/beta and gamma spectroscopy.

Analytical results for the March 2011 groundwater samples were compared with the U.S. Environmental Protection Agency maximum contaminant levels (MCLs) for drinking water. No analytical results for the CTF-MW3 groundwater samples exceed the corresponding MCLs. Except for two metals (arsenic and thallium), none of the analytical results for the CTF-MW2 groundwater samples exceed the MCLs. Arsenic was reported at a concentration of 0.0595 milligrams per liter (mg/L), which exceeds the

MCL of 0.010 mg/L. Thallium was reported at a qualified, estimated concentration of 0.00249J mg/L, which is slightly above its corresponding MCL of 0.002 mg/L. The elevated concentrations of both arsenic and thallium in the groundwater samples are most likely attributable to background because monitoring well CTF-MW2 is screened in a fault-gouge zone in the Precambrian granite.

Quality control samples consisting of duplicates, field blanks, and trip blanks were also submitted for analysis. The corresponding data validation results are presented in Appendix A.

The U.S. Department of Energy and Sandia Corporation will continue to conduct quarterly groundwater monitoring of monitoring wells CTF-MW3 and CTF-MW2.

2.0 Groundwater Monitoring

Quarterly groundwater monitoring activities were performed at SWMUs 149 and 154 in March 2011; the analytical results are presented in Appendix A. This sampling event represents the first of eight supplemental quarterly events for the two monitoring wells (CTF-MW3 and CTF-MW2).

3.0 Projected Activities for the Upcoming Quarter

The second of the eight supplemental quarterly sampling events will be conducted during the upcoming quarter (April to June 2011).

4.0 References

New Mexico Environment Department (NMED), April 2004. “Compliance Order on Consent, Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10,” New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2010. Letter to K. Davis (U.S. Department of Energy) and M. Walck (Sandia Corporation), “Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001,” New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

Sandia National Laboratories/New Mexico (SNL/NM), June 2010. "Sampling and Analysis Plans for Monitoring Wells CTF-MW2 and CTF-MW3," in U.S. Department of Energy/Sandia Corporation Response to the New Mexico Environment Department letter entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008)*, Sandia National Laboratories, Albuquerque, New Mexico, April 8, 2010.

SNL/NM, see Sandia National Laboratories, New Mexico.

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Appendix A

SWMUs 149 and 154 Quarterly Groundwater Monitoring Assessment Report, January – March 2011

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ATTACHMENTS

Attachment 1. Field Measurement Logs and Documentation

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Attachment 3. Data Validation Reports for Groundwater Analytical Results, January 2011 – March 2011

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SECTION IV, APPENDIX A
SWMUs 149 AND 154 QUARTERLY GROUNDWATER MONITORING ASSESSMENT REPORT, JANUARY – MARCH 2011

1.0 Introduction

This Quarterly Groundwater Monitoring Assessment Report has been prepared pursuant to the "U.S. Department of Energy (DOE)/Sandia Corporation (Sandia) Response to the New Mexico Environment Department (NMED) letter of April 8, 2010, entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001"* (SNL/NM June 2010). The activities associated with the groundwater monitoring task are summarized as follows.

SNL personnel performed Fiscal Year 2011 (FY11) quarterly (Second Quarter) groundwater sampling at Solid Waste Management Units (SWMUs) 149 and 154 at Sandia National Laboratories/New Mexico (SNL/NM) (Figures A-1 and A-2) on March 8 and March 9, 2011. This sampling represents the quarterly groundwater monitoring event for the time period from January 2011 through March 2011. Quarterly groundwater monitoring at SWMUs 149 and 154 is designed to address the requirements of Section VII.D.6 of the Compliance Order on Consent (the Order) (NMED April 2004) and the letter dated April 8, 2010, from the NMED (April 2010).

This groundwater sampling event was conducted in conformance with procedures outlined in the "Sampling and Analysis Plan (SAP) for Collection and Analysis of Additional Groundwater Samples Collected from Monitoring Well CTF-MW3, Located Near SNL/NM SWMU 149" (Attachment 1, SNL/NM June 2010) and "Sampling and Analysis Plan for Collection and Analysis of Additional Groundwater Samples Collected from Monitoring Well CTF-MW2, Located Near SNL/NM SWMU 154" (Attachment 2, SNL/NM June 2010). These SAPs were approved by the NMED in December 2010 (NMED December 2010).

This report describes groundwater sampling activities and presents analytical results for the first of eight quarterly groundwater assessment monitoring periods. In March 2011, environmental groundwater samples were collected from Coyote Test Field monitoring well CTF-MW3, located near SWMU 149 (Figure A-1), and CTF-MW2, located near SWMU 154 (Figure A-2), in accordance with the NMED-approved SAP for each site (Attachments 1 and 2, SNL/NM June 2010). Both wells were installed in August 2001.

The samples from CTF-MW3 were analyzed for the required constituents, consisting of general chemistry parameters, volatile organic compounds (VOCs), perchlorate, metals (including selenium), and nitrate plus nitrite (NPN). The samples from CTF-MW2 were analyzed for the required constituents, consisting of general chemistry parameters, VOCs, semivolatile organic compounds (SVOCs), high explosive (HE) compounds, perchlorate, metals (including barium), NPN, gross alpha/beta activity, and gamma spectroscopy. A duplicate sample was collected and submitted for all analyses.

The following sections provide descriptions of the field methods used and discussions of the analytical and quality control (QC) sampling results.

2.0 Field Methods and Measurements

The quarterly groundwater sampling field measurements were collected in conformance with the DOE/Sandia Response to the NMED letter of April 8, 2010 (SNL/NM June 2010). Groundwater monitoring at SWMUs 149 and 154 was performed according to the SAPs submitted as Attachments 1 and 2 to the DOE/Sandia Response (SNL/NM June 2010) and updated SNL/NM administrative operating procedures (AOPs) and field operating procedures (FOPs) (SNL/NM July 2007, August 2007a, and August 2007b).

2.1 Equipment Decontamination

A portable Bennett™ groundwater sampling system was used to collect the groundwater samples from both wells. The Bennett™ sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells according to procedures described in SNL/NM FOP 05-03, “Long-Term Environmental Stewardship (LTES) Groundwater Sampling Equipment Decontamination” (SNL/NM August 2007a). An equipment blank (EB) or rinsate sample was collected to verify the effectiveness of the equipment decontamination process and analyzed for relevant parameters, listed in Table A-1, prior to sampling each well. Table A-2 presents the details for groundwater samples collected from CTF-MW3 and CTF-MW2 during Second Quarter, FY11.

2.2 Well Evacuation

In accordance with procedures described in SNL/NM FOP 05-01, "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM August 2007b), all wells were purged a minimum of one saturated casing volume (the volume of one length of the saturated screen plus the borehole annulus around the saturated screen interval) and monitored for stability of water quality parameters, if applicable.

Field water-quality measurements for turbidity, potential of hydrogen (pH), temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the wells prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with a YSI™ Model 620 water quality meter. Turbidity was measured with a HACH™ Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units (NTU)
- pH is within 0.1 units
- Temperature is within 1.0 degree Celsius
- SC is within 5 percent as micromhos per centimeter

Table A-3 summarizes temperature, pH, SC, and turbidity measurements, which are discussed in Section 4.0 of this appendix. Field Measurement Logs (Attachment 1) documenting details of well purging and water quality measurements have been submitted to the SNL/NM Customer Funded Records Center.

2.3 Groundwater Sample Collection

All groundwater samples were collected directly from the sample discharge tube into laboratory-prepared sample containers. Chemical preservatives for samples intended for chemical analyses were added to the sample containers at the laboratory prior to shipment to SNL/NM. The groundwater samples were submitted to GEL Laboratories, LLC (GEL) for chemical analysis using methods outlined in Table A-1. Table A-1 also lists

the sample containers and preservative requirements. Section 3.0 of this appendix summarizes the analytical results.

The sample identification number, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table A-2. Chain-of-custody forms and supporting documentation are included in Attachment 2.

3.0 Analytical Results

Groundwater samples were submitted to GEL for chemical and radiological analyses. Samples were analyzed in accordance with applicable U.S. Environmental Protection Agency (EPA) analytical methods. Groundwater sampling results are compared with established EPA maximum contaminant levels (MCLs) for drinking water supplies. Analytical results for samples collected from CTF-MW3 and CTF-MW2 are shown in tabulated form in Tables A-4 through A-18. Analytical reports, including certificates of analyses, analytical methods, method detection limits (MDLs), minimum detectable activity (MDA), critical level, practical quantitation limits (PQLs), dates of analyses, results of QC analyses, and data validation findings are filed in the SNL/NM Customer Funded Records Center.

The analytical data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 2 (SNL/NM July 2007). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets are included as Attachment 3.

3.1 Field Water Quality Measurements

SWMU 149, CTF-MW3. Table A-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling at CTF-MW3.

SWMU 154, CTF-MW2. Table A-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling at CTF-MW2. Turbidity measurements were higher during this groundwater sampling event than historical values and ranged from 23.5 to 53.7 NTUs. Historical readings have been less than 1 NTU. The pump intake was set approximately 2 feet above the bottom of the well screen during purging and sampling. A camera video survey of monitoring well CTF-MW2 was performed on March 30, 2011. The video showed that the borehole and

screen were in good condition. No structural issues were observed on the polyvinyl chloride well casing; however, visible staining was present on the casing walls. Approximately 5 to 7 feet of silt and sand material were found at the bottom of the borehole. Approximately 1 to 2 feet of material was found within the screened interval. Based on this observation, samples for the next groundwater sampling event (May 2011) will be collected from the middle of the screen interval.

3.2 Volatile Organic Compounds

SWMU 149, CTF-MW3. No VOCs were detected at concentrations exceeding established MCLs in any CTF-MW3 groundwater sample. The results for the compounds bromodichloromethane, chloroform, and dibromochloromethane were qualified as not detected during data validation due to associated blank contamination. Table A-4 summarizes detected VOCs in environmental groundwater samples from CTF-MW3, and Table A-5 lists the MDLs for associated VOCs analyzed.

SWMU 154, CTF-MW2. No VOCs were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater sample. The VOC toluene was detected in the duplicate sample at a concentration of 0.250 micrograms per liter (μg/L). However, toluene was not detected above the laboratory MDL in the associated environmental sample. Table A-4 summarizes detected VOCs in environmental groundwater samples from CTF-MW2, and Table A-6 summarizes MDLs for associated VOCs analyzed.

3.3 Semivolatile Organic Compounds

SWMU 149, CTF-MW3. Analysis of SVOCs is not required for CTF-MW3.

SWMU 154, CTF-MW2. No SVOCs were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater sample. No SVOCs were reported above laboratory MDLs. The result for the SVOC di-n-octylphthalate was qualified as unusable during data validation as the initial calibration intercept for this compound did not meet acceptance criteria. Table A-4 summarizes detected SVOCs in environmental groundwater samples, and Table A-6 summarizes MDLs for associated SVOCs analyzed.

3.4 High Explosive Compounds

SWMU 149, CTF-MW3. Analysis of HE compounds is not required for CTF-MW3.

SWMU 154, CTF-MW2. No HE compounds were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater sample. The HE compound hexahydro-trinitro-triazine (RDX) was detected in the CTF-MW2 environmental and duplicate samples at concentrations of 0.298 and 0.372 μg/L, respectively. Table A-4 summarizes detected HE compounds in environmental groundwater samples, and Table A-7 summarizes the MDLs for associated HE compounds analyzed.

3.5 Nitrate Plus Nitrite

SWMU 149, CTF-MW3. Table A-8 summarizes NPN results for CTF-MW3. NPN values were compared with the nitrate MCL of 10 milligrams per liter (mg/L). No detections of NPN exceeding the MCL were reported. NPN was reported at concentrations of 5.17 mg/L in the environmental sample and 5.54 mg/L in the duplicate sample.

SWMU 154, CTF-MW2. Table A-8 summarizes NPN results for CTF-MW2. No detections of NPN above the laboratory MDL were reported for CTF-MW2 samples.

3.6 Anions and Alkalinity

SWMU 149, CTF-MW3. Table A-9 summarizes alkalinity and major anion (bromide, chloride, fluoride, and sulfate) results. No parameters were detected above established MCLs.

SWMU 154, CTF-MW2. Table A-9 summarizes alkalinity and major anion (bromide, chloride, fluoride, and sulfate) results. No parameters were detected above established MCLs.

3.7 Perchlorate

SWMU 149, CTF-MW3. Perchlorate was not detected above the screening level/MDL of 0.004 mg/L in CTF-MW3 samples. Table A-10 presents perchlorate results.

SWMU 154, CTF-MW2. Perchlorate was not detected above the screening level/MDL of 0.004 mg/L in CTF-MW2 samples. Table A-10 presents perchlorate results.

Perchlorate results are discussed in more detail in Section III of the Consolidated Quarterly Report ("Perchlorate Screening Quarterly Monitoring Report, First Quarter of Calendar Year 2011 [January, February, and March 2011"]).

3.8 Metals

Metal analyses include two sets of analyses and results for filtered and unfiltered groundwater samples. Groundwater samples obtained for total metal analyses are collected without filtering, and dissolved metal samples are collected by filtering the sample prior to analysis. Target Analyte List (TAL) metals plus uranium in both unfiltered and filtered fractions were analyzed in all samples.

SWMU 149, CTF-MW3. No metals were detected above established MCLs in any groundwater sample. The result for chromium was qualified as not detected during data validation because chromium was detected at less than five times the associated laboratory method blank sample. For the unfiltered sample, copper and manganese were qualified as not detected during data validation as these metals were detected at less than five times the result for the associated EB sample. Metal results for both unfiltered and filtered samples from CTF-MW3 are summarized in Tables A-11 and A-12, respectively.

SWMU 154, CTF-MW2. No metals were detected above established MCLs in any CTF-MW2 groundwater sample, except for arsenic and thallium. Arsenic was detected above the MCL of 0.010 mg/L in all CTF-MW2 groundwater samples. Total arsenic was reported at concentrations of 0.0595 and 0.053 mg/L, and dissolved arsenic at 0.0544 and 0.0521 mg/L. The total arsenic result for the CTF-MW2 environmental duplicate sample was qualified as not detected during data validation as the result reported was less than five times the EB sampling result.

Total thallium was detected above the MCL of 0.002 mg/L in the environmental sample at a concentration of 0.00249 mg/L. Thallium was not detected above the laboratory MDL in the associated environmental duplicate sample or in dissolved sample fractions. The certificates of analyses indicate that GEL diluted metal samples for all parameters (5x and 50x), except mercury. Historical results for thallium and other metals show that samples were analyzed without dilution. Results for total copper and dissolved aluminum in the CTF-MW2 environmental samples were qualified as not detected during data validation because these metals were detected at less than five times the result for the associated EB sample. Unfiltered and filtered metal results for CTF-MW2 are summarized in Tables A-13 and A-14, respectively.

3.9 Gamma Spectroscopy and Radioisotopic Analyses

SWMU 149, CTF-MW3. Gamma spectroscopy analysis is not required for CTF-MW3.

SWMU 154, CTF-MW2. CTF-MW2 groundwater samples were screened for gamma-emitting radionuclides, gross alpha, and gross beta activity. Additional samples for isotopic uranium were collected to support evaluation of gross alpha activities. The results for gamma spectroscopy, gross alpha, gross beta, and isotopic uranium are presented in Table A-15. Gamma spectroscopy activities for short-list radionuclides are less than the associated MDAs, except for potassium-40. Potassium-40 activities for environmental and duplicate samples are 69.9 ± 43.1 and 84.6 ± 32.9 picocuries per liter (pCi/L), respectively.

Radioisotopic analyses included gross alpha, gross beta, and isotopic uranium analyses. Gross alpha activity is measured as a screening tool and according to Title 40, Code of Federal Regulations Parts 9, 141, and 142, Table I-4, does not include uranium, which is measured independently. Therefore, gross alpha activity measurements were corrected by subtracting out the uranium activity. Corrected gross alpha activities are all below the MCL of 15 pCi/L at -0.08 pCi/L in the environmental sample and -1.71 pCi/L in the environmental duplicate sample (negative numbers represent a lower net count for the samples relative to the background count). Gross beta activity results do not exceed established MCLs. In this region, groundwater contacts bedrock, which contains material high in naturally occurring uranium.

3.10 Sample Results Exceeding Maximum Contaminant Levels

Table A-16 lists the concentrations of all constituents that were detected at concentrations exceeding the EPA MCLs. The only constituents exceeding MCLs in samples collected during this quarter were arsenic and thallium, which were detected in the CTF-MW2 samples.

In future quarterly reports for SWMUs 149 and 154, Table A-16 will show data from all quarterly sampling events that exceed MCLs. Future quarterly reports also will present data in graphical form showing the concentrations of the constituents over time.

4.0 Quality Control Samples

Field and laboratory QC samples were prepared to determine the accuracy of the methods used and to detect inadvertent sample contamination that may have occurred during the sampling and analysis process. The following sections discuss each sample type.

4.1 Field Quality Control Samples

Field QC samples included environmental duplicate, EB, trip blank (TB), and field blank (FB) samples. The field QC samples were submitted for analysis along with the groundwater samples in accordance with QC procedures specified in the SAPs for SWMUs 149 and 154 (Attachments 1 and 2, SNL/NM June 2010).

4.1.1 Equipment Blank Samples

A portable Bennett™ groundwater sampling system was used to collect groundwater samples. The sampling pump and tubing bundle were decontaminated prior to installation into the monitoring wells according to procedures described in SNL/NM FOP 05-03, "LTES Groundwater Sampling Equipment Decontamination," (SNL/NM August 2007a). In accordance with SNL/NM FOP 05-03, the following solutions were pumped through the sampling system: 5 gallons of deionized (DI) water mixed with 20 milliliters (mL) of nonphosphate laboratory detergent; 5 gallons of DI water; 5 gallons of DI water mixed with 20 mL reagent grade nitric acid; and 15 gallons of DI water. In addition, the outside of the pump tubing was rinsed with DI water. EB or rinsate samples are collected to verify the effectiveness of the equipment decontamination process. The EB samples were collected prior to sampling monitoring wells CTF-MW3 and CTF-MW2 and submitted for all analyses.

Antimony, bromodichloromethane, chloroform, chloride, copper, dibromochloromethane, manganese, and sodium were detected in the EB sample for CTF-MW3. No corrective action is required for antimony as this metal was not detected in the associated environmental sample. No corrective action is required for chloride or sodium as these parameters were detected in the environmental samples at concentrations greater than five times the blank result. The environmental sample results for bromodichloromethane, chloroform, copper, dibromochloromethane, and manganese were qualified as not detected during data validation because the associated environmental sample results are less than five times the EB result.

Aluminum, arsenic, bromodichloromethane, chloroform, chloride, chromium, copper, dibromochloromethane, sodium, and zinc were detected in the EB sample for CTF-MW2. No corrective action was required for bromodichloromethane, chloroform, chloride, chromium, dibromochloromethane, sodium, or zinc as these parameters either were not detected in the associated environmental samples or were detected at concentrations greater than five times the EB result. Results for total arsenic, copper, and dissolved aluminum in the CTF-MW2 environmental sample were qualified as not detected during data validation because the associated results are less than five times the EB result.

4.1.2 Duplicate Environmental Samples

Duplicate environmental samples were collected and analyzed in order to estimate the overall reproducibility of the sampling and analytical process. The duplicate samples were collected immediately after the original environmental samples to reduce variability caused by time and/or sampling mechanics. The duplicate samples were analyzed for the same parameters as the environmental samples.

Table A-17 summarizes the results for the duplicate sample analyses and calculated relative percent difference (RPD) values for CTF-MW3. The results show that sampling and analysis precision was in conformance with the SWMU 149 SAP requirements for all measured parameters.

Table A-18 summarizes the results for the duplicate sample analyses and calculated RPD values for CTF-MW2. The results show that sampling and analysis precision was in conformance with the SWMU 154 SAP requirements for all measured VOCs and metals. The RPD for the HE compound RDX was calculated at 22 and is considered an estimated value because the reported RDX concentrations are below associated PQLs.

4.1.3 Field Blank Samples

FB samples were collected for VOCs to assess whether contamination of the samples resulted from ambient field conditions. The FB samples were prepared by pouring DI water into sample containers at the sampling points (i.e., inside the sampling truck at each well location) to simulate the transfer of environmental samples from the sampling system to the sample container.

Bromodichloromethane, chloroform, and dibromochloromethane were detected in the FB sample for CTF-MW3. The environmental sample results for bromodichloromethane,

chloroform, and dibromochloromethane were qualified as not detected during data validation because the results are less than five times the blank result.

Bromodichloromethane, chloroform, and dibromochloromethane were detected in the FB sample for CTF-MW2. No corrective action was necessary as these compounds were not detected in the CTF-MW2 environmental or duplicate samples.

4.1.4 Trip Blank Samples

TB samples are submitted whenever samples are collected for VOC analyses to assess whether contamination of the samples has occurred during shipment and storage. TB samples consist of laboratory reagent grade water with hydrochloric acid preservative contained in 40-mL volatile organic analysis vials prepared by the analytical laboratory, which accompany the empty sample containers supplied by the laboratory. The TBs were brought to the field and accompanied each sample shipment. A total of two TBs were submitted with the samples collected during the Second Quarter of FY11. No VOCs were detected above associated laboratory MDLs. Toluene was detected in the TB sample associated with the EB sample for CTF-MW2. No corrective action was necessary as this compound was not detected in the EB sample.

4.2 Laboratory Quality Control Samples

Internal laboratory QC samples, including method blanks and duplicate laboratory control samples, were analyzed concurrently with all groundwater samples. All chemical data were reviewed and validated in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 2 (SNL/NM July 2007).

No significant data quality problems were noted during the data validation process for CTF-MW3 samples.

No significant data quality problems were noted during the data validation process for CTF-MW2 samples, except for the SVOC di-n-octylphthalate. The result for this compound was qualified as unusable during data validation because the initial calibration intercept for this compound did not meet acceptance criteria.

The data validation reports are provided in Attachment 3 and filed in the SNL/NM Customer Funded Records Center.

4.3 Variances and Nonconformances

No variances or nonconformances from the requirements in the SWMU 149 Groundwater Monitoring SAP or project-specific issues were identified during the March 2011 sampling activities at CTF-MW3.

Variances, nonconformances, or project-specific issues that deviated from the requirements in the SWMU 154 Groundwater Monitoring SAP during the March 2011 sampling activities at CTF-MW2 are identified as follows:

- The result for the SVOC di-n-octylphthalate was qualified as unusable during data validation because the initial calibration intercept for this compound did not meet acceptance criteria. CTF-MW2 is sampled on a quarterly basis, and a sample will be collected in late May or June 2011 for SVOC analysis.

5.0 Summary

In March 2011, samples were collected from monitoring wells CTF-MW3, located near SWMU 149, and CTF-MW2, located near SWMU 154. Sampling results were compared with EPA MCL guidelines for drinking water.

Analytical parameters for CTF-MW3 samples included VOCs, NPN, major anions, alkalinity, TAL total metals, and perchlorate. No parameters were detected above established MCLs. All groundwater monitoring data for CTF-MW3 are comparable to historical values.

Analytical parameters for CTF-MW2 included VOCs, SVOCs, HE, NPN, major anions, alkalinity, TAL total metals plus uranium, perchlorate, gamma spectroscopy, gross alpha/beta activity, and isotopic uranium. No parameters were detected above established MCLs, except for arsenic and thallium.

Arsenic was detected above the MCL of 0.010 mg/L in all CTF-MW2 groundwater samples at concentrations of 0.0595 and 0.053 mg/L in unfiltered samples and at 0.0544 and 0.0521 mg/L in filtered samples. These values are comparable to historical values. The result for total arsenic in the CTF-MW2 environmental duplicate sample was qualified as not detected during data validation, as the result reported was less than five times the EB result.

Results for thallium in the sample from CTF-MW2 exceed historical values. Total thallium was detected above the MCL of 0.002 mg/L in the unfiltered environmental sample at a concentration of 0.00249 mg/L. Historical results indicate thallium at concentrations ranging from 0.00111 to 0.00133 mg/L. Thallium was not detected above the laboratory MDL in the associated environmental duplicate sample or dissolved sample fractions.

DOE/Sandia will continue quarterly groundwater monitoring in CTF-MW3 and CTF-MW2, paying particular attention to arsenic and thallium concentrations in CTF-MW2 groundwater samples.

6.0 References

New Mexico Environment Department (NMED), April 2004. "Compliance Order on Consent, Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10," New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2010. "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001." New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), December 2010. "Approval with Modifications, Response to April 8, 2010 Letter, Groundwater Monitoring Plan for SWMUs 149 and 154," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

Sandia National Laboratories, New Mexico (SNL/NM), June 2010. "U.S. Department of Energy/Sandia Corporation Response to the New Mexico Environment Department letter entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008) Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001*," Sandia National Laboratories, Albuquerque, New Mexico, April 8, 2010.

Sandia National Laboratories, New Mexico (SNL/NM), July 2007. "Data Validation Procedure for Chemical and Radiochemical Data," Administrative Operating Procedure 00-03, Revision 2, Sample Management Office, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), August 2007a. "Long-Term Environmental Stewardship (LTES) Groundwater Sampling Equipment Decontamination," Field Operating Procedure 05-03, Revision 02, Long-Term Environmental Stewardship, Environmental Management Department, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), August 2007b. "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements," Field Operating Procedure 05-01, Revision 02, Long-Term Environmental Stewardship, Environmental Management Department, Sandia National Laboratories, New Mexico.

SNL/NM, see Sandia National Laboratories/New Mexico.

Figures

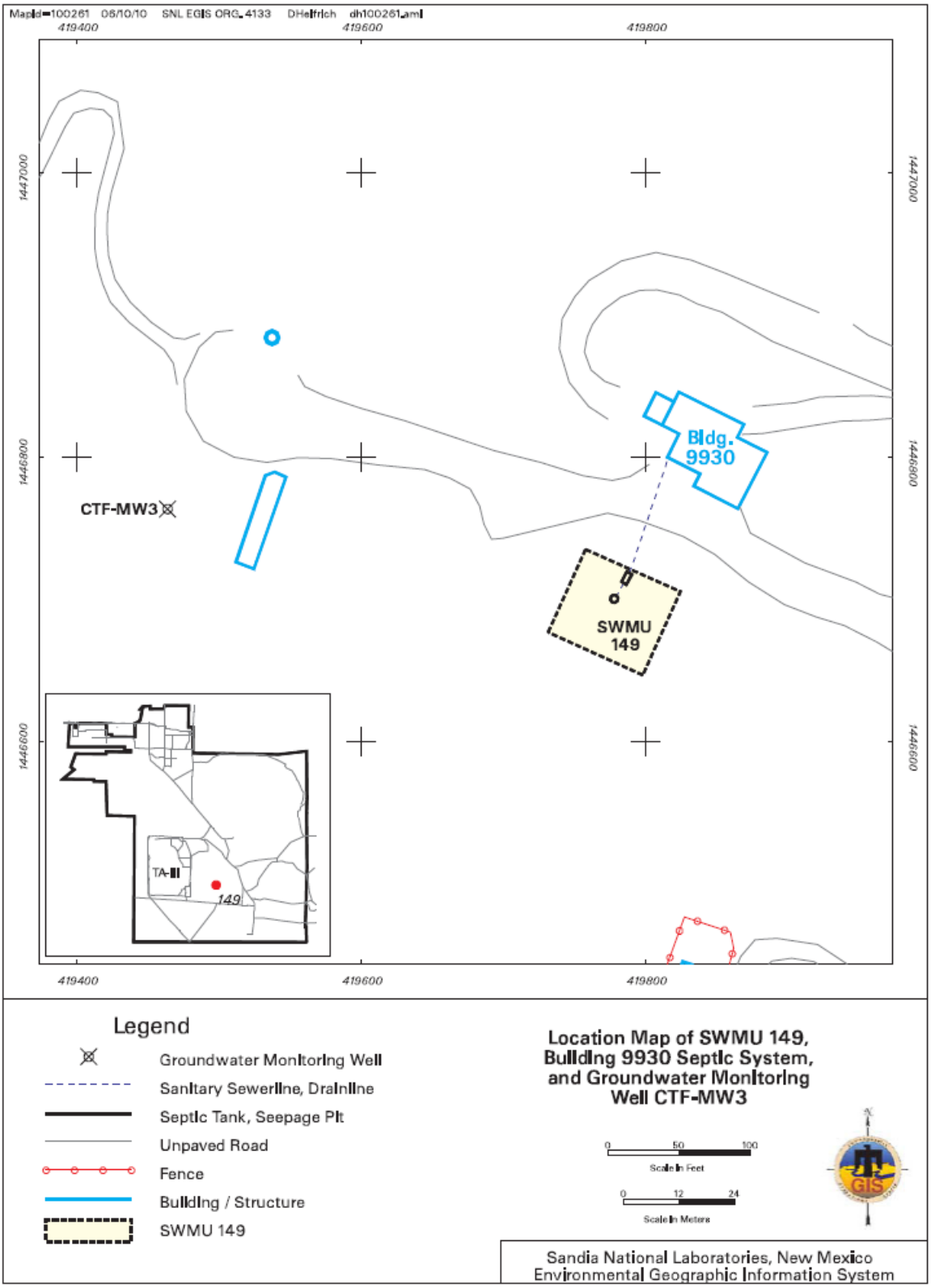

Figure A-1

Location of Monitoring Well CTF-MW3 near SWMU 149

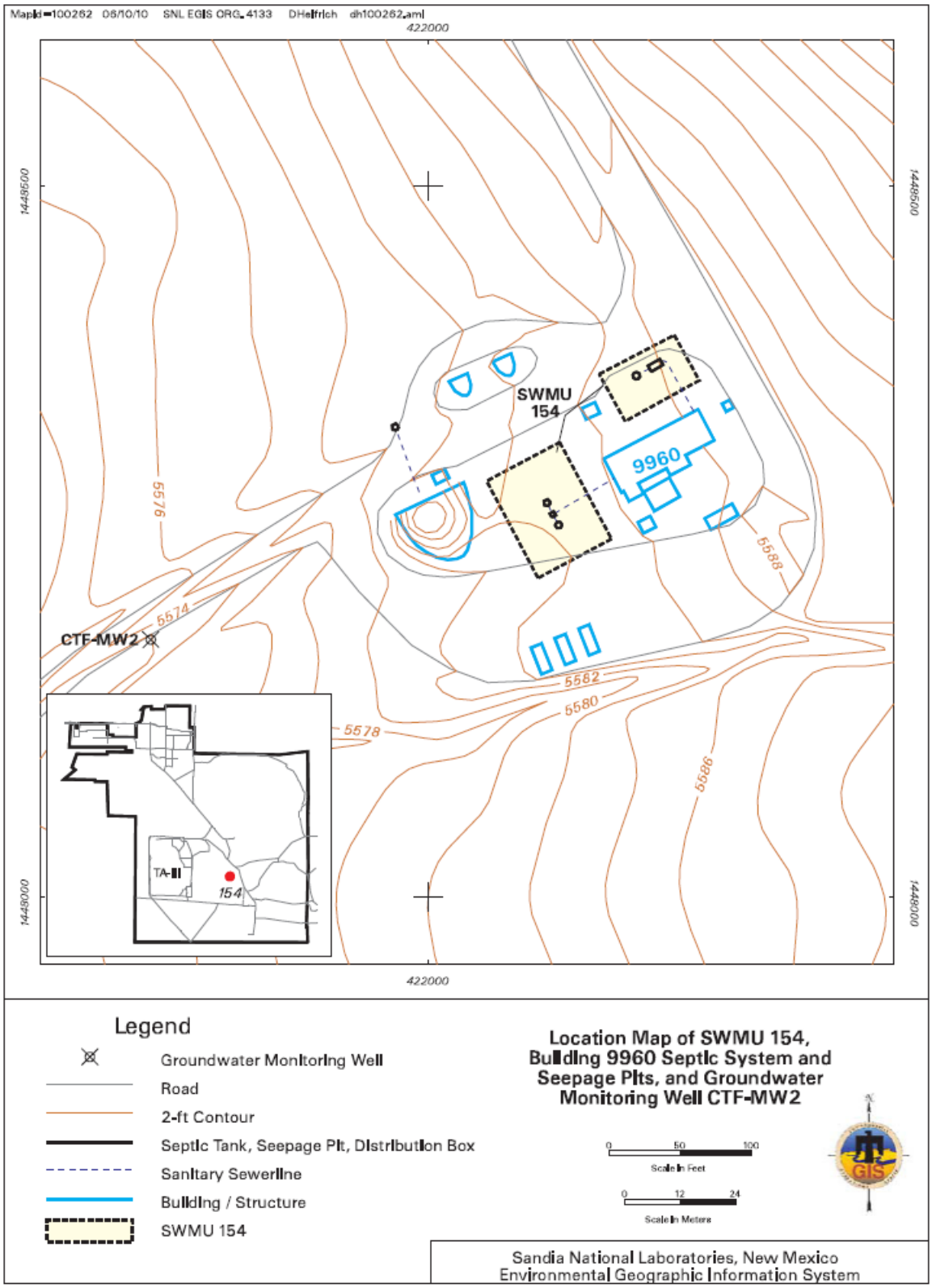

Figure A-2

Location of Monitoring Well CTF-MW2 near SWMU 154

Tables

Table A-1

Laboratory Analytical Methods, Container Types, and Preservatives used for SWMU 149 and 154 Groundwater Samples

Analysis	EPA Method[a]	Volume and Container Type/Preservation
Volatile Organic Compounds	8260B	3 x 40 mL glass, HCL, 4°C
Semi-Volatile Organic Compounds	8270C	3 x 1 L Amber Glass, 4°C
High Explosives	8321A	4 x 1 L Amber Glass, 4°C
Metals[b]	6020/7470	1 x 500 mL polyethylene, HNO_3, 4°C
Perchlorate	314.0	1 x 250 mL polyethylene, 4°C
Major Anions and Cations[c]	6020/7470/9056	1 x 500 mL polyethylene, 4°C
Alkalinity as Total, Carbonate, and Bicarbonate	SM 2320B	1 x 500 mL polyethylene, 4°C
Nitrate plus Nitrite	353.2	1 x 250 mL polyethylene, H_2SO_4, 4°C
Gross Alpha/Beta	900.0	1 x 1 L polyethylene, HNO_3, 4°C
Gamma Spectroscopy[d]	901.0	1 x 1 L polyethylene, HNO_3, 4°C

Notes

[a]U.S. Environmental Protection Agency, 1986 (and updates), "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*," SW-846, 3rd ed., U.S. Environmental Protection Agency, Washington, D.C.
U.S. Environmental Protection Agency, 1999, "*Perchlorate in Drinking Water Using Ion Chromatography*," EPA 815/R-00-014, U.S. Environmental Protection Agency, Washington, D.C.
Clesceri, L.S., A.E. Greenburg, and A.D. Eaton, 1998. *Standard Methods for the Examination of Water and Wastewater,* 20th ed., Standard Method 2320B, Published jointly by American Public Health Association, American Water Works Association, and Water Environment Federation, Washington, D.C.
U.S. Environmental Protection Agency, 1980, "*Prescribed Procedures for Measurement of Radioactivity in Drinking Water,"* EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio
[b]Metals = filtered and unfiltered samples, Target Analyte List (TAL) metals including barium, calcium, magnesium, potassium, and sodium, plus uranium.
[c]Major anions include bromide, chloride, fluoride, and sulfate.
[d]Gamma spectroscopy = Americium-241, Cesium-137, Cobalt-60, and Potassium-40.
°C = Degrees Celsius.
H_2SO_4 = Sulfuric Acid.
HCL = Hydrochloric acid.
HNO_3 = Nitric acid.
L = Liter
mL = Milliliter(s).

Table A-2

Sample Details for Second Quarter, FY 2011 Groundwater Sampling

Solid Waste Management Units 149 and 154 Groundwater Monitoring Quarterly Assessment

January 2011 – March 2011

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CTF-MW3	090243	613450	SWMU 149
CTF-MW2	090237	613448	SWMU 154

Notes

AR/COC = Analysis request/chain of custody.
CTF = Coyote Test Field.
FY = Fiscal Year.
MW = monitoring well.
SWMU = Solid Waste Management Unit.

Table A-3

Summary of Field Water Quality Measurements[a]

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (μmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
SWMU 149								
CTF-MW3	09-Mar-11	18.58	1605	423.7	6.91	0.20	73.3	6.83
SWMU 154								
CTF-MW2	08-Mar-11	14.12	3324	65.0	6.03	23.5	1.8	0.19

Notes

[a]Field measurements collected prior to sampling.
°C = degrees Celsius.
% Sat = present saturation.
μmho/cm = micromhos per centimeter.
CTF = Coyote Test Field.
ID = Identification.
mg/L = milligrams per liter.
mV = millivolts.
NTU = nephelometric turbidity units.
pH = potential of hydrogen (negative logarithm of the hydrogen ion concentration).
SWMU = Solid Waste Management Unit.

Table A-4

Summary of Detected Volatile Organic, Semivolatile Organic, and High Explosive Compounds

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (μg/L)	MDL (μg/L)	PQL (μg/L)	MCL (μg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3 09-Mar-11	Bromodichloromethane	0.330	0.250	1.00	NE	J	1.0U	090243-001	SW846-8260B
	Chloroform	0.570	0.250	1.00	NE	J	1.0U	090243-001	SW846-8260B
	Dibromochloromethane	0.960	0.300	1.00	NE	J	1.0U	090243-001	SW846-8260B
CTF-MW3 (duplicate) 09-Mar-11	Chloroform	0.540	0.250	1.00	NE	J	1.0U	090244-001	SW846-8260B
	Dibromochloromethane	0.960	0.300	1.00	NE	J	1.0U	090244-001	SW846-8260B
SWMU 154									
CTF-MW2 08-Mar-11	RDX	0.298	0.104	0.325	NE	J	J+	090237-024	SW846-8321A
CTF-MW2 (duplicate) 08-Mar-11	Toluene	0.250	0.250	1.00	1,000	J		090238-001	SW846-8260B
	RDX	0.372	0.104	0.325	NE		J+	090238-024	SW846-8321A

Notes

μg/L = micrograms per liter.
CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
RDX = Hexahydro-trinitro-triazine.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J+ = The associated numerical value is an estimated quantity with a suspected positive bias.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.

Table A-5

Method Detection Limits for Volatile Organic Compounds (EPA Method SW846-8260)

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Analyte	MDL (μg/L)
1,1,1-Trichloroethane	0.325
1,1,2,2-Tetrachloroethane	0.250
1,1,2-Trichloroethane	0.250
1,1-Dichloroethane	0.300
1,1-Dichloroethene	0.300
1,2-Dichloroethane	0.250
1,2-Dichloropropane	0.250
2-Butanone	1.25
2-Hexanone	1.25
4-methyl-, 2-Pentanone	1.25
Acetone	3.50
Benzene	0.300
Bromodichloromethane	0.250
Bromoform	0.250
Bromomethane	0.300
Carbon disulfide	1.25
Carbon tetrachloride	0.300
Chlorobenzene	0.250
Chloroethane	0.300
Chloroform	0.250
Chloromethane	0.300
Dibromochloromethane	0.300
Ethyl benzene	0.250
Methylene chloride	3.00
Styrene	0.250
Tetrachloroethene	0.300
Toluene	0.250
Trichloroethene	0.250
Vinyl acetate	1.50
Vinyl chloride	0.500
Xylene	0.300
cis-1,2-Dichloroethene	0.300
cis-1,3-Dichloropropene	0.250
trans-1,2-Dichloroethene	0.300
trans-1,3-Dichloropropene	0.250

Notes

μg/L = micrograms per liter.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.

Table A-6
Method Detection Limits for Volatile and Semivolatile Organic Compounds
Solid Waste Management Unit 154 Groundwater Monitoring
Quarterly Assessment, January 2011 – March 2011

Analyte	MDL (µg/L)	Analytical Method[a]	Analyte	MDL (µg/L)	Analytical Method[a]	Analyte	MDL (µg/L)	Analytical Method[a]
1,1,1-Trichloroethane	0.325	8260B	1,2,4-Trichlorobenzene	2.00 - 2.11	8270C	Di-n-butyl phthalate	2.00 - 2.11	8270C
1,1,2,2-Tetrachloroethane	0.250	8260B	1,2-Dichlorobenzene	2.00 - 2.11	8270C	Di-n-octyl phthalate	3.00 - 3.16	8270C
1,1,2-Trichloroethane	0.250	8260B	1,3-Dichlorobenzene	2.00 - 2.11	8270C	Dibenz[a,h]anthracene	0.200 - 0.211	8270C
1,1-Dichloroethane	0.300	8260B	1,4-Dichlorobenzene	2.00 - 2.11	8270C	Dibenzofuran	2.00 - 2.11	8270C
1,1-Dichloroethene	0.300	8260B	2,4,5-Trichlorophenol	2.00 - 2.11	8270C	Diethylphthalate	2.00 - 2.11	8270C
1,2-Dichloroethane	0.250	8260B	2,4,6-Trichlorophenol	2.00 - 2.11	8270C	Dimethylphthalate	2.00 - 2.11	8270C
1,2-Dichloropropane	0.250	8260B	2,4-Dichlorophenol	2.00 - 2.11	8270C	Dinitro-o-cresol	3.00 - 3.16	8270C
2-Butanone	1.25	8260B	2,4-Dimethylphenol	2.00 - 2.11	8270C	Diphenyl amine	3.00 - 3.16	8270C
2-Hexanone	1.25	8260B	2,4-Dinitrophenol	5.00 - 5.26	8270C	Fluoranthene	2.00 - 2.11	8270C
4-methyl-, 2-Pentanone	1.25	8260B	2,4-Dinitrotoluene	2.00 - 2.11	8270C	Fluorene	0.200 - 0.211	8270C
Acetone	3.50	8260B	2,6-Dinitrotoluene	2.00 - 2.11	8270C	Hexachlorobenzene	2.00 - 2.11	8270C
Benzene	0.300	8260B	2-Chloronaphthalene	0.300 - 0.316	8270C	Hexachlorobutadiene	2.00 - 2.11	8270C
Bromodichloromethane	0.250	8260B	2-Chlorophenol	2.00 - 2.11	8270C	Hexachlorocyclopentadiene	3.00 - 3.16	8270C
Bromoform	0.250	8260B	2-Methylnaphthalene	0.300 - 0.316	8270C	Hexachloroethane	2.00 - 2.11	8270C
Bromomethane	0.300	8260B	2-Nitroaniline	2.00 - 2.11	8270C	Indeno(1,2,3-c,d)pyrene	0.200 - 0.211	8270C
Carbon disulfide	1.25	8260B	2-Nitrophenol	2.00 - 2.11	8270C	Isophorone	3.00 - 3.16	8270C
Carbon tetrachloride	0.300	8260B	3,3'-Dichlorobenzidine	2.00 - 2.11	8270C	Naphthalene	0.300 - 0.316	8270C
Chlorobenzene	0.250	8260B	3-Nitroaniline	2.00 - 2.11	8270C	Nitro-benzene	3.00 - 3.16	8270C
Chloroethane	0.300	8260B	4-Bromophenyl phenyl ether	2.00 - 2.11	8270C	Pentachlorophenol	2.00 - 2.11	8270C
Chloroform	0.250	8260B	4-Chloro-3-methylphenol	2.00 - 2.11	8270C	Phenanthrene	0.200 - 0.211	8270C
Chloromethane	0.300	8260B	4-Chlorobenzenamine	2.00 - 2.11	8270C	Phenol	1.00 - 1.05	8270C
Dibromochloromethane	0.300	8260B	4-Chlorophenyl phenyl ether	2.00 - 2.11	8270C	Pyrene	0.300 - 0.316	8270C
Ethyl benzene	0.250	8260B	4-Nitroaniline	3.00 - 3.16	8270C	bis(2-Chloroethoxy)methane	3.00 - 3.16	8270C
Methylene chloride	3.00	8260B	4-Nitrophenol	2.00 - 2.11	8270C	bis(2-Chloroethyl)ether	2.00 - 2.11	8270C
Styrene	0.250	8260B	Acenaphthene	0.310 - 0.326	8270C	bis(2-Ethylhexyl)phthalate	2.00 - 2.11	8270C
Tetrachloroethene	0.300	8260B	Acenaphthylene	0.200 - 0.211	8270C	bis-Chloroisopropyl ether	2.00 - 2.11	8270C
Toluene	0.250	8260B	Anthracene	0.200 - 0.211	8270C	m,p-Cresol	3.00 - 3.16	8270C
Trichloroethene	0.250	8260B	Benzo(a)anthracene	0.200 - 0.211	8270C	n-Nitrosodipropylamine	2.00 - 2.11	8270C
Vinyl acetate	1.50	8260B	Benzo(a)pyrene	0.200 - 0.211	8270C	o-Cresol	2.00 - 2.11	8270C
Vinyl chloride	0.500	8260B	Benzo(b)fluoranthene	0.200 - 0.211	8270C			
Xylene	0.300	8260B	Benzo(ghi)perylene	0.200 - 0.211	8270C			
cis-1,2-Dichloroethene	0.300	8260B	Benzo(k)fluoranthene	0.200 - 0.211	8270C			
cis-1,3-Dichloropropene	0.250	8260B	Butylbenzyl phthalate	2.00 - 2.11	8270C			
trans-1,2-Dichloroethene	0.300	8260B	Carbazole	0.200 - 0.211	8270C			
trans-1,3-Dichloropropene	0.250	8260B	Chrysene	0.200 - 0.211	8270C			

Notes

[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.
µg/L = micrograms per liter.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

Table A-7

Method Detection Limits for High Explosive Compounds (EPA Method SW846-8321A)

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Analyte	MDL (μg/L)
1,3,5-Trinitrobenzene	0.104
1,3-Dinitrobenzene	0.104
2,4,6-Trinitrotoluene	0.104
2,4-Dinitrotoluene	0.104
2,6-Dinitrotoluene	0.0779
2-Amino-4,6-dinitrotoluene	0.104
2-Nitrotoluene	0.104
3-Nitrotoluene	0.104
4-Amino-2,6-dinitrotoluene	0.104
4-Nitrotoluene	0.104
HMX	0.104
Nitro-benzene	0.104
Pentaerythritol tetranitrate	0.130
RDX	0.104
Tetryl	0.130

Notes

μg/L = micrograms per liter.
EPA = U.S. Environmental Protection Agency.
HMX = tetrahexamine tetranitramine.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
RDX = Hexahydro-trinitro-triazine.

Table A-8

Summary of Nitrate plus Nitrite Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3 09-Mar-11	Nitrate plus nitrite as N	5.17	0.100	0.500	10.0			090243-018	EPA 353.2
CTF-MW3 (Duplicate) 09-Mar-11	Nitrate plus nitrite as N	5.54	0.100	0.500	10.0			090244-018	EPA 353.2
SWMU 154									
CTF-MW2 08-Mar-11	Nitrate plus nitrite as N	ND	0.010	0.050	10.0	U		090237-018	EPA 353.2
CTF-MW2 (Duplicate) 08-Mar-11	Nitrate plus nitrite as N	ND	0.010	0.050	10.0	U		090238-018	EPA 353.2

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.
N = Nitrogen.
ND = not detected (at MDL).
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.

Table A-9

Summary of Anion and Alkalinity Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3	Bicarbonate Alkalinity	339	0.725	1.00	NE	B		090243-022	SM2320B
09-Mar-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090243-022	SM2320B
	Bromide	1.15	0.066	0.200	NE			090243-016	SW846 9056
	Chloride	114	1.32	4.00	NE			090243-016	SW846 9056
	Fluoride	2.34	0.033	0.100	4.0			090243-016	SW846 9056
	Sulfate	483	2.00	8.00	NE			090243-016	SW846 9056
CTF-MW3 (Duplicate)	Bicarbonate Alkalinity	341	0.725	1.00	NE	B		090244-022	SM2320B
09-Mar-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090244-022	SM2320B
	Bromide	1.17	0.066	0.200	NE			090244-016	SW846 9056
	Chloride	114	1.32	4.00	NE			090244-016	SW846 9056
	Fluoride	2.35	0.033	0.100	4.0			090244-016	SW846 9056
	Sulfate	487	2.00	8.00	NE			090244-016	SW846 9056
SWMU 154									
CTF-MW2	Bicarbonate Alkalinity	1550	0.725	1.00	NE	B		090237-022	SM2320B
08-Mar-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090237-022	SM2320B
	Bromide	1.51	0.264	0.800	NE			090237-016	SW846 9056
	Chloride	475	1.65	5.00	NE			090237-016	SW846 9056
	Fluoride	2.32	0.132	0.400	4.0			090237-016	SW846 9056
	Sulfate	152	2.50	10.0	NE			090237-016	SW846 9056
CTF-MW2 (Duplicate)	Bicarbonate Alkalinity	1540	0.725	1.00	NE	B		090238-022	SM2320B
08-Mar-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090238-022	SM2320B
	Bromide	1.58	0.264	0.800	NE			090238-016	SW846 9056
	Chloride	477	1.65	5.00	NE			090238-016	SW846 9056
	Fluoride	2.60	0.132	0.400	4.0			090238-016	SW846 9056
	Sulfate	153	2.50	10.0	NE			090238-016	SW846 9056

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.

Table A-9 (Concluded)

Summary of Anion and Alkalinity Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

mg/L = milligrams per liter.
ND = not detected (at MDL).
NE = not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.
U.S. Environmental Protection Agency, Washington, D.C.; or Clesceri, Greenburg, and Eaton, 1998, *Standard Methods for the Examination of Water and Wastewater*, 20th ed., Method 2320B.

Table A-10

Summary of Perchlorate Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Perchlorate Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149								
CTF-MW3 09-Mar-11	ND	0.004	0.012	NE	U		090243-020	EPA 314.0
CTF-MW3 (Duplicate) 09-Mar-11	ND	0.004	0.012	NE	U		090244-020	EPA 314.0
SWMU 154								
CTF-MW2 08-Mar-11	ND	0.004	0.012	NE	U		090237-020	EPA 314.0
CTF-MW2 (Duplicate) 08-Mar-11	ND	0.004	0.012	NE	U		090238-020	EPA 314.0

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.
ND = not detected (at MDL).
NE = not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1999 (and updates), *"Perchlorate in Drinking Water Using Ion Chromatography,"* EPA 815/R-00-014.

Table A-11

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3	Aluminum	ND	0.015	0.050	NE	U		090243-009	SW846 6020
09-Mar-11	Antimony	ND	0.001	0.003	0.006	U		090243-009	SW846 6020
	Arsenic	0.00232	0.0017	0.005	0.010	J		090243-009	SW846 6020
	Barium	0.0303	0.0006	0.002	2.00			090243-009	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090243-009	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090243-009	SW846 6020
	Calcium	178	0.300	1.00	NE			090243-009	SW846 6020
	Chromium	0.00371	0.002	0.010	0.100	B, J	0.022U	090243-009	SW846 6020
	Cobalt	0.00126	0.0001	0.001	NE			090243-009	SW846 6020
	Copper	0.00158	0.00035	0.001	NE		0.0020U	090243-009	SW846 6020
	Iron	1.26	0.033	0.100	NE	B		090243-009	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090243-009	SW846 6020
	Magnesium	43.4	0.010	0.030	NE			090243-009	SW846 6020
	Manganese	0.00144	0.001	0.005	NE	J	0.0063U	090243-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090243-009	SW846 7470
	Nickel	0.0106	0.0005	0.002	NE	B		090243-009	SW846 6020
	Potassium	10.3	0.080	0.300	NE			090243-009	SW846 6020
	Selenium	0.0209	0.0015	0.005	0.050			090243-009	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090243-009	SW846 6020
	Sodium	149	0.400	1.25	NE			090243-009	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090243-009	SW846 6020
	Vanadium	ND	0.003	0.010	NE	U		090243-009	SW846 6020
	Zinc	0.00571	0.0035	0.010	NE	J		090243-009	SW846 6020

Refer to footnotes at end of table.

Table A-11 (Continued)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3 (Duplicate) 09-Mar-11	Aluminum	ND	0.015	0.050	NE	U		090244-009	SW846 6020
	Antimony	ND	0.001	0.003	0.006	U		090244-009	SW846 6020
	Arsenic	0.00265	0.0017	0.005	0.010	J		090244-009	SW846 6020
	Barium	0.0309	0.0006	0.002	2.00			090244-009	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090244-009	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090244-009	SW846 6020
	Calcium	172	0.300	1.00	NE			090244-009	SW846 6020
	Chromium	ND	0.002	0.010	0.100	U		090244-009	SW846 6020
	Cobalt	0.000967	0.0001	0.001	NE	J		090244-009	SW846 6020
	Copper	0.00182	0.00035	0.001	NE		0.0020U	090244-009	SW846 6020
	Iron	1.30	0.033	0.100	NE	B		090244-009	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090244-009	SW846 6020
	Magnesium	46.5	0.010	0.030	NE			090244-009	SW846 6020
	Manganese	ND	0.001	0.005	NE	U		090244-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090244-009	SW846 7470
	Nickel	0.00949	0.0005	0.002	NE	B		090244-009	SW846 6020
	Potassium	10.5	0.080	0.300	NE			090244-009	SW846 6020
	Selenium	0.0236	0.0015	0.005	0.050			090244-009	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090244-009	SW846 6020
	Sodium	144	0.400	1.25	NE			090244-009	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090244-009	SW846 6020
	Vanadium	ND	0.003	0.010	NE	U		090244-009	SW846 6020
	Zinc	0.00416	0.0035	0.010	NE	J		090244-009	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.

Table A-11 (Concluded)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

ND = not detected (at MDL).
NE = not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-12
Summary of Filtered Total Metal Results
Solid Waste Management Unit 149 Groundwater Monitoring
Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3	Aluminum	ND	0.015	0.050	NE	U		090243-010	SW846 6020
09-Mar-11	Antimony	ND	0.001	0.003	0.006	U		090243-010	SW846 6020
	Arsenic	0.00418	0.0017	0.005	0.010	J		090243-010	SW846 6020
	Barium	0.0307	0.0006	0.002	2.00			090243-010	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090243-010	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090243-010	SW846 6020
	Calcium	171	0.300	1.00	NE			090243-010	SW846 6020
	Chromium	0.00466	0.002	0.010	0.100	B,J	0.022U	090243-010	SW846 6020
	Cobalt	0.00119	0.0001	0.001	NE			090243-010	SW846 6020
	Copper	0.00166	0.00035	0.001	NE			090243-010	SW846 6020
	Iron	1.38	0.033	0.100	NE	B		090243-010	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090243-010	SW846 6020
	Magnesium	45.9	0.010	0.030	NE			090243-010	SW846 6020
	Manganese	ND	0.001	0.005	NE	U		090243-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090243-010	SW846 7470
	Nickel	0.0102	0.0005	0.002	NE	B		090243-010	SW846 6020
	Potassium	9.98	0.080	0.300	NE			090243-010	SW846 6020
	Selenium	0.0206	0.0015	0.005	0.050			090243-010	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090243-010	SW846 6020
	Sodium	145	0.400	1.25	NE			090243-010	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090243-010	SW846 6020
	Vanadium	ND	0.003	0.010	NE	U		090243-010	SW846 6020
	Zinc	0.00381	0.0035	0.010	NE	J		090243-010	SW846 6020

Refer to footnotes at end of table.

Table A-12 (Continued)

Summary of Filtered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3 (Duplicate) 09-Mar-11	Aluminum	ND	0.015	0.050	NE	U		090244-010	SW846 6020
	Antimony	ND	0.001	0.003	0.006	U		090244-010	SW846 6020
	Arsenic	0.00543	0.0017	0.005	0.010			090244-010	SW846 6020
	Barium	0.0309	0.0006	0.002	2.00			090244-010	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090244-010	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090244-010	SW846 6020
	Calcium	179	0.300	1.00	NE			090244-010	SW846 6020
	Chromium	0.00416	0.002	0.010	0.100	B, J	0.022U	090244-010	SW846 6020
	Cobalt	0.00121	0.0001	0.001	NE			090244-010	SW846 6020
	Copper	0.00179	0.00035	0.001	NE			090244-010	SW846 6020
	Iron	1.35	0.033	0.100	NE	B		090244-010	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090244-010	SW846 6020
	Magnesium	48.8	0.010	0.030	NE			090244-010	SW846 6020
	Manganese	ND	0.001	0.005	NE	U		090244-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090244-010	SW846 7470
	Nickel	0.0104	0.0005	0.002	NE	B		090244-010	SW846 6020
	Potassium	10.4	0.080	0.300	NE			090244-010	SW846 6020
	Selenium	0.0203	0.0015	0.005	0.050			090244-010	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090244-010	SW846 6020
	Sodium	154	0.400	1.25	NE			090244-010	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090244-010	SW846 6020
	Vanadium	ND	0.003	0.010	NE	U		090244-010	SW846 6020
	Zinc	0.00406	0.0035	0.010	NE	J		090244-010	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.
mg/L = milligrams per liter.
ND = not detected (at MDL).

Table A-12 (Concluded)

Summary of Filtered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

NE = not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-13

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2	Aluminum	0.381	0.075	0.250	NE			090237-009	SW846 6020
08-Mar-11	Antimony	ND	0.005	0.015	0.006	U		090237-009	SW846 6020
	Arsenic	**0.0595**	0.0085	0.025	0.010			090237-009	SW846 6020
	Barium	0.0848	0.003	0.010	2.00			090237-009	SW846 6020
	Beryllium	0.00175	0.001	0.0025	0.004	J		090237-009	SW846 6020
	Cadmium	ND	0.00055	0.005	0.005	U		090237-009	SW846 6020
	Calcium	381	3.00	10.0	NE	B		090237-009	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090237-009	SW846 6020
	Cobalt	0.00772	0.0005	0.005	NE			090237-009	SW846 6020
	Copper	0.00182	0.00175	0.005	NE	J	0.017U	090237-009	SW846 6020
	Iron	3.18	0.165	0.500	NE			090237-009	SW846 6020
	Lead	ND	0.0025	0.010	NE	U		090237-009	SW846 6020
	Magnesium	87.2	0.050	0.150	NE			090237-009	SW846 6020
	Manganese	3.24	0.005	0.025	NE		J	090237-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090237-009	SW846 7470
	Nickel	0.0215	0.0025	0.010	NE			090237-009	SW846 6020
	Potassium	50.2	0.400	1.50	NE			090237-009	SW846 6020
	Selenium	ND	0.0075	0.025	0.050	U		090237-009	SW846 6020
	Silver	ND	0.001	0.005	NE	U		090237-009	SW846 6020
	Sodium	463	4.00	12.5	NE			090237-009	SW846 6020
	Thallium	**0.00249**	0.00225	0.010	0.002	J		090237-009	SW846 6020
	Uranium	0.0292	0.000335	0.001	0.03			090237-009	SW846 6020
	Vanadium	ND	0.015	0.050	NE			090237-009	SW846 6020
	Zinc	ND	0.0175	0.050	NE	U		090237-009	SW846 6020

Refer to footnotes at end of table.

Table A-13 (Continued)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2 (Duplicate) 08-Mar-11	Aluminum	0.312	0.075	0.250	NE			090238-009	SW846 6020
	Antimony	ND	0.005	0.015	0.006	U		090238-009	SW846 6020
	Arsenic	**0.053**	0.0085	0.025	0.010		0.058U	090238-009	SW846 6020
	Barium	0.0765	0.003	0.010	2.00			090238-009	SW846 6020
	Beryllium	0.00132	0.001	0.0025	0.004	J		090238-009	SW846 6020
	Cadmium	ND	0.00055	0.005	0.005	U		090238-009	SW846 6020
	Calcium	406	3.00	10.0	NE	B		090238-009	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090238-009	SW846 6020
	Cobalt	0.00726	0.0005	0.005	NE			090238-009	SW846 6020
	Copper	ND	0.00175	0.005	NE	U		090238-009	SW846 6020
	Iron	2.86	0.165	0.500	NE			090238-009	SW846 6020
	Lead	ND	0.0025	0.010	NE	U		090238-009	SW846 6020
	Magnesium	81.8	0.050	0.150	NE			090238-009	SW846 6020
	Manganese	3.08	0.005	0.025	NE		J	090238-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090238-009	SW846 7470
	Nickel	0.0194	0.0025	0.010	NE			090238-009	SW846 6020
	Potassium	47.4	0.400	1.50	NE			090238-009	SW846 6020
	Selenium	ND	0.0075	0.025	0.050	U		090238-009	SW846 6020
	Silver	ND	0.001	0.005	NE	U		090238-009	SW846 6020
	Sodium	482	4.00	12.5	NE			090238-009	SW846 6020
	Thallium	ND	0.00225	0.010	0.002	U		090238-009	SW846 6020
	Uranium	0.0264	0.000335	0.001	0.03			090238-009	SW846 6020
	Vanadium	ND	0.015	0.050	NE	U		090238-009	SW846 6020
	Zinc	ND	0.0175	0.050	NE	U		090238-009	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.
ND = not detected (at MDL).
NE = not established.

Table A-13 (Concluded)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = The associated value is an estimate and may be inaccurate or imprecise.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-14

Summary of Filtered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2	Aluminum	0.0838	0.075	0.250	NE	J	1.5UJ	090237-010	SW846 6020
08-Mar-11	Antimony	ND	0.005	0.015	0.006	U		090237-010	SW846 6020
	Arsenic	**0.0544**	0.0085	0.025	0.010			090237-010	SW846 6020
	Barium	0.0797	0.003	0.010	2.00			090237-010	SW846 6020
	Beryllium	0.00168	0.001	0.0025	0.004	J		090237-010	SW846 6020
	Cadmium	ND	0.00055	0.005	0.005	U		090237-010	SW846 6020
	Calcium	389	3.00	10.0	NE	B		090237-010	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090237-010	SW846 6020
	Cobalt	0.00774	0.0005	0.005	NE			090237-010	SW846 6020
	Copper	ND	0.00175	0.005	NE	U		090237-010	SW846 6020
	Iron	2.43	0.165	0.500	NE			090237-010	SW846 6020
	Lead	ND	0.0025	0.010	NE	U		090237-010	SW846 6020
	Magnesium	87.6	0.050	0.150	NE			090237-010	SW846 6020
	Manganese	3.23	0.005	0.025	NE		J	090237-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090237-010	SW846 7470
	Nickel	0.0207	0.0025	0.010	NE			090237-010	SW846 6020
	Potassium	50.6	0.400	1.50	NE			090237-010	SW846 6020
	Selenium	ND	0.0075	0.025	0.050	U		090237-010	SW846 6020
	Silver	ND	0.001	0.005	NE	U		090237-010	SW846 6020
	Sodium	477	4.00	12.5	NE			090237-010	SW846 6020
	Thallium	ND	0.00225	0.010	0.002	U		090237-010	SW846 6020
	Uranium	0.0281	0.000335	0.001	0.03			090237-010	SW846 6020
	Vanadium	ND	0.015	0.050	NE	U		090237-010	SW846 6020
	Zinc	ND	0.0175	0.050	NE	U		090237-010	SW846 6020

Refer to footnotes at end of table.

Table A-14 (Continued)

Summary of Filtered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2 (Duplicate) 08-Mar-11	Aluminum	ND	0.075	0.250	NE	U	1.5UJ	090238-010	SW846 6020
	Antimony	ND	0.005	0.015	0.006	U		090238-010	SW846 6020
	Arsenic	**0.0521**	0.0085	0.025	0.010			090238-010	SW846 6020
	Barium	0.0768	0.003	0.010	2.00			090238-010	SW846 6020
	Beryllium	0.00139	0.001	0.0025	0.004	J		090238-010	SW846 6020
	Cadmium	ND	0.00055	0.005	0.005	U		090238-010	SW846 6020
	Calcium	398	3.00	10.0	NE	B		090238-010	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090238-010	SW846 6020
	Cobalt	0.0077	0.0005	0.005	NE			090238-010	SW846 6020
	Copper	ND	0.00175	0.005	NE	U		090238-010	SW846 6020
	Iron	2.63	0.165	0.500	NE			090238-010	SW846 6020
	Lead	ND	0.0025	0.010	NE	U		090238-010	SW846 6020
	Magnesium	85.3	0.050	0.150	NE			090238-010	SW846 6020
	Manganese	3.23	0.005	0.025	NE		J	090238-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090238-010	SW846 7470
	Nickel	0.0207	0.0025	0.010	NE			090238-010	SW846 6020
	Potassium	49.9	0.400	1.50	NE			090238-010	SW846 6020
	Selenium	ND	0.0075	0.025	0.050	U		090238-010	SW846 6020
	Silver	ND	0.001	0.005	NE	U		090238-010	SW846 6020
	Sodium	495	4.00	12.5	NE			090238-010	SW846 6020
	Thallium	ND	0.00225	0.010	0.002	U		090238-010	SW846 6020
	Uranium	0.0266	0.000335	0.001	0.03			090238-010	SW846 6020
	Vanadium	ND	0.015	0.050	NE	U		090238-010	SW846 6020
	Zinc	ND	0.0175	0.050	NE	U		090238-010	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.
ND = not detected (at MDL).

Table A-14 (Concluded)

Summary of Filtered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

NE = not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = The associated numerical value is an estimated quantity.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-15

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analyte	Activity[a] (pCi/L)	MDA (pCi/L)	Critical Level[b] (pCi/L)	MCL (pCi/L)	Laboratory Qualifier[c]	Validation Qualifier[d]	Sample No.	Analytical Method[e]
CTF-MW2	Americium-241	7.56 ± 8.62	12.0	6.02	NE	U	BD	090237-033	EPA 901.1
08-Mar-11	Cesium-137	-0.642 ± 1.66	2.64	1.32	NE	U	BD	090237-033	EPA 901.1
	Cobalt-60	0.737 ± 1.75	2.93	1.47	NE	U	BD	090237-033	EPA 901.1
	Potassium-40	69.9 ± 43.1	28.5	14.3	NE		J	090237-033	EPA 901.1
	Gross Alpha	-0.08	NA	NA	15		None	090237-034	EPA 900.0
	Gross Beta	88.7 ± 17.3	11.9	5.79	4mrem/yr			090237-034	EPA 900.0
	Uranium-233/234	58.1 ± 8.18	0.111	0.0484	NE			090237-035	HASL-300
	Uranium-235/236	1.38 ± 0.267	0.071	0.0268	NE			090237-035	HASL-300
	Uranium-238	9.20 ± 1.35	0.0756	0.0308	NE			090237-035	HASL-300
CTF-MW2 (Duplicate)	Americium-241	-1.95 ± 3.56	4.91	2.46	NE	U	BD	090238-033	EPA 901.1
08-Mar-11	Cesium-137	4.15 ± 3.13	4.41	2.20	NE	U	BD	090238-033	EPA 901.1
	Cobalt-60	0.890 ± 2.33	4.02	2.01	NE	U	BD	090238-033	EPA 901.1
	Potassium-40	84.6 ± 32.9	35.5	17.8	NE		J	090238-033	EPA 901.1
	Gross Alpha	-1.71	NA	NA	15		None	090238-034	EPA 900.0
	Gross Beta	75.2 ± 14.6	9.32	4.51	4mrem/yr			090238-034	EPA 900.0
	Uranium-233/234	55.5 ± 8.13	0.107	0.0465	NE			090238-035	HASL-300
	Uranium-235/236	0.906 ± 0.197	0.0683	0.0258	NE			090238-035	HASL-300
	Uranium-238	8.60 ± 1.31	0.0726	0.0296	NE			090238-035	HASL-300

Notes

CFR = Code of Federal Regulations.
EPA = U.S. Environmental Protection Agency.
HASL = Health and Safety Laboratory.
MCL = Maximum contaminant level. The following are the MCLs for gross alpha particles and beta particles in community water systems:
15 pCi/L = Gross alpha particle activity, excluding total uranium (40 CFR Parts 9, 141, and 142, Table I-4)
4 mrem/yr = any combination of beta and/or gamma emitting radionuclides (as dose rate).
MDA = The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
NA = not applicable for gross alpha activities. The MDA or critical level could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.
NE = not established.
pCi/L = picocuries per liter.

Table A-15 (Concluded)

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Notes (continued)

[a]Activities of zero or less are considered to be not detected. Gross alpha activity measurements were corrected by subtracting out the total uranium activity (40 CFR Parts 9, 141, and 142, Table I-4).

[b]The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions. The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.

[c]**Laboratory Qualifier**
U = Analyte is absent or below the MDA.

[d]**Validation Qualifier**
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
BD = Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J = The associated numerical value is an estimated quantity.

[e]**Analytical Method**
U.S. Environmental Protection Agency, 1980, "*Prescribed Procedures for Measurement of Radioactivity in Drinking Water,"* EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio
U.S. Department of Energy, Environmental Measurements Laboratory, 1990, *"EML Procedures Manual,"* 27th ed., Vol. 1, Rev. 1992, HASL-300.

Table A-16

Summary of Constituents Detected Above Established MCLs

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, January 2011 – March 2011

Well ID	Analysis	Analyte	Result[a] (mg/L)	MCL (mg/L)	Laboratory Qualifier[b]	Validation Qualifier[c]	Sample No.	Analytical Method[d]
SWMU 154								
CTF-MW2 08-Mar-11	Unfiltered Total Metals	Arsenic	**0.0595**	0.010			090237-009	SW846 6020
	Unfiltered Total Metals	Thallium	**0.00249**	0.002	J		090237-009	SW846 6020
CTF-MW2 (Duplicate) 08-Mar-11	Unfiltered Total Metals	Arsenic	**0.053**	0.010		0.058U	090238-009	SW846 6020
CTF-MW2 08-Mar-11	Filtered Total Metals	Arsenic	**0.0544**	0.010			090237-010	SW846 6020
CTF-MW2 (Duplicate) 08-Mar-11	Filtered Total Metals	Arsenic	**0.0521**	0.010			090238-010	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = milligrams per liter.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Values in bold exceed the MCL.

[b]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

[c]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

[d]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-17
Duplicate Sample Analytical Results for Chemical Analyses
Solid Waste Management Unit 149 Groundwater Monitoring
Quarterly Assessment, January 2011 – March 2011

Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD
	mg/L unless otherwise noted		
CTF-MW3			
Nitrate plus Nitrite	5.17	5.54	7
Bicarbonate Alkalinity	339	341	1
Bromide	1.15	1.17	2
Chloride	114	114	<1
Fluoride	2.34	2.35	<1
Sulfate	483	487	1
Arsenic	0.00232	0.00265	13
Barium	0.0303	0.0309	2
Calcium	178	172	3
Cobalt	0.00126	0.000967	26
Iron	1.26	1.30	3
Magnesium	43.4	46.5	7
Nickel	0.0106	0.00949	11
Potassium	10.3	10.5	2
Selenium	0.0209	0.0236	12
Sodium	149	144	3
Zinc	0.00571	0.004160	31
Arsenic (filtered)	0.00418	0.00543	26
Barium (filtered)	0.0307	0.0309	1
Calcium (filtered)	171	179	5
Cobalt (filtered)	0.00119	0.00121	2
Copper (filtered)	0.00166	0.00179	8
Iron (filtered)	1.38	1.35	2
Magnesium (filtered)	45.9	48.8	6
Nickel (filtered)	0.0102	0.0104	2
Potassium (filtered)	9.98	10.4	4
Selenium (filtered)	0.0206	0.0203	1
Sodium (filtered)	145	154	6
Zinc (filtered)	0.00381	0.00406	6

Notes

CTF = Coyote Test Field.
mg/L = milligrams per liter.
RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number:

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2)/2]} \times 100$$

where:

R_1 = analysis result.
R_2 = duplicate analysis result.

Table A-18
Duplicate Sample Analytical Results for Chemical Analyses
Solid Waste Management Unit 154 Groundwater Monitoring
Quarterly Assessment, January 2011 – March 2011

Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD
	mg/L unless otherwise noted		
CTF-MW2			
RDX (μg/L)	0.298	0.372	22
Bicarbonate Alkalinity	1550	1540	1
Bromide	1.51	1.58	5
Chloride	475	477	< 1
Fluoride	2.32	2.60	11
Sulfate	152	153	1
Aluminum	0.381	0.312	20
Arsenic	0.0595	ND	NC
Barium	0.0848	0.0765	10
Beryllium	0.00175	0.00132	28
Calcium	381	406	6
Cobalt	0.00772	0.00726	6
Iron	3.18	2.86	11
Magnesium	87.2	81.8	6
Manganese	3.24	3.08	5
Nickel	0.0215	0.0194	10
Potassium	50.2	47.4	6
Sodium	463	482	4
Uranium	0.0292	0.0264	10
Arsenic (filtered)	0.0544	0.0521	4
Barium (filtered)	0.0797	0.0768	4
Beryllium (filtered)	0.00168	0.00139	19
Calcium (filtered)	389	398	2
Cobalt (filtered)	0.00774	0.0077	1
Iron (filtered)	2.43	2.63	8
Magnesium (filtered)	87.6	85.3	3
Manganese (filtered)	3.23	3.23	< 1
Nickel (filtered)	0.0207	0.0207	< 1
Potassium (filtered)	50.6	49.9	1
Sodium (filtered)	477	495	4
Uranium (filtered)	0.0281	0.0266	5

Notes

μg/L = micrograms per liter.
CTF = Coyote Test Field.
mg/L = milligrams per liter.
RDX = hexahydro-trinitro-triazine.
RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number.

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2)/2]} \times 100$$

where:

R_1 = analysis result.
R_2 = duplicate analysis result.

Attachment 1
Field Measurement Logs and Documentation

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: **CTF-MW2** Date: 3/8/11 Time: 0748

Activities: Ground Water monitoring/ sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampoules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.	☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.	☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.	☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.	☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.	☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	[signature]
ALFRED SANTILLANES	[signature]
William Gibson	[signature]

Printed Name _____ Signature _____

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: SWMU	Monitoring Well ID # CTF-MW2	Date: 3/08/11

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: Pump 2	Water Level Indicator ID#: 56159
Personnel Performing Decontamination: Print Name: Robert Lynch RL Initial: Print Name: Alfred Santillanes AS Initial:	Personnel Performing Decontamination: Print Name : Robert Lynch RL Initial: Print Name Alfred Santillanes AS Initial

Condition of Equipment

Pump: Good Tubing Bundle: Good Water Level Indicator: Good

List of Decontamination Materials

Distilled or **Deionized** (circle one) **Source: Culligan** **Lot Number: 02- 24 -11** **EB-2;CoC 613447 taken prior to CTF-MW2 purge.**	**HNO_3** **Grade: Reagent** **UN #: 2031** **Manufacture: Fisher** **Lot Number: 002735**

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: **SWMU**	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 03/08/11

Make & Model:

YSI 6920-V Sonde (S/N: 99J0064) with DO, Ec, pH, ORP, and temperature probes: _____

YSI 650 MDS (S/N): _08H100440_____

pH Calibration

pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0644	4.03	18.5	6.99	18.5	9.99	18.5
2. Time: 1148	4.01	18.6	6.98	18.4	10.00	18.6
3. Time:						
4. Time:						
Standard lot no.:054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278			Standard Lot No.: 1710737
	Value	Temp	Expiration Date: 12/12
1. Time: 0640	1275	18.5	Date: 03/08/11
2. Time: 1144	1274	18.6	
3. Time:			
4. Time:			Initials:

ORP Calibration

Reference Value: 200.0			Standard Lot No. 03K0868			
	Value	Temp	Expiration Date: 12/12			
1. Time: 0642	199.7	18.5	Value	Temp	Value	Temp
2. Time: 1146	199.6	18.6				
3. Time:						
4. Time:						

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0639	80.3	24.05
2. Time: 1143	80.2	24.04
3. Time:		
4. Time:		

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Alkanity = 770

Project Name: TAG	Project No.:
Well I.D.: CTF-MW2	Date: 03/08/11
Well Condition:	Weather Condition: Cloudy, Cold
Method: Portable pump X	Dedicated pump ____ Pump depth: 132'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
43.57	0802		Start						
46.09	0822	5	14.79	2513	176.7	6.18	53.7	4.1	0.42
45.83	0839	10	14.01	2450	177.2	6.39	47.6	4.1	0.41
46.14	0857	15	13.90	2456	171.2	6.38	43.7	3.5	0.36
46.60	0910	20	14.56	2946	134.6	6.03	22.9	2.4	0.24
46.66	0923	25	14.60	3220	92.4	6.01	24.1	2.6	0.25
46.91	0938	30	14.48	3281	69.6	6.01	23.8	1.7	0.17
46.97	0950	35	14.41	3321	64.3	6.02	23.6	1.7	0.17
46.95	0955	37	14.40	3328	64.8	6.03	23.6	1.7	0.17
46.99	1000	39	14.10	3327	65.2	6.03	24.0	1.6	0.16
47.00	1006	41	14.12	3324	65.0	6.03	23.5	1.8	0.19
	1007		Sampling						
									24.00 gal purged prior to measurements 0810

SNL/NM Project Name: **SWMU**	Project No.: 146422.10.11.01
Calibration done by: RL	Date:03/08/11
TURBIDIMETER	
Make & Model: HACH 2100Q	Serial No. 10050C002897

Reference Value	10	20	100	800
Standard Lot No.				
1. Time 0752	9.6	19.9	101	798
2. Time 1034	9.8	20.4	103	799
3. Time				
4. Time				

Comments:

LTES Groundwater Monitoring Waste Generation Log

Waste Generator : Alfred Santillanes **Phone:** 844-5130 **Project Leader**: Don Schofield

Project Name	SWMU/GWPP-GWM	SWMU/GWPP-GWM	SWMU/GWPP-GWM
Container ID # (site-date-sequence)	CTF-MW2-030811-01	CTF-MW2-030811-02	CTF-030811
Initial Label Type (Hazardous or Non-Regulated)	Non- Regulated	Non- Regulated	Non- Regulated
Waste Matrix (purge water, decon water, HACH Accu-Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	55 CHPD	55 CHPD	55 CHPD
Volume of Waste	24 gal.	21 gal.	30 gal.
Total Container Weight	200 lbs.	180 lbs.	300 lbs.
COC#: Sample#-Fraction	CoC#: 613448,613457 Sample#:090237,090238 090273	CoC#: 613448,613457 Sample#:090237,090238 090273	CoC#: 613448 Sample#:090237,090238 090273
Accumulation Date	Start:03\08\11 Full:03\08\11	Start:03\08\11 Full:03\08\11	Start:03\08\11 Full:03\08\11
Date Waste Moved to Accumulation Area	03\08\11	03\08\11	03\08\11
Accumulation Area Name	9925	9925	9925
Comments:			Decon after CTF-MW2 purge. CoC 613448, 613457

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CTF-MW3 Date: 3/9/11 Time: 0747

Activities: Ground Water monitoring/ sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampoules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.	☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.	☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.	☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.	☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.	☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	[signature]
William Gibson	[signature]

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: SWMU	Monitoring Well ID # CTF-MW3	Date: 3/09/11

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: Pump 2	Water Level Indicator ID#: 56159
Personnel Performing Decontamination: Print Name: William Gibson WJG Initial: Print Name: Alfred Santillanes Initial:	Personnel Performing Decontamination: Print Name : William Gibson WJG Initial: Print Name Alfred Santillanes Initial

Condition of Equipment

Pump: Good Tubing Bundle: Good Water Level Indicator: Good

List of Decontamination Materials

Distilled or **Deionized** (circle one) **Source: Culligan** **Lot Number: 02- 24 -11** **EB-1;CoC 613445 taken prior to CYN-MW5 purge.**	**HNO_3** **Grade: Reagent** **UN #: 2031** **Manufacture: Fisher** **Lot Number: 002735**

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: SWMU	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 03/09/11

Make & Model:

YSI 6920-V Sonde (S/N: 99J0064) with DO, Ec, pH, ORP, and temperature probes: _____

YSI 650 MDS (S/N): _08H100440_____

pH Calibration

pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0638	3.99	18.0	7.00	17.9	10.00	17.9
2. Time: 1147	4.01	18.3	7.02	18.3	10.03	18.3
3. Time:						
4. Time:						
Standard lot no.:054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278			Standard Lot No.: 1710737
	Value	Temp	Expiration Date: 12/12
1. Time: 0635	1275	17.8	Date: 03/09/11
2. Time: 1143	1277	18.3	
3. Time:			
4. Time:			more probes:

ORP Calibration

Reference Value: 200.0			Standard Lot No. 03K0868			
	Value	Temp	Expiration Date: 12/12			
1. Time: 0636	199.7	17.8	Value	Temp	Value	Temp
2. Time: 1145	200.4	18.3				
3. Time:						
4. Time:						

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0634	81.7	24.47
2. Time: 1142	81.6	24.49
3. Time:		
4. Time:		

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Alkanity = 270

Project Name: TAG	Project No.:
Well I.D.: CTF-MW3	Date: 03/09/11
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump ____ Pump depth: 362'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
306.82	0803		START						
313.95	0833	5	16.66	1595	421.8	6.86	0.87	74.5	7.22
316.49	0847	10	17.33	1597	421.8	6.91	0.60	76.2	7.26
319.15	0859	15	17.68	1598	399.8	6.92	0.23	75.7	7.15
321.21	0913	20	17.87	1599	421.0	6.92	0.35	76.4	6.65
322.60	0927	25	18.12	1597	422.6	6.92	0.41	71.7	6.74
323.28	0936	28	18.36	1599	422.9	6.92	0.39	72.6	6.77
323.85	0946	31	18.50	1602	421.4	6.92	0.29	75.3	7.01
324.14	0951	33	18.52	1605	422.8	6.92	0.28	71.9	6.70
324.41	0958	35	18.58	1605	423.7	6.91	0.20	73.3	6.83
	0959		Sampling						
									~4.00 gal purged prior to measurement 0819

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued)

SNL/NM Project Name: **SWMU**	Project No.: 146422.10.11.01
Calibration done by: RL	Date:03/09/11

TURBIDIMETER

Make & Model: HACH 2100Q	Serial No. 10050C002897

Reference Value	10	20	100	800
Standard Lot No.				
1. Time 0753	9.7	19.8	99.7	800
2. Time 1021	9.6	19.6	99.9	802
3. Time				
4. Time				

Comments:

LTES Groundwater Monitoring Waste Generation Log

Waste Generator : William Gibson **Phone:** 239-7367 **Project Leader:** Don Schofield

Project Name	SWMU/GWPP-GWM	SWMU/GWPP-GWM	SWMU/GWPP-GWM
Container ID # (site-date-sequence)	CTF-MW3-030911-01	CTF-MW3-030911-02	CTF-030911
Initial Label Type (Hazardous or Non-Regulated)	Non- Regulated	Non- Regulated	Non- Regulated
Waste Matrix (purge water, decon water, HACH Accu-Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	55 CHPD	55 CHPD	55 CHPD
Volume of Waste	24 gal.	19 gal.	30 gal.
Total Container Weight	200 lbs.	180 lbs.	300 lbs.
COC#: Sample#-Fraction	CoC#: 613450,613459 Sample#:090243,090244, 090275	CoC#: 613450,613459 Sample#:090243,090244, 090275	CoC#: 613450,613459 Sample#:090243,090244, 090275
Accumulation Date	Start:03\09\11 Full:03\09\11	Start:03\09\11 Full:03\09\11	Start:03\09\11 Full:03\09\11
Date Waste Moved to Accumulation Area	03\09\11	03\09\11	03\09\11
Accumulation Area Name	9925	9925	9925
Comments:			Decon after CTF-MW3 purge. CoC 613450, 613459

Attachment 2
Analysis Request/Chain-of-Custody Forms

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 613450

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	3/9/11	Project/Task No.98026.01.14	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	24514	SMO Authorization:	
Project Name:	SWMU-149	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL		☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF 250-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				273689

SMO BOTTLE ORDER

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090243-001	CTF-MW3	362	NA	030911\0959	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090243-009	CTF-MW3	362	NA	030911\1000	GW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	002
090243-010	CTF-MW3	362	NA	030911\1001	FGW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	003
090243-016	CTF-MW3	362	NA	030911\1002	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	004
090243-018	CTF-MW3	362	NA	030911\1003	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	005
090243-020	CTF-MW3	362	NA	030911\1004	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	006
090243-022	CTF-MW3	362	NA	030911\1005	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	007
090244-001	CTF-MW3	362	NA	030911\0959	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	008
090244-009	CTF-MW3	362	NA	030911\1000	GW	P	500 ml	HNO3	G	DU	TAL Metals (SW846-6020/7470)	009
090244-010	CTF-MW3	362	NA	030911\1001	FGW	P	500 ml	HNO3	G	DU	TAL Metals (SW846-6020/7470)	010
090244-016	CTF-MW3	362	NA	030911\1002	GW	P	250ml	4C	G	DU	Anions (SW846-9056)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:
QC inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by	Org. 4142	Date 3/9/11	Time 1118	4.Relinquished by	Org.	Date	Time
1. Received by SMO	Org. 4142	Date 3/9/11	Time 1118	4. Received by	Org.	Date	Time
2.Relinquished by SMO	Org. 4142	Date 3/9/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by	Org. GEL	Date 3/10/11	Time ~~0900~~	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time 0805	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613450

Project Name:	SWMU-149	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.14
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090244-018	CTF-MW3	362	NA	030911\1003	GW	P	250ml	H2SO4	G	DU	NPN (353.2)	012
090244-020	CTF-MW3	362	NA	030911\1004	GW	P	500ml	4C	G	DU	Perchlorate (314.0)	013
090244-022	CTF-MW3	362	NA	030911\1005	GW	P	500ml	4C	G	DU	Alkalinity (SM2320B)	014
090245-001	CTF-TB7	NA	NA	030911\0959	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	015
090246-001	CTF-FB3	NA	NA	030911\0944	DIW	G	3x40ml	HCL	G	FB	VOC (SW846-8260B)	016

Abnormal Conditions on Receipt

LAB USE

Recipient Initials KL

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: SNLS	**SDG/AR/COC/Work Order:** 613450
Received By: KC	**Date Received:** 3/10/11

Suspected Hazard Information	**Yes**	**No**	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		✓	Maximum Counts Observed*: 20 cpm
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
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)?	✓			4c Preservation Method: Ice bags Blue ice Dry ice None Other (describe)
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 41502182 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:
12	COC form is properly signed in relinquished/received sections?	✓			
13	Carrier and tracking number.	✓			1st overnight Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 9859 3933 6093

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EM Date 3/10/11 Page 1 of 1

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 613449

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	3/9/11	Project/Task No.98026.01.14	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	12451 4	SMO Authorization:	
Project Name:	SWMU-149	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436 SMO	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL		☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	SEE BOTTLE ORDER	Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF 250-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				273689

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090241-001	CTF-EB3	NA	NA	030811\1400	DIW	G	3x40ml	HCL	G	EB	TCL VOC (SW846-8260B)	017
090241-009	CTF-EB3	NA	NA	030811\1401	DIW	P	500 ml	HNO3	G	EB	TAL Metals (SW846-6020/7470)	018
090241-010	CTF-EB3	NA	NA	030811\1402	FDIW	P	500 ml	HNO3	G	EB	TAL Metals (SW846-6020/7470)	019
090241-016	CTF-EB3	NA	NA	030811\1403	DIW	P	250ml	4C	G	EB	Anions (SW846-9056)	020
090241-018	CTF-EB3	NA	NA	030811\1404	DIW	P	250ml	H2SO4	G	EB	NPN (353.2)	021
090241-020	CTF-EB3	NA	NA	030811\1405	DIW	P	500ml	4C	G	EB	Perchlorate (314.0)	022
090241-022	CTF-EB3	NA	NA	030811\1406	DIW	P	500ml	4C	G	EB	Alkalinity (SM2320B)	023
090242-001	CTF-TB6	NA	NA	030811\1400	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	024

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy):
Entered by:
QC inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch			Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by	Org. 4142	Date 3/9/11	Time 1122	4.Relinquished by	Org.	Date	Time
1. Received by SMO	Org. 4142	Date 3/9/11	Time 1122	4. Received by	Org.	Date	Time
2.Relinquished by SMO	Org. 4142	Date 3/9/11	Time 1130	5.Relinquished by	Org.	Date	Time
2. Received by	Org. GEL	Date 3/10/11	Time 0900	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time 0805	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time EM	6. Received by	Org.	Date	Time

3/10/11

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: SNLS	**SDG/AR/COC/Work Order:** 613449
Received By: KC	**Date Received:** 3/10/11

Suspected Hazard Information	**Yes**	**No**	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		✓	Maximum Counts Observed*: 20cpm
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
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) 2c
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 41502182 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:
12	COC form is properly signed in relinquished/received sections?	✓			
13	Carrier and tracking number.	✓			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 9859 3933 6100

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials CM Date 3/10/11 Page 1 of 1

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab Batch No. N/A

SMO Use

AR/COC 613448

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	3/8/11	Project/Task No.98026.01.15	☐ Waste Characterization
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	124439	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:_____
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 273600

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090237-001	CTF-MW2	132	NA	03/08/11 1007	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090237-002	CTF-MW2	132	NA	03/08/11 1009	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	002
090237-009	CTF-MW2	132	NA	03/08/11 1010	GW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	003
090237-010	CTF-MW2	132	NA	03/08/11 1011	FGW	P	500 ml	HNO3	G	SA	TAL Metals+ Ur (SW846-6020/7470)	004
090237-016	CTF-MW2	132	NA	03/08/11 1012	GW	P	250ml	4C	G	SA	Anions (SW846-9056)	005
090237-018	CTF-MW2	132	NA	03/08/11 1013	GW	P	250ml	H2SO4	G	SA	NPN (353.2)	006
090237-020	CTF-MW2	132	NA	03/08/11 1014	GW	P	500ml	4C	G	SA	Perchlorate (314.0)	007
090237-022	CTF-MW2	132	NA	03/08/11 1015	GW	P	500ml	4C	G	SA	Alkalinity (SM2320B)	008
090237-024	CTF-MW2	132	NA	03/08/11 1017	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	009
090237-033	CTF-MW2	132	NA	03/08/11 1018	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090237-034	CTF-MW2	132	NA	03/08/11 1019	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:
QC inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If Perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
Water has high buffering capacity,chech pH and add pres.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	Weston/4142/844-5130/228-0710
	William Gibson	William Gibson	WG	Weston/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 3/8/11	Time 1130	4.Relinquished by	Org.	Date	Time
1. Received by	[illegible]	Org. 4133	Date 3/8/11	Time 1130	4. Received by	Org.	Date	Time
2.Relinquished by	[illegible]	Org. 4133	Date 3/8/11	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by	[illegible]	Org. GEL	Date 3-9-11	Time 0830	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

up

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613448

Project Name:	SWMU 154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090237-035	CTF-MW2	132	NA	03/08/11 1020	GW	P	1 Liter	HNO3	G	SA	Isotopic Ur (ASTM D3972-09M)	012
090238-001	CTF-MW2	132	NA	03/08/11 1007	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	013
090238-002	CTF-MW2	132	NA	03/08/11 1009	GW	AG	4x1L	4C	G	DU	TCL SVOC (SW846-8270C)	014
090238-009	CTF-MW2	132	NA	03/08/11 1010	GW	P	500 ml	HNO3	G	DU	TAL Metals+ Ur (SW846-6020/7470)	015
090238-010	CTF-MW2	132	NA	03/08/11 1011	FGW	P	500 ml	HNO3	G	DU	TAL Metals+ Ur (SW846-6020/7470)	016
090238-016	CTF-MW2	132	NA	03/08/11 1012	GW	P	250ml	4C	G	DU	Anions (SW846-9056)	017
090238-018	CTF-MW2	132	NA	03/08/11 1013	GW	P	250ml	H2SO4	G	DU	NPN (353.2)	018
090238-020	CTF-MW2	132	NA	03/08/11 1014	GW	P	500ml	4C	G	DU	Perchlorate (314.0)	019
090238-022	CTF-MW2	132	NA	03/08/11 1015	GW	P	500ml	4C	G	DU	Alkalinity (SM2320B)	020
090238-024	CTF-MW2	132	NA	03/08/11 1017	GW	AG	4x1L	4C	G	DU	High Explosive (SW846-8321A) Mod.	021
090238-033	CTF-MW2	132	NA	03/08/11 1018	GW	P	1 Liter	HNO3	G	DU	Gamma Spec (short list)(901.0)	022
090238-034	CTF-MW2	132	NA	03/08/11 1019	GW	P	1 Liter	HNO3	G	DU	Gross Alpha/Beta (900.0)	023
090238-035	CTF-MW2	132	NA	03/08/11 1020	GW	P	1 Liter	HNO3	G	DU	Isotopic Ur (ASTM D3972-09M)	024
090239-001	CTF-TB5	NA	NA	03/08/11 1007	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	025
090240-001	CTF-FB2	NA	NA	03/08/11 0950	DIW	G	3x40ml	HCL	G	FB	VOC (SW846-8260B)	026

Abnormal Conditions on Receipt

LAB USE

Recipient Initials ME

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

Page 1 of 2

AR/COC 613447

SMO Use

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	3/8/11	Project/Task No.98026.01.15	☐ Waste Characterization
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	2439	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185	500 BOTTLES ON DOCK	☑ Validation Required
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090235-001	CTF-EB2	NA	NA	030711\1100	DIW	G	3x40ml	HCL	G	EB	TCL VOC (SW846-8260B)	027
090235-002	CTF-EB2	NA	NA	030711\1102	DIW	AG	4x1L	4C	G	EB	TCL SVOC (SW846-8270C)	028
090235-009	CTF-EB2	NA	NA	030711\1104	DIW	P	500 ml	HNO3	G	EB	TAL Metals+ Ur (SW846-6020/7470)	029
090235-010	CTF-EB2	NA	NA	030711\1105	FDIW	P	500 ml	HNO3	G	EB	TAL Metals+ Ur (SW846-6020/7470)	030
090235-016	CTF-EB2	NA	NA	030711\1106	DIW	P	250ml	4C	G	EB	Anions (SW846-9056)	031
090235-018	CTF-EB2	NA	NA	030711\1107	DIW	P	250ml	H2SO4	G	EB	NPN (353.2)	032
090235-020	CTF-EB2	NA	NA	030711\1108	DIW	P	500ml	4C	G	EB	Perchlorate (314.0)	033
090235-022	CTF-EB2	NA	NA	030711\1109	DIW	P	500ml	4C	G	EB	Alkalinity (SM2320B)	034
090235-024	CTF-EB2	NA	NA	030711\1110	DIW	AG	4x1L	4C	G	EB	High Explosive (SW846-8321A) Mod.	035
090235-033	CTF-EB2	NA	NA	030711\1112	DIW	P	1 Liter	HNO3	G	EB	Gamma Spec (short list)(901.0)	036
090235-034	CTF-EB2	NA	NA	030711\1113	DIW	P	1 Liter	HNO3	G	EB	Gross Alpha/Beta (900.0)	037

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:
QC inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG.4142/MS.0729/ 284-2547
If Perchlorate detected perform verification analysis(SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367
	Don Schofield		DS	Sandia/4142/844-4088

1.Relinquished by		Org. 4142	Date 3/7/11	Time 1335	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4133	Date 3/7/11	Time 1335	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4133	Date 3/8/11	Time 0700	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 3/9/11	Time 0830	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613447

Project Name:	SWMU 154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use: Lab Sample ID
090235-035	CTF-EB2	NA	NA	030711\1114	DIW	P	1 Liter	HNO3	G	EB	Isotopic Ur (ASTM D3972-09M)	038
090236-001	CTF-TB4	NA	NA	030711\1100	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	039

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MK

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: SANDIA	**SDG/AR/COC/Work Order:** 613447, 613448
Received By: ME	**Date Received:** 3-9-11

Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		✓	Maximum Counts Observed*: opm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
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) 2c 3c
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 4502182 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: See Attached sheet 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:
12	COC form is properly signed in relinquished/received sections?	✓			
13	Carrier and tracking number.	✓			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 9859 3933 5814 3c; 5869 3c; 5358 3c; 5870 2c; 5825 2c

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials ER Date 3/9/11 Page 1 of 2

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

Client: SANDIA Received By: MK Date Received: 3-9-11 SDG/AR/COC/Work Order: 273600

SAMPLES THAT NEED TO BE PRESERVED	PRESERVATIVE
090237-009	HNO3
-010	HNO3
-033	HNO3
090238-033	HNO3
-034	HNO3
-035	HNO3

HNO3 LOT # J39301

PM (or PMA) review: Initials EPL Date 3/9/11 Page 2 of 2

Subject: Re: SDG 273600, ARCOC-613447, 613448, SWMU 154 Condition on Receipt
From: Edie Kent <emk@gel.com>
Date: Wed, 09 Mar 2011 14:16:19 -0500
To: Pam Puissant <pmpuiss@sandia.gov>, "Palencia, Wendy J" <wjpalen@sandia.gov>, "Herrera, Lorraine R" <lrherre@sandia.gov>, "Kavanaugh, Rita" <rkavana@sandia.gov>, "team.kent" <team.kent@gel.com>

Lorraine:
There was not a note about this on the bottle order. However, there was a note on the chain of custody as well as the e-mail that Tim Jackson sent ahead of time indicating that this would be needed.

Edie

Herrera, Lorraine R wrote:

> Edie,
> Was the added preservation recorded (indicated on bottle order)?
>
> -----Original Message-----
> From: Edie Kent [mailto:emk@gel.com]
> Sent: Wednesday, March 09, 2011 11:40 AM
> To: Puissant, Pamela M; Palencia, Wendy J; Herrera, Lorraine R; Kavanaugh, Rita; team.kent
> Subject: SDG 273600, ARCOC-613447, 613448, SWMU 154 Condition on Receipt
>
> The following samples were received out of pH specifications and have
> been preserved with HNO3 as directed on the chain of custody:
>
> 090237-009
> 090237-010
> 090237-033
> 090238-033
> 090238-034
> 090238-035
>
> Edie
>
> --
> Edith M. Kent
> Project Manager
> GEL Laboratories, LLC
> 2040 Savage Road
> Charleston, SC (USA) 29407
> Direct: 843.769.7385 x4453
> Main: 843.556.8171
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> Web: www.gel.com
>
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Attachment 3
Data Validation Reports for
Groundwater Analytical Results
January 2011 – March 2011

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: April 12, 2011

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: SWMU 149 GWM
AR/COC: 613449 and 613450
SDG: 273689
Laboratory: GEL
Project/Task: 98026.01.14
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. The calibration verification percent difference for acetone was >40% but ≤60% with negative bias. The associated sample results were non-detects and will be **qualified "UJ,C3."**

2. In the equipment blank (EB), sample 273689-017, associated with samples -001, -008, and -016, bromodichloromethane; chloroform; and dibromochloromethane were detected at concentrations > the practical quantitation limit (PQL). The bromodichloromethane; chloroform; and dibromochloromethane results for sample -001 and the chloroform and dibromochloromethane results for sample -008 were detects <5X the EB concentrations and ≤ the PQL and will be **qualified "1.0U,B2"** at the value of the PQL (ug/L). The bromodichloromethane; chloroform; and dibromochloromethane results for sample -016 were detects <5X the EB concentrations but > the PQL and will be **qualified respectively "2.0U,B2," "4.5U,B2,"** and **"2.2U,B2"** at their reported values (ug/L). All other associated sample results were non-detects and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the summary section and as follows.

The calibration verification percent difference for cis-1,2-dichloroethylene was >20% with a positive bias. The associated sample results were non-detects and will not be qualified for the calibration infraction.

The calibration verification percent difference for 2-hexanone was >20% but ≤40% with negative bias. All associated sample results were non-detects, and no other calibration infractions occurred for these analytes. Therefore, all associated sample results will not be qualified.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

In the field blank (FB), sample -016, associated with samples -001 and -008, bromodichloromethane; chloroform; and dibromochloromethane were detected at concentrations > the PQL. However, it should be noted that the bromodichloromethane; chloroform; and dibromochloromethane results for the FB have already been qualified non-detect due to EB contamination and, thus, do not affect the associated field sample results.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria. It should be noted that the MS/MSD analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Trip blanks, EB, FB, and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

616 Maxine NE
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www.aqainc.net

Memorandum

Date: April 12, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 149 GWM
AR/COC: 613449 and 613450
SDG: 273689
Laboratory: GEL
Project/Task: 98026.01.14
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. Problems were identified with the data package that results in the qualification of data.

1. Alkalinity:
   Bicarbonate alkalinity was detected in the method blanks (MBs) at concentrations ≥ the practical quantitation limit (PQL). The bicarbonate alkalinity result for sample 273689-023 was a detect <5X the MB result and will be **qualified "5.3UJ,B"** at 5X the MB value (mg/L). The other associated sample results were detects ≥5X the MB result and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

Anions by Ion Chromatography:
Chloride was detected in the equipment blank (EB), sample -020, associated with samples -004 and -011, at a concentration ≥ the PQL. The associated sample results were detects ≥5X the EB result and will not be qualified.

Alkalinity:
Bicarbonate alkalinity was detected in the EB, sample -023, associated with samples -007 and -014, at a concentration ≥ the PQL. However, it should be noted that the bicarbonate alkalinity result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the associated field sample results.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Perchlorate:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Alkalinity:
It should be noted that for sample -023 the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Perchlorate:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Alkalinity:
It should be noted that for sample -023 the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Samples -005 and -012 were diluted 10X due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Anions by Ion Chromatography:
Samples -004 and -011 were diluted 20X for chloride and sulfate due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

ANALYTICAL QUALITY ASSOCIATES, INC.
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Memorandum

Date: April 12, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 149 GWM
AR/COC: 613449 and 613450
SDG: 273689
Laboratory: GEL
Project/Task: 98026.01.14
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Six soil samples were prepared and analyzed with approved procedures using methods EPA 6020 (ICP-MS metals), and EPA 7470A (CVAA mercury). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   Cr, Fe, Ni were detected in the method blank (MB) at concentrations ≥ the method detection limit (MDL) but < the practical quantitation limit (PQL). The Cr results for all samples except 273689-009 were detects <5X the MB result and will be **qualified "0.022U,B"** at 5X the MB value (mg/L). The Fe result for sample -019 was a detect <5X the MB result and will be **qualified "0.45U,B"** at 5X the MB value (mg/L). The Ni result for sample -018 was a detect <5X the MB result and will be **qualified "0.0027U,B"** at 5X the MB value (mg/L). All other associated sample results were either non-detects or detects >5X the MB result and will not be qualified.

   Mn and Cu were detected in the equipment blank (EB), sample -018, associated with samples -002 and -009, at concentrations ≥ the MDL but < the PQL. The Mn result for sample -002 was a detect <5X the EB result and will be **qualified "0.0063U,B2"** at 5X the EB value (mg/L). The Cu results were detects <5X the EB result and will be **qualified "0.0020U,B2"** at 5X the EB value (mg/L). The other associated sample result was a non-detect and will not be qualified.

2. CVAA mercury:
   Hg was detected in the continuing calibration blank (CCB) at a negative concentration with an absolute value ≥ the MDL but < the practical quantitation limit PQL. The associated sample results were non-detects and will be **qualified "UJ,B4."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria..

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

ICP-MS metals:
In the EB, sample -018, associated with samples -002 and -009, Cr, Ni, Na, and Sb were detected at a concentrations ≥ the MDL but < the PQL. However, it should be noted that the Cr and Ni results for the EB have already been qualified non-detect due to MB contamination and, thus, do not affect the associated field sample results. All other associated sample results were either non-detects or detects >5X the EB result and will not be qualified.

In the EB, sample -019, associated with samples -003 and -010, Cr, Fe, Na, and Sb were detected at a concentrations ≥ the MDL but < the PQL. However, it should be noted that the Cr and Fe results for the EB have already been qualified non-detect due to MB contamination and, thus, do not affect the associated field sample results. All other associated sample results were either non-detects or detects >5X the EB result and will not be qualified.

ICP-MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria except as follows.

ICP-MS metals:
It should be noted that the MS had K and Na concentrations >4X the analyte spike concentrations and the MS recoveries for K and Na did not meet QC acceptance criteria. However, according to AOP criteria, K and Na are not required MS analytes. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

ICP-MS metals:
Samples -002, -003, -009, and -010 were diluted 5X for Ca and Na due to over-range concentrations.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS A and AB)

All ICS A and AB met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
The Ca concentration for samples -002, -003, -009, and -010 were > the ICS A Ca concentration and the ICS A result for Cr and Mn were > the MDL. However, the associated sample results were either non-detects or qualified non-detects due to blank contamination and will not be qualified.

ICP Serial Dilution

The serial dilution analyses met all QC acceptance criteria.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

Sample Findings Summary

AR/COC: 613449, 613450

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SM 2320B			
	090241-022/CTF-EB3	Bicarbonate alkalinity (CaCO3) (7	5.3UJ, B
SW846 3005/6020 DOE-AL			
	090241-009/CTF-EB3	Chromium (7440-47-3)	0.022U, B
	090241-009/CTF-EB3	Nickel (7440-02-0)	0.0027U, B
	090241-010/CTF-EB3	Chromium (7440-47-3)	0.022U, B
	090241-010/CTF-EB3	Iron (7439-89-6)	0.45U, B
	090243-009/CTF-MW3	Chromium (7440-47-3)	0.022U, B
	090243-009/CTF-MW3	Copper (7440-50-8)	0.0020U, B2
	090243-009/CTF-MW3	Manganese (7439-96-5)	0.0063U, B2
	090243-010/CTF-MW3	Chromium (7440-47-3)	0.022U, B
	090244-009/CTF-MW3	Copper (7440-50-8)	0.0020U, B2
	090244-010/CTF-MW3	Chromium (7440-47-3)	0.022U, B
SW846 7470A			
	090241-009/CTF-EB3	Mercury (7439-97-6)	UJ, B4
	090241-010/CTF-EB3	Mercury (7439-97-6)	UJ, B4
	090243-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090243-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090244-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090244-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
SW846 8260B DOE-AL			
	090241-001/CTF-EB3	Acetone (67-64-1)	UJ, C3
	090242-001/CTF-TB6	Acetone (67-64-1)	UJ, C3
	090243-001/CTF-MW3	Acetone (67-64-1)	UJ, C3
	090243-001/CTF-MW3	Bromodichloromethane (75-27-4	1.0U, B2
	090243-001/CTF-MW3	Chloroform (67-66-3)	1.0U, B2
	090243-001/CTF-MW3	Dibromochloromethane (124-48	1.0U, B2
	090244-001/CTF-MW3	Acetone (67-64-1)	UJ, C3
	090244-001/CTF-MW3	Chloroform (67-66-3)	1.0U, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090244-001/CTF-MW3	Dibromochloromethane (124-48	1.0U, B2
	090245-001/CTF-TB7	Acetone (67-64-1)	UJ, C3
	090246-001/CTF-FB3	Acetone (67-64-1)	UJ, C3
	090246-001/CTF-FB3	Bromodichloromethane (75-27-4	2.0U, B2
	090246-001/CTF-FB3	Chloroform (67-66-3)	4.5U, B2
	090246-001/CTF-FB3	Dibromochloromethane (124-48	2.2U, B2

All other analyses met QC acceptance criteria; no further data should be qualified.

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www.aqainc.net

Memorandum

Date: April 14, 2011

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. In the equipment blank (EB), sample 273600-027, associated with samples -001, -013, and -026, bromodichloromethane; chloroform; and dibromochloromethane were detected at concentrations > the practical quantitation limit (PQL). The bromodichloromethane; chloroform; and dibromochloromethane results for sample -026 were detects <5X the EB concentrations but > the PQL and will be **qualified respectively "2.9U,B2," "5.5U,B2,"** and **"2.4U,B2"** at their reported values (ug/L). All other associated sample results were non-detects and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

In the field blank (FB), sample -026, associated with samples -001 and -013, bromodichloromethane; chloroform; and dibromochloromethane were detected at concentrations > the PQL. However, it should be noted that the bromodichloromethane; chloroform; and dibromochloromethane results for the FB have already been qualified non-detect due to EB contamination and, thus, do not affect the associated field sample results.

In the trip blank (TB), sample -039, associated with sample -027, toluene was detected at a concentration > the method detection limit (MDL) but < the PQL. The associated sample result was a non-detect and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

TBs, EB, FB, and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

616 Maxine NE
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www.aqainc.net

Memorandum

Date: April 21, 2011

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: SVOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8270C (SVOCs). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. The initial calibration intercept for di-n-octylphthalate was negative with absolute value >3X the method detection limit (MDL). The associated sample results were non-detects and will be **qualified "R, I5."**

Data are acceptable, except as noted above, and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were extracted and analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the summary section and as follows.

The initial calibration intercept for naphthalene was positive and >3X the MDL. The associated sample results were non-detects and will not be qualified.

The coefficient of determination (r^2) of the initial calibration curves for dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were <0.99 but ≥0.90. All associated sample results were non-detects, and no other calibration infractions occurred for these analytes. Therefore, the associated sample results will not be qualified.

The calibration verification percent difference for benzo(ghi)perylene was >20% with a positive bias. The associated sample results were non-detects and will not be qualified for the calibration infraction.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

An equipment blank and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

616 Maxine NE
Albuquerque, NM 87123
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www.aqainc.net

Memorandum

Date: April 14, 2011

To: File

From: Kevin Lambert

Subject: LC/MS/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: High Explosives (HE)

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8321A Mod. (HE by LCMSMS). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. The initial calibration response factor for p-nitrotoluene was <0.05 but ≥0.01. The associated sample results were non-detects and will be **qualified "UJ,I4."**

2. The calibration verification percent differences for RDX were >20% with a positive bias. The RDX result for sample 273600-009 and -021 were detects and will be **qualified "J+,C2."** The other associated sample result was a non-detect and will not be qualified for the calibration infraction.

3. For sample -009, the surrogate percent recovery of 3,4-dinitrotoluene was > the upper acceptance limit. The RDX result was a detect and will be **qualified "J+, S1."** All other associated sample results were non-detects and will not be qualified.

   It should be noted that all appropriate reason code(s) will be included with the associated sample results.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were extracted and analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the summary section and as follows.

The calibration verification percent difference for PETN was >20% but ≤40% with negative bias. All associated sample results were non-detects, and no other calibration infractions occurred for these analytes. Therefore, all associated sample results will not be qualified.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria except as follows.

The CRI percent recoveries of tetryl; o-nitrotoluene; nitrobenzene; and PETN were > the upper acceptance limit. All associated sample results were non-detects and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria except as noted above in the summary section.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria except as follows.

The MSD percent recovery of m-dinitrobenzene was > the upper acceptance limit. The associated sample results were non-detects and will not be qualified. Also, it should be noted that the MS/MSD analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. According to laboratory procedure, all sample and QC extracts were diluted 2X with HPLC grade water.

Other QC

An equipment blank and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

616 Maxine NE
Albuquerque, NM 87123
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www.aqainc.net

Memorandum

Date: April 15, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as follows.

Anions by Ion Chromatography:
Chloride was detected in the equipment blank (EB), sample 273600-031, associated with samples -005 and -017, at a concentration ≥ the practical quantitation limit (PQL). The associated sample results were detects ≥5X the EB result and will not be qualified.

Alkalinity:
Bicarbonate alkalinity was detected in the EB, sample -034, associated with samples -008 and -020, at a concentration ≥ the PQL. The associated sample results were detects ≥5X the MB result and will not be qualified.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Nitrate/Nitrite and Alkalinity:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Nitrate/Nitrite and Alkalinity:

It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Anions by Ion Chromatography:
Samples -005 and -017 were diluted 4X for bromide and fluoride and were diluted 25X for chloride and sulfate due to high concentration and matrix interference.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

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Memorandum

Date: April 14, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Six samples were prepared and analyzed with approved procedures using methods EPA 6020 (ICP-MS metals), and EPA 7470A (CVAA mercury). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   Ca was detected in the method blank (MB) at a concentration ≥ the method detection limit (MDL) but < the practical quantitation limit (PQL). The Ca results for samples 273600-029 and -030 were detects <5X the MB result and will be **qualified "0.44U,B"** at 5X the MB value (mg/L). The other associated sample results were detects >5X the MB result and will not be qualified.

   As and Cu were detected in the equipment blank (EB), sample -029, associated with samples -003 and -015, at concentrations ≥ the MDL but < the PQL. The As result for sample -015 was a detect <5X the EB result and will be **qualified "0.058U,B2"** at 5X the EB value (mg/L – normalized to the sample result). The Cu result for sample -003 was detect <5X the EB result and will be **qualified "0.017U,B2"** at 5X the EB value (mg/L – normalized to the sample result). All other associated sample results were either non-detects or detects >5X the EB result and will not be qualified.

   Al was detected in the EB, sample -030, associated with samples -004 and -016, at a concentration ≥ the PQL. The associated sample results were either a non-detect or a detect <5X the EB result and will be **qualified "1.5UJ,B2"** at 5X the EB value (mg/L – normalized to the sample results).

The MS had a Mn concentration >4X the analyte spike concentration and the MS recovery did not meet QC acceptance criteria. The Mn results for samples -029 and -030 were non-detects and will be **qualified "UJ,MS1"** due to lack of matrix-specific accuracy data. All other associated sample results were detects and will be **qualified "J,MS1"** due to lack of matrix-specific accuracy data.

The serial dilution percent difference for Mn was >10%. The Mn result for samples -029 and -030 were non-detects and will be **qualified "UJ,D1"** due to poor serial dilution precision. All other associated sample results were detects and will be **qualified "J,D1"** due to poor serial dilution precision.

It should be noted that all appropriate reason code(s) will be included with the associated sample results.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

ICP-MS metals:
In the EB, sample -029, associated with samples -003 and -015, Ca, Na, Zn, and Cr were detected at concentrations ≥ the MDL but < the PQL. However, it should be noted that the Ca result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the associated field sample results. All other associated sample results were either non-detects or detects >5X the EB result and will not be qualified.

In the EB, sample -030, associated with samples -004 and -016, Ca, Na, Cr, and Cu were detected at concentrations ≥ the MDL but < the PQL. However, it should be noted that the Ca result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the associated field sample results. All other associated sample results were either non-detects or detects >5X the EB result and will not be qualified.

ICP-MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
It should be noted that the MS had Ca, Mg, K and Na concentrations >4X the analyte spike concentrations and the MS recoveries for Ca, Mg, and K did not meet QC acceptance criteria. However, according to AOP criteria, Ca, Mg, and K are not required MS analytes. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

ICP-MS metals:
Samples -003, -004, -015, and -016 were diluted 5X due to high native sample concentration of an internal standard and were diluted 50X for Ca and Na due to over-range concentrations.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the concentrations of Al, Ca, Fe, and Mg in the samples were < those in the ICS solutions. No sample data will be qualified as a result.

ICP Serial Dilution

The serial dilution analyses met all QC acceptance criteria except as noted above in the summary section.

Other QC

EBs and a field duplicate pair were submitted on the AR/COC(s). There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

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Memorandum

Date: April 15, 2011

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613447 and 613448
SDG: 273600
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with approved procedures using method EPA 901.1 (gamma spec – short list), EPA 900.0 (gross alpha/beta), and HASL 300, U-02-RC Mod (Alpha Spec U). Problems were identified with the data package that result in the qualification of data.

1. Gamma Spec:
   All associated gamma spec results that were either < the associated 2-sigma total propagated uncertainty (TPU) or < the associated minimum detectable activity (MDA) will be **qualified "BD,FR3."**

   For samples 273600-010 and -022, the K-40 result was <3X the associated MDA and will be **qualified "J,FR7."**

2. Gross Alpha/Beta:
   For sample -037, gross alpha and beta results were either < the associated 2-sigma TPU or < the associated MDA and will be **qualified "BD,FR3."**

3. Alpha Spec U:
   For sample -038, the U-233/234, U-235/236, and U-238 results were either < the associated 2-sigma TPU or < the associated MDA and will be **qualified "BD,FR3."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Quantification

All quantification criteria were met except as noted above in the summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

All tracer/carrier recoveries met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gamma Spec:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Gross Alpha/Beta:
Since a replicate and MSD were performed for gross alpha/beta analysis, two measures of precision were available. The MS/MSD pair was used to evaluate gross alpha/beta precision.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All required detection limits were met. No dilutions were required.

Other QC

Equipment blanks and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613447, 613448

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
DOE EML HASL-300, U-02-RC			
	090235-035/CTF-EB2	Uranium-233/234 ()	BD, FR3
	090235-035/CTF-EB2	Uranium-235/236 (13982-70-2)	BD, FR3
	090235-035/CTF-EB2	Uranium-238 (7440-61-1)	BD, FR3
EPA 900.0/SW846 9310			
	090235-034/CTF-EB2	ALPHA (12587-46-1)	BD, FR3
	090235-034/CTF-EB2	BETA (12587-47-2)	BD, FR3
EPA 901.1			
	090235-033/CTF-EB2	Americium-241 (14596-10-2)	BD, FR3
	090235-033/CTF-EB2	Cesium-137 (10045-97-3)	BD, FR3
	090235-033/CTF-EB2	Cobalt-60 (10198-40-0)	BD, FR3
	090235-033/CTF-EB2	Potassium-40 (13966-00-2)	BD, FR3
	090237-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090237-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090237-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090237-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
	090238-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090238-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090238-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090238-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
SW846 3005/6020 DOE-AL			
	090235-009/CTF-EB2	Calcium (7440-70-2)	0.44U, B
	090235-009/CTF-EB2	Manganese (7439-96-5)	UJ, MS1,D1
	090235-010/CTF-EB2	Calcium (7440-70-2)	0.44U, B
	090235-010/CTF-EB2	Manganese (7439-96-5)	UJ, MS1,D1
	090237-009/CTF-MW2	Copper (7440-50-8)	0.017U, B2
	090237-009/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
	090237-010/CTF-MW2	Aluminum (7429-90-5)	1.5UJ, B2
	090237-010/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090238-009/CTF-MW2	Arsenic (7440-38-2)	0.058U, B2
	090238-009/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
	090238-010/CTF-MW2	Aluminum (7429-90-5)	1.5UJ, B2
	090238-010/CTF-MW2	Manganese (7439-96-5)	J, MS1,D1
SW846 3535/8321A Modifie			
	090235-024/CTF-EB2	p-Nitrotoluene (99-99-0)	UJ, I4
	090237-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
	090237-024/CTF-MW2	RDX (121-82-4)	J+, C2,S1
	090238-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
	090238-024/CTF-MW2	RDX (121-82-4)	J+, C2
SW846 8260B DOE-AL			
	090240-001/CTF-FB2	Bromodichloromethane (75-27-4	2.9U, B2
	090240-001/CTF-FB2	Chloroform (67-66-3)	5.5U, B2
	090240-001/CTF-FB2	Dibromochloromethane (124-48	2.4U, B2
SW846 8270C			
	090235-002/CTF-EB2	Di-n-octylphthalate (117-84-0)	R, I5
	090237-002/CTF-MW2	Di-n-octylphthalate (117-84-0)	R, I5
	090238-002/CTF-MW2	Di-n-octylphthalate (117-84-0)	R, I5

All other analyses met QC acceptance criteria; no further data should be qualified.