

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050302 & L13050303

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 10, 2013

Matrix: Groundwater; two samples and one field duplicate

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery Group: L13050302
L13050303 (CFA WO 4804)

Sample Nos.: HTA19-0513-1, HTA19-0513-2, and HTA12-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010*; *Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050302 & L13050303
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	7	NA	✓	✓	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	✓	✓	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	✓	NA	✓
Metals 6010B	✓	✓	✓	✓	NA	✓	✓	NA	✓
Metals 6020	✓	✓	✓	✓	NA	✓	✓	NA	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	✓	NA	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	✓	✓	✓
pH 9040C	✓	✓	✓	NA	NA	✓	✓	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	✓	NA	NA
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	✓	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	✓	✓	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	✓	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VIII. Other

A. The sample was analyzed at 5,000-times and 5-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid and Butyl Benzyl Phthalate failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. If an analyte concentration detected in a project sample was less than 5 times the associated blank concentration, then the sample result was reported as not detected (U) at the specified limit of quantitation (LOQ) or the reported concentration. Bis(2-Ethylhexyl)phthalate was detected in the method blank and was detected less than 5 times the associated MB in field sample ID HTA12-0513-1. Field sample HTA12-0513-1 was re-extracted out of hold with a new method blank (file WG430163). Bis(2-Ethylhexyl)phthalate was not detected in the re-extracted and MB. Bis(2-Ethylhexyl)phthalate result is qualified with the flag “U” indicating not detected for the original within hold extraction. Reason code is MB indicating method blank contamination. Original analytical result of HTA12-0513-1 within hold time and the Re-extract outside of EPA recommended hold time will be reported. CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG due to insufficient volume of sample.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for bis(2-Ethylhexyl)phthalate and Benzoic Acid. Because the analyte was not detected in any samples in the batch, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. One field duplicate sample was submitted in this SDG. Precision measures were not calculated as all results were non-detect for the analytes of interest.

VIII. Other

A. Sample HTA12-0513-1 was re-extracted out of hold because of MB contamination for Bis(2-Ethylhexyl)phthalate . Re-extract sample and the new MB was analyze with non-detected results. The original analytical data within the holding time was reported because Bis(2-Ethylhexyl)phthalate concentration detected in a project sample was less than 5 times the associated blank detected concentration.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Nitroglycerin. Because the analyte was not detected in any samples in the batch, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. One field duplicate sample was submitted in this SDG. Precision measures were not calculated as all results were non-detect for the analytes of interest.

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 1.6°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted in this SDG. Precision measures were not calculated as all results were non-detect for the analytes of interest.

VIII. Other

A. LOQ was reviewed and found compliant.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were analyzed on a sample not associated with this site (not WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found compliant. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent..

VIII. Other

A. LOQ were reviewed and found compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VIII. Other

A. LOQ were reviewed and found compliant. Chloride and sulfate concentrations were determined from 5-times dilution analyses.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. Hydrogen ion activities (pH) were measured in the field at the time of sample collection and again at the laboratory.

III. Calibration

A. pH meter calibration at the laboratory was documented using buffer solutions pH 4, 7, and 10.

IV. LCS

A. The LCS sample pH was measured at the laboratory and the results were acceptable.

V. Duplicate

A. A laboratory duplicate sample analysis was evidenced on the sample run bench sheet. Precision was acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance.

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VII. Other

A. LOQ was reviewed and found compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG). Acceptable precision control criteria are established at less than 35 percent for water. Field duplicate precision was calculated when both results of the pair was greater than the LOQ. Precision was acceptable with RPD less than thirty five percent.

VII. Other

A. LOQ was reviewed and found compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 16 and 4-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050302 & L13050303

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples and one field duplicate: HTA19-0513-1, HTA19-0513-2, and HTA12-0513-1.

Semivolatiles Organic – Data Qualification Summary

2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure. All other compound results were reviewed and did not require qualification. Confirmatory analyses were performed on all samples showing detectable results.

The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. If an analyte concentration detected in a project sample was less than 5 times the associated blank concentration, then the sample result was reported as not detected (U) at the specified limit of quantitation (LOQ) or the reported concentration. Bis(2-Ethylhexyl)phthalate was detected in the method blank and was detected less than 5 times the associated MB in field sample ID HTA12-0513-1. Field sample HTA12-0513-1 was re-extracted out of hold with a new method blank (file WG430163). Bis(2-Ethylhexyl)phthalate was not detected in the re-extracted and MB. Bis(2-Ethylhexyl)phthalate result is qualified with the flag “U” indicating not detected for the original within hold extraction. Reason code is MB indicating method blank contamination. Original analytical result of HTA12-0513-1 within hold time and the Re-extract outside of EPA recommended hold time will be reported. CCB analysis results were reviewed and found to be in compliance.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

Method	Parameter	Parent Sample HTA19-0513-1	Qual	Duplicate Sample HTA19-0513-2	Qual	Units	RPD
6850	Perchlorate	9550		9350		ug/l	2.0%
8330B	1,3,5-Trinitrobenzene	1.09	U	1.11	U	ug/l	NC
8330B	1,3-Dinitrobenzene	1.09	U	1.11	U	ug/l	NC
8330B	2,4,6-Trinitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	2,4-Dinitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	2,6-Dinitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	2-Amino-4,6-dinitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	2-Nitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	3-Nitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	4-Nitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	4-Amino-2,6-dinitrotoluene	1.09	U	1.11	U	ug/l	NC
8330B	HMX	1.09	U	1.11	U	ug/l	NC
8330B	Nitrobenzene	1.09	U	1.11	U	ug/l	NC
8330B	RDX	1.09	U	1.11	U	ug/l	NC
8330B	Tetryl	1.09	U	1.11	U	ug/l	NC
8330B	Nitroglycerin	1.09	U	1.11	U	ug/l	NC
8330B	PETN	1.09	U	1.11	U	ug/l	NC
8270C	1,2,4-Trichlorobenzene	10.3	U	10.3	U	ug/l	NC
8270C	1,2-Dichlorobenzene	10.3	U	10.3	U	ug/l	NC
8270C	1,3-Dichlorobenzene	10.3	U	10.3	U	ug/l	NC
8270C	1,4-Dichlorobenzene	10.3	U	10.3	U	ug/l	NC
8270C	2,4,5-Trichlorophenol	10.3	U	10.3	U	ug/l	NC

8270C	2,4,6-Trichlorophenol	10.3	U	10.3	U	ug/l	NC
8270C	2,4-Dichlorophenol	10.3	U	10.3	U	ug/l	NC
8270C	2,4-Dinitrophenol	41.2	U	41.2	U	ug/l	NC
8270C	2,4-Dinitrotoluene	10.3	U	10.3	U	ug/l	NC
8270C	2,6-Dinitrotoluene	10.3	U	10.3	U	ug/l	NC
8270C	2-Chloronaphthalene	10.3	U	10.3	U	ug/l	NC
8270C	2-Chlorophenol	10.3	U	10.3	U	ug/l	NC
8270C	2-Methylnaphthalene	10.3	U	10.3	U	ug/l	NC
8270C	2-methylphenol	10.3	U	10.3	U	ug/l	NC
8270C	2-Nitroaniline	41.2	U	41.2	U	ug/l	NC
8270C	2-Nitrophenol	10.3	U	10.3	U	ug/l	NC
8270C	3,3'-Dichlorobenzidine	10.3	U	10.3	U	ug/l	NC
8270C	3-,4-Methylphenol	10.3	U	10.3	U	ug/l	NC
8270C	3-Nitroaniline	41.2	U	41.2	U	ug/l	NC
8270C	4,6-Dinitro-2-methylphenol	41.2	U	41.2	U	ug/l	NC
8270C	4-Bromophenyl-phenylther	10.3	U	10.3	U	ug/l	NC
8270C	4-Chloro-3-methylphenol	10.3	U	10.3	U	ug/l	NC
8270C	4-Chloroaniline	10.3	U	10.3	U	ug/l	NC
8270C	4-Chlorophenyl-phenyl ether	10.3	U	10.3	U	ug/l	NC
8270C	4-Nitroaniline	41.2	U	41.2	U	ug/l	NC
8270C	4-Nitrophenol	41.2	U	41.2	U	ug/l	NC
8270C	Acenaphthene	10.3	U	10.3	U	ug/l	NC
8270C	Acenaphthylene	10.3	U	10.3	U	ug/l	NC
8270C	Anthracene	10.3	U	10.3	U	ug/l	NC
8270C	Benzo(a)anthracene	10.3	U	10.3	U	ug/l	NC
8270C	Benzo(a)pyrene	10.3	U	10.3	U	ug/l	NC
8270C	Benzo(b)fluoranthene	10.3	U	10.3	U	ug/l	NC
8270C	Benzo(g,h,i)perylene	10.3	U	10.3	U	ug/l	NC
8270C	Benzo(k)fluoranthene	10.3	U	10.3	U	ug/l	NC
8270C	Benzoic acid	41.2	U	41.2	U	ug/l	NC
8270C	Benzyl alcohol	10.3	U	10.3	U	ug/l	NC
8270C	Bis(2-Chloroethoxy)Methane	10.3	U	10.3	U	ug/l	NC
8270C	Bis(2-Chloroethyl)ether	10.3	U	10.3	U	ug/l	NC
8270C	Bis(20Chloroisopropyl)ether	10.3	U	10.3	U	ug/l	NC
8270C	Bis(2-Ethylhexyl)phthalate	10.3	U	10.3	U	ug/l	NC
8270C	Butylbenzylphthalate	10.3	U	10.3	U	ug/l	NC
8270C	Chysene	10.3	U	10.3	U	ug/l	NC
8270C	Di-N-Butylphthalate	10.3	U	10.3	U	ug/l	NC
8270C	Di-n-octylphthalate	10.3	U	10.3	U	ug/l	NC
8270C	Dibenzo(a,h)Anthracene	10.3	U	10.3	U	ug/l	NC
8270C	Dibenzofuran	10.3	U	10.3	U	ug/l	NC
8270C	Diethylphthalate	10.3	U	10.3	U	ug/l	NC
8270C	Dimethylphthalate	10.3	U	10.3	U	ug/l	NC
8270C	Fluoranthene	10.3	U	10.3	U	ug/l	NC
8270C	Fluorene	10.3	U	10.3	U	ug/l	NC
8270C	Hexachlorobenzene	10.3	U	10.3	U	ug/l	NC
8270C	Hexachlorobutadiene	10.3	U	10.3	U	ug/l	NC
8270C	Hexachlorocyclopentadiene	10.3	U	10.3	U	ug/l	NC
8270C	Hexachloroethane	10.3	U	10.3	U	ug/l	NC
8270C	Indeno(1,2,3-cd)pyrene	10.3	U	10.3	U	ug/l	NC
8270C	Isophorone	10.3	U	10.3	U	ug/l	NC
8270C	N-Nitroso-di-n-propylamine	10.3	U	10.3	U	ug/l	NC
8270C	Diphenylamine/n-Nitrosodiohenylamine	10.3	U	10.3	U	ug/l	NC
8270C	Naphthalene	10.3	U	10.3	U	ug/l	NC
8270C	Nitrobenzene	10.3	U	10.3	U	ug/l	NC
8270C	Pentachlorophenol	41.2	U	41.2	U	ug/l	NC
8270C	Phenanthrene	10.3	U	10.3	U	ug/l	NC
8270C	Phenol	10.3	U	10.3	U	ug/l	NC
8270C	Pyrene	10.3	U	10.3	U	ug/l	NC
8290A	2,3,7,8-TCDD	7.48	U	7.65	U	pg/L	NC
8290A	1,2,3,7,8-PeCDD	37.5	U	38.4	U	pg/L	NC

8290A	1,2,3,4,7,8-HxCDD	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,6,7,8-HxCDD	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,7,8,9-HxCDD	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,6,7,8-HpCDD	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,6,7,8,9-OCDD	74.8	U	76.5	U	pg/L	NC
8290A	2,3,7,8-TCDF	7.48	U	7.65	U	pg/L	NC
8290A	1,2,3,7,8-PeCDF	37.5	U	38.4	U	pg/L	NC
8290A	2,3,4,7,8-PeCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,7,8-HxCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,6,7,8-HxCDF	37.5	U	38.4	U	pg/L	NC
8290A	2,3,4,6,7,8-HxCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,7,8,9-HxCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,6,7,8-HpCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,7,8,9-HpCDF	37.5	U	38.4	U	pg/L	NC
8290A	1,2,3,4,6,7,8,9-OCDF	74.8	U	76.5	U	pg/L	NC
8290A	Total Tetrachlorodibenzo-p-dioxin	7.48	U	7.65	U	pg/L	NC
8290A	Total Pentachlorodibenzo-p-dioxin	37.5	U	38.4	U	pg/L	NC
8290A	Total Hexachlorodibenzo-p-dioxin	37.5	U	38.4	U	pg/L	NC
8290A	Total Heptachlorodibenzo-p-dioxin	37.5	U	38.4	U	pg/L	NC
8290A	Total Tetrachlorodibenzofuran	7.48	U	7.65	U	pg/L	NC
8290A	Total Pentachlorodibenzofuran	37.5	U	38.4	U	pg/L	NC
8290A	Total Hexachlorodibenzofuran	37.5	U	38.4	U	pg/L	NC
8290A	Total Heptachlorodibenzofuran	37.5	U	38.4	U	pg/L	NC
6010B	Aluminum	0.2	U	0.2	U	mg/l	NC
6010B	Beryllium	0.002	U	0.002	U	mg/l	NC
6010B	Calcium	106		103		mg/l	3.0%
6010B	Iron	0.1	U	0.1	U	mg/l	NC
6010B	Lead	0.01	U	0.01	U	mg/l	NC
6010B	Magnesium	26.5		26.2		mg/l	1.0%
6010B	Potassium	1.41		1.36		mg/l	4.0%
6010B	Sodium	63.3		62.3		mg/l	2.0%
6010B	Vanadium	0.01	U	0.01	U	mg/l	NC
6010B	Zinc	0.02	U	0.02	U	mg/l	NC
6010B	Iron Dissolved	0.1	U	0.1	U	mg/l	NC
6020	Silver	0.001	U	0.001	U	mg/l	NC
6020	Antimony	0.001	U	0.001	U	mg/l	NC
6020	Arsenic	0.000645	J	0.000735	J	mg/l	13%
6020	Barium	0.0357		0.0353		mg/l	1.0%
6020	Cadmium	0.0006	U	0.0006	U	mg/l	NC
6020	Chromium	0.002	U	0.001	J	mg/l	NC
6020	Cobalt	0.0009	J	0.0009	J	mg/l	0%
6020	Copper	0.002	U	0.002	U	mg/l	NC
6020	Manganese	0.00138	J	0.00169	J	mg/l	20%
6020	Nickel	0.005		0.005	J	mg/l	0%
6020	Selenium	0.006		0.006		mg/l	0%
6020	Thallium	0.0002	U	0.0002	U	mg/l	NC
6020	Manganese	0.001	J	0.002	U	mg/l	NC
7470A	Mercury	0.0002	U	0.0002	U	mg/l	NC
300	Chloride	44.5		42.7		mg/l	4.0%
300	Sulfate	166		160		mg/l	4.0%
9040C	pH	7.58		7.58		S.U.	0.0%
310.2	Alkalinity	199		197		mg/l	1.0%
353.2	Nitrate-Nitrite (as N)	24.7		25.3		mg/l	2.0%
350.1	Ammonia (as N)	0.0797	J	0.128		mg/l	46%

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050363 & L13050364

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 11, 2013

Matrix: Groundwater; three samples

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery Group: L13050363
L13050364 (CFA WO 4811)

Sample Nos.: HTA15-0513-1, HTA16D-0513-1, and HTA25-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010*; *Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050363 & L13050364
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	7	NA	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	NA	NA	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Metals 6010B	✓	✓	✓	✓	NA	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	✓	✓	NA	NA	✓
pH 9040C	✓	✓	✓	NA	NA	✓	NA	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. The sample was analyzed at 10,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Benzoic Acid and Butyl Benzyl Phthalate failed percent difference criteria in the CCV associated with field sample analysis. Benzoic Acid, and Butyl Benzyl Phthalate results in the field samples were non-detect above the LOD. Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. Bis(2-Ethylhexyl)phthalate was detected in the method blank. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and was not detected in the samples associated with this method blank which resulted in sample results reported as not detected (U). CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG due to insufficient volume of sample.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for bis(2-Ethylhexyl)phthalate. Because the analyte was not detected in any samples in the batch, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. High %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Nitroglycerin and Nitrobenzene. Because the analyte was not detected in any samples in the batch, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 2.7°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG..

VIII. Other

A. LOQ was reviewed and found to be in compliance.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were analyzed on a sample not associated with this site (not WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliance. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample HTA25-0513-1. MS/MSD recoveries are found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 5-times dilution analyses.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. Hydrogen ion activities (pH) were measured in the field at the time of sample collection and again at the laboratory.

III. Calibration

A. pH meter calibration at the laboratory was documented using buffer solutions pH 4, 7, and 10.

IV. LCS

A. The LCS sample pH was measured at the laboratory and the results were acceptable.

V. Duplicate

A. A laboratory duplicate sample analysis was evidenced on the sample run bench sheet. Precision was acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance.

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ were reviewed and found to be in compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 10 and 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050363 & L13050364

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, three samples: HTA15-0513-1, HTA16D-0513-1, and HTA25-0513-1.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Benzoic Acid and Butyl Benzyl Phthalate failed percent difference criteria in the CCV associated with field sample analysis. Benzoic Acid, and Butyl Benzyl Phthalate results in the field samples were non-detect above the LOD. Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. Bis(2-Ethylhexyl)phthalate was detected in the method blank. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and was detected in the samples associated with this method blank which resulted in sample results reported as not detected (U). CCB analysis results were reviewed and found to be in compliance.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050427 & L13050428

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 12, 2013

Matrix: Groundwater; two samples

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery L13050427
Group L13050428 (CFA WO 4812)

Sample Nos.: HTA103-0513-1, and HTA104-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010*; *Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050427 & L13050428
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	7	NA	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	NA	NA	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Metals 6010B	✓	✓	✓	✓	NA	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	NA	NA	✓
pH 9040C	✓	✓	✓	NA	NA	✓	NA	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. The sample was analyzed at 10,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid and Butyl Benzyl Phthalate failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. Bis(2-Ethylhexyl)phthalate was detected in the method blank extracted on 5/9/13. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and was detected in the samples HTA104-0513-1 at the concentration between LOD and LOQ. This sample was re-extracted within hold time on 5/14/13. Bis(2-Ethylhexyl)phthalate was not detected in the re-extract method blank and the associated field sample. Bis(2-Ethylhexyl)phthalate was not detected in sample HTA103-0513-1 associated with MB extracted on 5/9/13, which resulted in sample results reported as not detected (U). Analytical results for both extracted will be reported. CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG due to insufficient volume of sample.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for bis(2-Ethylhexyl)phthalate and Benzoic acid. Because

these analyte were not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. High %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Nitroglycerin and Nitrobenzene. Because the analyte was not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 2.7°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG..

VIII. Other

A. LOQ was reviewed and found to be in compliance.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were analyzed on a sample not associated with this site (not WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliance. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 5-times dilution analyses.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. Hydrogen ion activities (pH) were measured in the field at the time of sample collection and again at the laboratory.

III. Calibration

A. pH meter calibration at the laboratory was documented using buffer solutions pH 4, 7, and 10.

IV. LCS

A. The LCS sample pH was measured at the laboratory and the results were acceptable.

V. Duplicate

A. A laboratory duplicate sample analysis was evidenced on the sample run bench sheet. Precision was acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance.

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ were reviewed and found to be in compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050427 & L13050428

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples: HTA103-0513-1, and HTA104-0513-1.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid and Butyl Benzyl Phthalate failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, Benzoic Acid, and Butyl Benzyl Phthalate results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, with the few exceptions noted as follows. Bis(2-Ethylhexyl)phthalate was detected in the method blank extracted on 5/9/13. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and was detected in the samples HTA104-0513-1 at the concentration between LOD and LOQ. This sample was re-extracted within hold time on 5/14/13. Bis(2-Ethylhexyl)phthalate was not detected in the re-extract method blank and the associated field sample. Bis(2-Ethylhexyl)phthalate was not detect in sample HTA103-0513-1 associated with MB extracted on 5/9/13, which resulted in sample results reported as not detected (U). Analytical results for both extracted will be reported. CCB analysis results were reviewed and found to be in compliance.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050525 & L13050526

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 13, 2013

Matrix: Groundwater; two samples

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery Group: L13050525
L13050526 (CFA WO 4820)

Sample Nos.: HTA101-0513-1, and HTA102-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010; Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050525 & L13050526
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	7	NA	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	NA	NA	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Metals 6010B	✓	✓	✓	✓	✓	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	NA	NA	✓
pH 9040C	✓	✓	✓	NA	NA	✓	NA	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. The sample was analyzed at 1,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, and Benzoic Acid results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG due to insufficient volume of sample.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Benzoic acid. Because these analyte were not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. High %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Nitroglycerin and Nitrobenzene. Because the analyte was not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 1.1°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG..

VIII. Other

A. LOQ was reviewed and found to be in compliance.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were analyzed on a sample HTA102-0513-1. MS recovery is within criteria. Calcium and Magnesium in the MSD fail percent recovery low due to matrix interference. .

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 5-times dilution analyses.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. Hydrogen ion activities (pH) were measured in the field at the time of sample collection and again at the laboratory.

III. Calibration

A. pH meter calibration at the laboratory was documented using buffer solutions pH 4, 7, and 10.

IV. LCS

A. The LCS sample pH was measured at the laboratory and the results were acceptable.

V. Duplicate

A. A laboratory duplicate sample analysis was evidenced on the sample run bench sheet. Precision was acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance.

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ were reviewed and found to be in compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG.

VII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050525 & L13050526

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples: HTA101-0513-1, and HTA102-0513-1.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, and Benzoic Acid results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050570 & L13050572

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 17, 2013

Matrix: Groundwater; two samples and one field duplicate

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery L13050570
Group L13050572 (CFA WO 4819)

Sample Nos.: HTA13-0512-1, HTA105-0512-1, and HTA105-0512-2

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010; Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050570 & L13050572
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	7	NA	✓	✓	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	✓	NA	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	✓	NA	✓
Metals 6010B	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	✓	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	✓	✓	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	✓	NA	✓
pH 9040C	✓	✓	✓	NA	NA	✓	✓	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	✓	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	✓	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	✓	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	✓	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Other

A. The sample was analyzed at 500 and 10,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, and Benzoic Acid results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG due to insufficient volume of sample.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent RPDs failed criteria for Benzoic acid. Because this analyte was not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. One field duplicate sample was submitted in this SDG. Precision measures were not calculated as all results were non-detect for the analytes of interest.

VIII. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Low %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent recoveries and RPDs failed criteria for Nitroglycerin and Nitrobenzene. Because the analyte was not detected in any samples in this SDG, the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 4.9°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this SDG..

VIII. Other

A. LOQ was reviewed and found to be in compliance.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were analyzed on a sample HTA102-0513-1. MS recovery is within criteria. Calcium and Magnesium in the MSD fail percent recovery low due to matrix interference. .

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were analyzed on a sample not associated with this site (not a WSMR groundwater sample). MS/MSD recoveries are not applicable for comparison to project samples.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 2 and 5-times dilution analyses.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. Hydrogen ion activities (pH) were measured in the field at the time of sample collection and again at the laboratory.

III. Calibration

A. pH meter calibration at the laboratory was documented using buffer solutions pH 4, 7, and 10.

IV. LCS

A. The LCS sample pH was measured at the laboratory and the results were acceptable.

V. Duplicate

A. A laboratory duplicate sample analysis was evidenced on the sample run bench sheet. Precision was acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance.

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VII. Other

A. LOQ were reviewed and found to be in compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VII. Other

A. LOQ was reviewed and found to be in compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. LCS

A. The LCS results were reviewed and found to be in compliance

VI. Duplicate

A. One field duplicate sample was submitted for this sample delivery group (SDG).

VII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 4 and 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050570 & L13050572

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples and one field duplicate: HTA13-0512-1, HTA105-0512-1, and HTA105-0512-2.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent difference for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. 2,4-Dinitrophenol, and Benzoic Acid results in the field samples were non-detect above the LOD. 2,4-Dinitrophenol, and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

Method	Parameter	Parent Sample HTA105-0512-1	Qual	Duplicate Sample HTA105-0512-2	Qual	Units	RPD
6850	Perchlorate	17700		17100		ug/l	3%
8330B	1,3,5-Trinitrobenzene	1.10	U	1.10	U	ug/l	NC
8330B	1,3-Dinitrobenzene	1.10	U	1.10	U	ug/l	NC
8330B	2,4,6-Trinitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	2,4-Dinitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	2,6-Dinitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	2-Amino-4,6-dinitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	2-Nitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	3-Nitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	4-Nitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	4-Amino-2,6-dinitrotoluene	1.10	U	1.10	U	ug/l	NC
8330B	HMX	1.10	U	1.10	U	ug/l	NC
8330B	Nitrobenzene	1.10	U	1.10	U	ug/l	NC
8330B	RDX	21.4	U	18.8	U	ug/l	NC
8330B	Tetryl	1.10	U	1.10	U	ug/l	NC
8330B	Nitroglycerin	1.10	U	1.10	U	ug/l	NC
8330B	PETN	1.10	U	1.10	U	ug/l	NC
8270C	1,2,4-Trichlorobenzene	11.1	U	11.1	U	ug/l	NC
8270C	1,2-Dichlorobenzene	11.1	U	11.1	U	ug/l	NC
8270C	1,3-Dichlorobenzene	11.1	U	11.1	U	ug/l	NC
8270C	1,4-Dichlorobenzene	11.1	U	11.1	U	ug/l	NC
8270C	2,4,5-Trichlorophenol	11.1	U	11.1	U	ug/l	NC
8270C	2,4,6-Trichlorophenol	11.1	U	11.1	U	ug/l	NC
8270C	2,4-Dichlorophenol	11.1	U	11.1	U	ug/l	NC
8270C	2,4-Dinitrophenol	44.4	U	44.4	U	ug/l	NC
8270C	2,4-Dinitrotoluene	11.1	U	11.1	U	ug/l	NC
8270C	2,6-Dinitrotoluene	11.1	U	11.1	U	ug/l	NC
8270C	2-Chloronaphthalene	11.1	U	11.1	U	ug/l	NC
8270C	2-Chlorophenol	11.1	U	11.1	U	ug/l	NC
8270C	2-Methylnaphthalene	11.1	U	11.1	U	ug/l	NC
8270C	2-methylphenol	11.1	U	11.1	U	ug/l	NC
8270C	2-Nitroaniline	44.4	U	44.4	U	ug/l	NC
8270C	2-Nitrophenol	11.1	U	11.1	U	ug/l	NC
8270C	3,3'-Dichlorobenzidine	11.1	U	11.1	U	ug/l	NC
8270C	3-,4-Methylphenol	11.1	U	11.1	U	ug/l	NC
8270C	3-Nitroaniline	44.4	U	44.4	U	ug/l	NC
8270C	4,6-Dinitro-2-methylphenol	44.4	U	44.4	U	ug/l	NC

8270C	4-Bromophenyl-phenylther	11.1	U	11.1	U	ug/l	NC
8270C	4-Chloro-3-methylphenol	11.1	U	11.1	U	ug/l	NC
8270C	4-Chloroaniline	11.1	U	11.1	U	ug/l	NC
8270C	4-Chlorophenyl-phenyl ether	11.1	U	11.1	U	ug/l	NC
8270C	4-Nitroaniline	44.4	U	44.4	U	ug/l	NC
8270C	4-Nitrophenol	44.4	U	44.4	U	ug/l	NC
8270C	Acenaphthene	11.1	U	11.1	U	ug/l	NC
8270C	Acenaphthylene	11.1	U	11.1	U	ug/l	NC
8270C	Anthracene	11.1	U	11.1	U	ug/l	NC
8270C	Benzo(a)anthracene	11.1	U	11.1	U	ug/l	NC
8270C	Benzo(a)pyrene	11.1	U	11.1	U	ug/l	NC
8270C	Benzo(b)fluoranthene	11.1	U	11.1	U	ug/l	NC
8270C	Benzo(g,h,i)perylene	11.1	U	11.1	U	ug/l	NC
8270C	Benzo(k)fluoranthene	11.1	U	11.1	U	ug/l	NC
8270C	Benzoic acid	44.4	U	44.4	U	ug/l	NC
8270C	Benzyl alcohol	11.1	U	11.1	U	ug/l	NC
8270C	Bis(2-Chloroethoxy)Methane	11.1	U	11.1	U	ug/l	NC
8270C	Bis(2-Chloroethyl)ether	11.1	U	11.1	U	ug/l	NC
8270C	Bis(20Chloroisopropyl)ether	11.1	U	11.1	U	ug/l	NC
8270C	Bis(2-Ethylhexyl)phthalate	11.1	U	11.1	U	ug/l	NC
8270C	Butylbenzylphthalate	11.1	U	11.1	U	ug/l	NC
8270C	Chysene	11.1	U	11.1	U	ug/l	NC
8270C	Di-N-Butylphthalate	11.1	U	11.1	U	ug/l	NC
8270C	Di-n-octylphthalate	11.1	U	11.1	U	ug/l	NC
8270C	Dibenzo(a,h)Anthracene	11.1	U	11.1	U	ug/l	NC
8270C	Dibenzofuran	11.1	U	11.1	U	ug/l	NC
8270C	Diethylphthalate	11.1	U	11.1	U	ug/l	NC
8270C	Dimethylphthalate	11.1	U	11.1	U	ug/l	NC
8270C	Fluoranthene	11.1	U	11.1	U	ug/l	NC
8270C	Fluorene	11.1	U	11.1	U	ug/l	NC
8270C	Hexachlorobenzene	11.1	U	11.1	U	ug/l	NC
8270C	Hexachlorobutadiene	11.1	U	11.1	U	ug/l	NC
8270C	Hexachlorocyclopentadiene	11.1	U	11.1	U	ug/l	NC
8270C	Hexachloroethane	11.1	U	11.1	U	ug/l	NC
8270C	Indeno(1,2,3-cd)pyrene	11.1	U	11.1	U	ug/l	NC
8270C	Isophorone	11.1	U	11.1	U	ug/l	NC
8270C	N-Nitroso-di-n-propylamine	11.1	U	11.1	U	ug/l	NC
8270C	Diphenylamine/n-Nitrosodiohenylamine	11.1	U	11.1	U	ug/l	NC
8270C	Naphthalene	11.1	U	11.1	U	ug/l	NC
8270C	Nitrobenzene	11.1	U	11.1	U	ug/l	NC
8270C	Pentachlorophenol	44.4	U	44.4	U	ug/l	NC
8270C	Phenanthrene	11.1	U	11.1	U	ug/l	NC
8270C	Phenol	11.1	U	11.1	U	ug/l	NC
8270C	Pyrene	11.1	U	11.1	U	ug/l	NC
8290A	2,3,7,8-TCDD	7.77	U	7.59	U	pg/L	NC
8290A	1,2,3,7,8-PeCDD	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,7,8-HxCDD	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,6,7,8-HxCDD	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,7,8,9-HxCDD	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,6,7,8-HpCDD	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,6,7,8,9-OCDD	77.7	U	75.9	U	pg/L	NC
8290A	2,3,7,8-TCDF	7.77	U	7.59	U	pg/L	NC
8290A	1,2,3,7,8-PeCDF	39.0	U	38.1	U	pg/L	NC
8290A	2,3,4,7,8-PeCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,7,8-HxCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,6,7,8-HxCDF	39.0	U	38.1	U	pg/L	NC
8290A	2,3,4,6,7,8-HxCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,7,8,9-HxCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,6,7,8-HpCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,7,8,9-HpCDF	39.0	U	38.1	U	pg/L	NC
8290A	1,2,3,4,6,7,8,9-OCDF	77.7	U	75.9	U	pg/L	NC

8290A	Total Tetrachlorodibenzo-p-dioxin	7.77	U	7.59	U	pg/L	NC
8290A	Total Pentachlorodibenzo-p-dioxin	39.0	U	38.1	U	pg/L	NC
8290A	Total Hexachlorodibenzo-p-dioxin	39.0	U	38.1	U	pg/L	NC
8290A	Total Heptachlorodibenzo-p-dioxin	39.0	U	38.1	U	pg/L	NC
8290A	Total Tetrachlorodibenzofuran	7.77	U	7.59	U	pg/L	NC
8290A	Total Pentachlorodibenzofuran	39.0	U	38.1	U	pg/L	NC
8290A	Total Hexachlorodibenzofuran	39.0	U	38.1	U	pg/L	NC
8290A	Total Heptachlorodibenzofuran	39.0	U	38.1	U	pg/L	NC
6010B	Aluminum	0.2	U	0.2	U	mg/l	NC
6010B	Beryllium	0.002	U	0.002	U	mg/l	NC
6010B	Calcium	95.9		98		mg/l	2%
6010B	Iron	0.1	U	0.1	U	mg/l	NC
6010B	Lead	0.005		0.01	U	mg/l	NC
6010B	Magnesium	24.9		25.3		mg/l	2%
6010B	Potassium	2.24		2.28		mg/l	2%
6010B	Sodium	59.2		60.8		mg/l	3%
6010B	Vanadium	0.01	U	0.01	U	mg/l	NC
6010B	Zinc	0.217		0.223		mg/l	3%
6010B	Iron Dissolved	0.1	U	0.1	U	mg/l	NC
6020	Silver	0.001	U	0.001	U	mg/l	NC
6020	Antimony	0.001	U	0.001	U	mg/l	NC
6020	Arsenic	0.0009	J	0.0009	J	mg/l	0%
6020	Barium	0.0373		0.0373		mg/l	0%
6020	Cadmium	0.0006	U	0.0006	U	mg/l	NC
6020	Chromium	0.002	U	0.002	U	mg/l	NC
6020	Cobalt	0.00221		0.00225		mg/l	2%
6020	Copper	0.00149	J	0.00150	J	mg/l	1%
6020	Manganese	0.00857		0.00897		mg/l	5%
6020	Nickel	0.005		0.005		mg/l	0%
6020	Selenium	0.00437		0.00478		mg/l	9%
6020	Thallium	0.0002	U	0.0002	U	mg/l	NC
6020	Manganese	0.00756		0.00832		mg/l	10%
7470A	Mercury	0.0002	U	0.0002	U	mg/l	NC
300	Chloride	48.7		48.3		mg/l	1%
300	Sulfate	166		166		mg/l	0%
9040C	pH	7.26		7.25		S.U.	0%
310.2	Alkalinity	228		225		mg/l	1%
353.2	Nitrate-Nitrite (as N)	10.3		10.4		mg/l	1%
350.1	Ammonia (as N)	0.0783	J	0.0877	J	mg/l	11%

COC No. A 35155

158 Starlite Drive
Marietta, OH 45750



Phone: 740-373-4071
Fax: 740-373-4835



CHAIN-OF-CUSTODY RECORD

Company Name: **C B E I**

Project Contact: **Mark Lyon**
Contact Phone #: **505-262-8920**

Turn Around Requirements: **Normal**
Location: **HTA 0B/0D**

Project ID: **HTA 0B/0D**

Sampler (print): **Allison Jenness**
Signature: *[Signature]*

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*
HTA 17-0513-1	X	X	5-13-13	1245	W
HTA 10A-0513.1	X	X	5-13-13	1400	W

Hold	TAL Metals 6010 B 6020 A	Mercury 7430 A	Iron + Manganese (dissolved)	Anions - Sulfate + Chloride	Alkalinity 310.2	SVOC 8270C	Dioxins/Furans	Nitroaromatics 8330B	Nitramines 8330B	Perchlorate 6850	Ammonia as N 350.1	Nitrate + Nitrite as N - 353.2	TOTAL # (LAB USE)	Program	ADDITIONAL REQUIREMENTS
	X	X	X	X	X	X	X	X	X	X	X	X		<input type="checkbox"/> CWA <input type="checkbox"/> RCRA <input type="checkbox"/> DOD <input type="checkbox"/> AFCEE <input type="checkbox"/> Other	
	X	X	X	X	X	X	X	X	X	X	X	X			

Relinquished by: *[Signature]* Date: **5-13-13** Time: **1530**

Relinquished by: *[Signature]* Date: **5-13-13** Time: **17:17**

Microbac OVD
Received: 05/14/2013 17:17
By: ROSEMARY SCOTT

221000035920

Remarks:

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050694 & L13050695

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 21, 2013

Matrix: Groundwater; two samples

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
pH 9040C
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery L13050694
Group L13050695 (CFA WO 4825)

Sample Nos.: HTA17-0513-1, and HTA10A-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010; Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050694 & L13050695
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	✓	NA	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	NA	NA	✓
Explosives 8330B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Metals 6010B	✓	✓	✓	✓	NA	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	NA	NA	✓
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. The sample was analyzed at 10,000 and 1,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag "UN" for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance. with exceptions. Percent RPDs failed criteria for 25 analytes. Because these analytes were not detected in any samples in this SDG the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

- A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Low %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 0.0°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliance.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were not reported for this SDG.

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliance. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 2 and 5-times dilution analyses.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliance.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliance.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 4 and 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050694 & L13050695

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples: HTA17-0513-1 and HTA10A-0513-1.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol run date 5/10/13 failed criteria in alternate source calibration checks. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

No sample data were qualified in this SDG.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050735 & L13050736

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 21, 2013

Matrix: Groundwater; two samples

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery Group: L13050735
L13050736 (CFA WO 4840)

Sample Nos.: HTA20-0513-1, and HTA11-0513-1

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010*; *Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050735 & L13050736
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	✓	NA	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	NA	✓	NA	NA	✓
Explosives 8330B	✓	✓	9	✓	NA	✓	NA	NA	✓
Metals 6010B	✓	✓	✓	✓	NA	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	NA	NA	✓
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	NA	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	NA	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. The sample was analyzed at 10,000 and 1,000-times dilutions due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance. with exceptions. Percent RPDs failed criteria for Pentachlorophenol. Because this analyte was not detected in any samples in this SDG the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

- A. Surrogates were added to all environmental and QC samples and standards as required by the referenced methodology. All surrogate recoveries were reviewed and found to be in compliance with the exceptions. High surrogate recovery was observed for 2,4,6 - Tribromophenol in sample ID HTA20-0513-1 and HTA11-0513-1. Method blank and LCS surrogates recovery were within criteria. No data in this SDG were qualify due to high surrogate recovery due to no target analyte was detected in any samples.

- B. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Low %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. Tetryl results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 3.7°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. MS/MSD analyses were not reported for this SDG.

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliance. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 2 -times dilution analyses.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliance.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliance.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD analyses were not reported for this SDG.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 4 and 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050735 & L13050736

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples: HTA20-0513-1 and HTA11-0513-1.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Low %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. Tetryl results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.

COC No. A 35159



158 Starlite Drive
Marietta, OH 45750



Phone: 740-373-4071
Fax: 740-373-4835

CHAIN-OF-CUSTODY RECORD

Company Name: **C B & I**

Project Contact: **Mack Lyon**
Contact Phone #: **505-262-8920**

Turn Around Requirements: **Normal**
Location: **HTA 0B/0D**

Project ID: **HTA 0B/0D**

Sampler (print): **Bradley T. Davis**
Signature: *Bradley T. Davis*

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*
HTA 16-0513-1	X	X	5-15-13	1020	W
HTA 3-0513-1	X	X	5-15-13	1220	W
HTA 3-0513-MS	X	X	5-15-13	1220	W
HTA 3-0513-MSA	X	X	5-15-13	1220	W

Hold	NUMBER OF CONTAINERS	TRM Metals 6018	Mercury 2770A	Iron + Manganese (dissol)	Ammonia - Nitrate & Nitrites N -	Alkalinity - 310.2	SVOC 8270C	Dioxins/Furans	Nitroaromatics 8330B	Nitramines 8330B	Perchlorate 10850	Ammonia as N 3501	Nitrate + Nitrites N -	353.2	TOTAL # (LAB USE)
	13	X	X	X	X	X	X	X	X	X	X	X	X		
	13	X	X	X	X	X	X	X	X	X	X	X	X		
	13	X	X	X	X	X	X	X	X	X	X	X	X		
	13	X	X	X	X	X	X	X	X	X	X	X	X		

Program

CWA

RCRA

DOD

AFCEE

Other

ADDITIONAL REQUIREMENTS

Relinquished by: *Bradley T. Davis* Date: **5-15-13** Time: **1500**

Relinquished by: (Signature) Date: Time:

Received by: (Signature) Date: Time:

Microbac OVD
Received: 05/16/2013 15:12
By: BOB BUCHANAN
221000096071

Bob Buchanan

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13050807 & L13050808

Project / Site Name: Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-11, Open Burn/Open Detonation (OB/OD) Area

Project No.: 139791

Data Reviewer: Patricia Flynn, CB&I Federal Services Environmental, Inc.

Review Date: June 20, 2013

Matrix: Groundwater; two samples and extra volume for MS/MSD

Parameters: Perchlorate 6850
Semi Volatile Organic Compounds (SVOCs) 8270C
Explosives 8330B
Dioxin / Furans 8290A
Metals 6010B/6020/7470A
Anions 300.0
Alkalinity 310.2
Ammonia 350.1
Nitrate+Nitrite-Nitrogen 353.2

Validation Level: EPA Level III

Laboratory: Microbac Laboratories, Inc. Ohio Valley Division
Cape Fear Analytical LLC

Sample Delivery Group: L13050807
L13050808 (CFA WO 4851)

Sample Nos.: HTA16-0513-1, HTA3-0513-1, HTA3-0513-1MS,
and HTA3-0513-1MSD

Comments: Trip blank sample not applicable.

The data were reviewed and qualified according to the *Sampling and Analysis Plan/Quality Assurance Project Plan, Environmental Remediation Services, White Sands Missile Range, New Mexico October 2010; Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 4.2, 2010*; laboratory-specific statistical process control criteria, and the analytical method specific requirements.

DATA VALIDATION REQUIREMENTS

Level IV or Full Validation includes all parameters listed below. Level III Cursory Validation parameters are indicated by an asterisk (*).

Organic Parameters

- * Temperature
- * Holding times
- GC/MS instrument performance check
- * Initial and continuing calibrations
- * Blanks
- * Surrogate recoveries
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Internal standard performance
- Target compound identification
- Tentatively identified compounds
- Compound quantitation
- Reported detection limits
- System performance
- * Overall data assessment

Inorganic and General Chemistry Parameters

- * Temperature
- * Holding times
- * Initial and continuing calibration
- * Blanks
- * Matrix spike/matrix spike duplicate
- * Laboratory control sample / blank spike
- * Field duplicate
- * Matrix duplicate
- ICP interference check sample
- CVAA / GFAA quality controls
- * ICP serial dilution
- Sample results verification
- Analyte quantitation
- Reported detection limits
- * Overall data assessment

DATA VALIDATION QUALIFIER DEFINITIONS

No qualifier indicates that the data are acceptable both qualitatively and quantitatively.

- U Not detected. The analyte was analyzed for but was not detected above the level of the associated value. The associated value is the Limit of Quantitation (LOQ).
- J Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is in determinable.
- J- Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined low due to associated quality control indicators.
- J+ Estimated. The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample and the bias is determined high due to associated quality control indicators.
- N Tentatively identified. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- UN Tentatively not detected, the LOQ is estimated. The analyte was analyzed for but was not detected above the reported LOQ. However, the reported LOQ is an estimate and may not be accurate or precise.
- NJ Tentatively identified. The reported concentration is an estimate. The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification and the associated numerical value represents the approximate concentration.
- R Rejected. The data are not usable. The presence or absence of the analyte cannot be confirmed.

DATA VALIDATION QUALIFIER REASON CODES

Reason Code	Data Quality Condition Resulting in Assigned Qualification
General Use	
FB	Field blank contamination
FD	Field duplicate evaluation criteria not met
HT	Holding time requirement was not met
PR	Preservation requirements not met
LCS	Laboratory control sample evaluation criteria not met
MB	Method blank or preparation blank contamination
RB	Rinsate blank contamination
TB	Trip blank contamination
SDL	Sample quantitation limit exceeds decision criteria and the analyte was not detected
Inorganic Methods	
CCB	Continuing calibration blank contamination
CCV	Continuing calibration verification evaluation criteria not met
D	Laboratory duplicate precision evaluation criteria not met
DL	Serial dilution results did not meet evaluation criteria
ICS	Interference check sample evaluation criteria not met
ICV	Initial calibration verification evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient < 0.995
PB	Preparation blank
Organic Methods	
CCAL	Continuing calibration evaluation criteria not met
ICAL	Initial calibration evaluation criteria not met
ID	Target compound identification criteria not met
IS	Internal standard evaluation criteria not met
MS/MSD	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
SUR	Surrogate recovery outside acceptance range
TUNE	Instrument performance (tuning) criteria not met
P	The detected concentration difference between the primary and secondary column is greater than 25%.

**SAMPLE DELIVERY GROUP L13050807 & L13050808
LEVEL III DATA VALIDATION SUMMARY**

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Semivolatiles Organic 8270C	✓	✓	7	✓	✓	✓	NA	NA	✓
Perchlorate 6850	✓	✓	✓	✓	✓	✓	NA	NA	✓
Explosives 8330B	✓	✓	✓	✓	✓	✓	NA	NA	9
Metals 6010B	✓	✓	✓	✓	✓	✓	NA	✓	✓
Metals 6020	✓	✓	✓	✓	✓	✓	NA	✓	✓
Mercury 7470A	✓	✓	✓	✓	✓	✓	NA	✓	✓
Anions 300.0	✓	✓	✓	✓	✓	✓	NA	NA	✓
Alkalinity 310.2/SM2320B	✓	✓	✓	✓	✓	✓	NA	NA	✓
Ammonia – N 350.1	✓	✓	✓	✓	✓	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	✓	✓	NA	NA	✓
Dioxins / Furans 8290A	✓	✓	✓	✓	✓	✓	NA	NA	✓

Notes:

✓ Indicates that all quality control criteria were met for the parameter(s)

N/A Indicates the validation criteria is not applicable to the analysis

If validation criteria were not met and the data were qualified, then details can be found at the page number indicated in the table.

DATA ASSESSMENT
PERCHLORATE (Method 6850)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. The sample was analyzed at 10,000-times dilutions for HTA16-0513-1 due to the high concentration of the target analytes.

Semivolatile Organics (Method 8270C)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

IV. Blanks

A. The field sample results were evaluated with respect to the laboratory method blanks prepared and analyzed for each analytical batch. Target analytes were not detected in the laboratory method blanks, CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1. Recoveries and/or RPDs out of range were observed for 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2-chlorophenol, 2-methylphenol, 3,3'-Dichlorobenzidine, 3,4-Methylphenol, 4,6-Dinitro-2-methyl phenol, and 4-chloro-3-methylphenol. Data qualifiers were not assigned to the field sample due to MS/MSD outlier because these compounds were not detected in the field samples. All other compounds results were reviewed and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance with exceptions. Percent RPDs failed criteria for Pentachlorophenol. Because this analyte were not detected in any samples in this SDG the high biased LCS recovery did not affect the sample results and thus no data qualification was warranted.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant.

EXPLOSIVES (Method 8330B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Low %D was observed for Tetryl in the alternate source calibration on the confirmation column. Tetryl was not detected in any filed field samples. No data qualification was warranted.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

- A. Surrogates were added to all environmental and QC samples and standards as required by the referenced methodology. All surrogate recoveries were reviewed and found to be in compliance with the exceptions. Low surrogate recovery was observed for 1,2-Dinitrobenzene in sample ID HTA16-0513-1. Noncompliant surrogate recoveries often indicate a matrix interference presence in the sample, and sample data are qualified as estimated (J) for all detected results and UJ for all non-detected results.
- B. Second analysis confirmation was run on all samples with detected results. The original analysis runs data were reported.

Dioxins / Furans (Method 8290A)

I. Temperature

A. Shipping cooler temperatures were measured at 1.3°C upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance..

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant.

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. Initial calibration blank (ICB), continuing calibration blank (CCB), and method blank analysis results were reviewed and found to be in compliance.

V. Matrix Spike / Matrix Spike Duplicate (MS/MSD)

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance..

VI. Laboratory Control Sample (LCS)

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found to be in compliant. Post digest spike results were compliant.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, initial calibration verification (ICV), and continuing calibration verification (CCV), were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Serial Dilution

A. Serial dilution results were reviewed and found to be in compliance.

IX. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration linearity, ICV, and CCV were reviewed and found to be in compliance.

IV. Blanks

A. ICB, CCB, and method blank analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Post digest spike results were compliant.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank and CCB analysis results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance. Recoveries out of range were observed for chloride due to high concentration of target analyte in the spike sample. Data qualifiers were not assigned to the field sample due to MS/MSD outlier because of sample dilution.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant. Chloride and sulfate concentrations were determined from 5-times dilution analyses.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant.

IV. Blanks

A. Method blank results were reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance.

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ were reviewed and found to be in compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperatures were measured at 4°C or less upon receipt at the laboratory. Sample temperature was in compliance.

II. Holding Times

A. The analysis holding times were reviewed and found to be in compliance.

III. Calibration

A. Calibration coefficient of correlation was reviewed and found compliant.

IV. Blanks

A. Method blank was reviewed and found to be in compliance.

V. MS/MSD

A. Site specific MS and MSD samples were submitted on sample ID HTA3-0513-1 and found to be in compliance.

VI. LCS

A. The LCS results were reviewed and found to be in compliance

VII. Duplicate

A. Field duplicate sample was not submitted for analysis with this sample delivery group (SDG).

VIII. Other

A. LOQ was reviewed and found to be in compliant. Nitrate + Nitrite as Nitrogen concentrations were determined from 4 and 8-times dilution analyses.

DATA QUALIFICATION SUMMARY L13050807 & L13050808

CCWS-11, Open Burn/Open Detonation (OB/OD) Area, two samples and one field duplicate: HTA16-0513-1, HTA03-0513-1, HTA03-0513-1MS, and HTA03-0513-1MSD.

Semivolatiles Organic – Data Qualification Summary

Calibration coefficient of determination, alternate source calibration verification, and CCV, were reviewed and found compliant with exceptions. Percent differences for 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, and Pentachlorophenol run date 5/23/13 failed criteria in alternate source calibration checks. Benzoic Acid failed percent difference criteria in the CCV associated with field sample analysis. These compounds were non-detect above the LOD in the field samples. 2,4-Dinitrophenol, 4,6-dinitro-2-methylphenol, Hexachlorocyclopentadiene, Pentachlorophenol and Benzoic Acid results are qualified with the flag “UN” for all field samples in this SDG indicating tentatively undetected and the LOQ is estimated. Reason codes are ICV and CCV indicating initial calibration verification and continuing calibration verification failure.

Perchlorate – Data Qualification Summary

No sample data were qualified in this SDG.

Explosives – Data Qualification Summary

Surrogates were added to all environmental and QC samples and standards as required by the referenced methodology. All surrogate recoveries were reviewed and found to be in compliance with the exceptions. Low surrogate recovery was observed for 1,2-Dinitrobenzene in sample HTA16-0513-1. Noncompliant surrogate recoveries often indicate a matrix interference presence in the sample, and sample data are qualified as estimated (J) for all detected results and UJ for all non-detected results.

Dioxins / Furans – Data Qualification Summary

No sample data were qualified in this SDG.

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

General and Wet Chemistry – Data Qualification Summary

No sample data were qualified in this SDG.

Nitrate plus nitrite – Data Qualification Summary

No sample data were qualified in this SDG.

OVERALL ASSESSMENT OF DATA

I. Compliance with method and project requirements

- A. All analyses were performed within the analytical methods specifications and project requirements.

II. Usability

- A. Based on the quality control criteria reviewed, all unqualified data are usable for project purposes. No data results were qualified during data validation. No data results were rejected as unusable. Data qualifiers assigned by the laboratory in the analytical report include the “J” qualifier when analytes were identified but at concentrations less than the LOQ. Estimated results are usable for limited purposes.

III. Field Duplicate Precision

- A. Field duplicate sample was not submitted for analysis with this SDG.