DATA VALIDATION REPORT
MICROBAC LABORATORY SDG L13110051

Project / Site Name:	Environmental Remediation Services at White Sands Missile Range (WSMR), NM; CCWS-62, Former STP Percolation Ditches
Project No.:	139791
Data Reviewer:	M. Lyon, Shaw Environmental, Inc. a CB&I Company
Review Date:	December 6, 2013
Matrix:	Groundwater, four field samples
Parameters:	Metals 6010B/6020/7470A Anions 300.0 pH 9040C Alkalinity 310.2 Cyanide 9014/9010C/SM4500-CN-C, G/SM4500-CN-I Conductivity 120.1 Ammonia-Nitrogen 350.1 Nitrate+Nitrite-Nitrogen 353.2 Orthophosphate SM4500-P-E-20th Total Dissolved Solids 160.1/SM2540C Total Organic Carbon 415.1 Total Suspended Solids 160.2
Validation Level:	EPA Level III
Laboratory:	Microbac Laboratories, Inc. Ohio Valley Division
Sample Delivery Group	L13110051
Sample Nos.:	MPL28-1013-1, T40-1013-1, MPL17-1013-1, and MPL10-1013-1
Comments:	Field QC samples were not submitted for this SDG.

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 met 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 L13110051
LEVEL III DATA VALIDATION SUMMARY

Analysis / Method	Temperature	Holding Times	Calibration	Blanks	MS/MSD	LCS	Duplicate	Serial Dilution	Other
Metals 6010B	✓	✓	✓	✓	NA	✓	✓	✓	✓
Metals 6020	✓	✓	✓	✓	NA	✓	✓	✓	✓
Mercury 7470A	✓	✓	✓	✓	NA	✓	✓	NA	✓
Anions 300.0	✓	✓	✓	✓	NA	✓	NA	NA	✓
pH 9040C	✓	✓	✓	NA	NA	✓	✓	NA	NA
Alkalinity 310.2/SM2320B	✓	✓	✓	NA	NA	✓	✓	NA	NA
Cyanide; Total, Amenable, Dissociable 9014-9010C/SM4500-CN	✓	✓	✓	✓	NA	✓	NA	NA	✓
Conductivity 120.1	✓	✓	✓	✓	NA	✓	✓	NA	✓
Ammonia-N 350.1	✓	✓	✓	✓	NA	✓	NA	NA	✓
Nitrate+Nitrite-N 353.2	✓	✓	✓	✓	NA	✓	✓	NA	✓
Orthophosphate SM4500-P	✓	✓	✓	✓	NA	✓	✓	NA	✓
Total Dissolved Solids 160.1	✓	✓	NA	NA	NA	✓	✓	NA	NA
Total Organic Carbon 415.1	✓	✓	✓	✓	NA	✓	✓	NA	✓
Total Suspended Solids 160.2	✓	✓	NA	NA	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

METALS (Method 6010B)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 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 performed on an internal laboratory quality control sample, i.e., not a WSMR project sample, for this SDG. MS/MSD recoveries were not evaluated.

VI. Laboratory Control Sample (LCS)

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

VII. Duplicate

A. Field duplicate samples were not submitted for this SDG. Batch MS/MSD precision met acceptance criteria.

VIII. Serial Dilution

A. Serial dilution was performed on a non-WSMR sample in the analytical batch and met criteria.

IX. Other

A. Limits of Quantitation (LOQ) were reviewed and found compliant. Post spike analysis was performed on a non-WSMR sample in the analytical batch and not evaluated.

METALS (Method 6020)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 linearity, ICV, low-level calibration check, 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 performed on an internal laboratory quality control sample, i.e., not a WSMR project sample, for this SDG. MS/MSD results were not evaluated.

VI. LCS

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

VII. Duplicate

A. Field duplicate samples were not submitted for this SDG. MS/MSD precision met acceptance criteria.

VIII. Serial Dilution

A. Serial dilution was performed on sample MPL17-1013-1.

IX. Other

A. LOQ were reviewed and found compliant. Post spike analysis was performed on a non-WSMR sample and not evaluated.

MERCURY (Method 7470A)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 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 performed on an internal laboratory quality control sample, i.e., not a WSMR project sample, for this SDG. MS/MSD results were not evaluated.

VI. LCS

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

VII. Duplicate

A. Field duplicate samples were not submitted for this SDG. MS/MSD precision met acceptance criteria.

VIII. Other

A. LOQ were reviewed and found compliant. Post digest spike was performed on sample MPL28-1013-1 and recovery met specification.

ANIONS (Method 300.0 [9056])

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 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 samples were not submitted for this SDG.

VIII. Other

A. Sample MPL28-1013-1 was analyzed undiluted for fluoride and at 10-times dilution for chloride and sulfate. Samples T40-1013-1, MPL17-1013-1, and MPL10-1013-1 were analyzed at 3-times, 5-times, and 5-times dilutions, respectively. Fluoride was not detected in the latter 3 samples and quantitation limits were elevated by dilution. LOQs for fluoride still meet project requirements.

pH (Method 9040C)

I. Temperature

A. Shipping cooler temperature was measured at 2 °C 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 checked using buffer solutions pH 7.0, 4.0, and 10.0.

IV. LCS

A. The LCS sample pH was indicated on the instrument run log.

V. Duplicate

A. Field duplicate samples were not submitted for this SDG. A laboratory duplicate was analyzed using sample MPL10-1013-1 and precision results were acceptable.

ALKALINITY (Methods 310.2 / SM2320B)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 results were reviewed and found to be in compliance.

V. MS/MSD

A. MS/MSD 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 samples were not submitted for this SDG. An LCS duplicate demonstrated acceptable precision.

CYANIDE (Methods 9014-9010C / SM4500-CN-C)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 correlation was reviewed and found compliant.

IV. Blanks

A. Method blanks were reviewed and found to be in compliance.

V. MS/MSD

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

VI. LCS

A. The LCS results were reviewed and found to be in compliance. Cyanide amenable to chlorination is a difference measurement which the LCS calculation accounts for inversely.

VII. Duplicate

A. A field duplicate sample was not submitted for this SDG.

VIII. Other

A. LOQ was reviewed and found compliant.

CONDUCTIVITY (Method 120.1)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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. Blanks

A. Method blank results were reviewed. Conductivity detected in the method blank applicable to samples from T40, MPL17, and MPL10 samples was greater than ½ the LOQ. However, sample measurements were more than two orders of magnitude greater than the blank level. Validation qualifiers were not qualified.

IV. LCS

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

V. Duplicate

A. A field duplicate sample was not submitted for this SDG. The laboratory LCS duplicate had acceptable precision.

VI. Other

A. LOQ was reviewed and found compliant.

AMMONIA AS NITROGEN (Method 350.1)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 correlation was reviewed and found compliant.

IV. Blanks

A. ICB and CCB were reviewed and found compliant. Method blank result was a negative value the absolute value of which was greater than ½ the LOQ. Validation qualifiers were not assigned.

V. LCS

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

VI. MS/MSD

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

VII. Duplicate

A. A field duplicate sample was not submitted for this SDG.

VIII. Other

A. LOQ was reviewed and found compliant.

NITRATE + NITRITE AS NITROGEN (Method 353.2)

I. Temperature

A. Shipping cooler temperature was measured at 2°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 correlation was reviewed and found compliant.

IV. Blanks

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

VI. MS/MSD

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

VI. LCS

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

VII. Duplicate

A. A field duplicate sample was not submitted for this SDG. Precision for lab control sample duplicate met acceptance criteria.

VIII. Other

A. LOQ was reviewed and found compliant.

ORTHOPHOSPHATE AS PHOSPHOROUS (Method SM4500-P)

I. Temperature

A. Shipping cooler temperature was measured at 2°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 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 were not reported for this SDG.

VI. LCS

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

VII. Duplicate

A. A field duplicate sample was not submitted for this SDG. Precision for LCS duplicate was compliant.

VIII. Other

A. LOQ was reviewed and found compliant.

TOTAL DISSOLVED SOLIDS (Method 160.1)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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. Blanks

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

IV. MS/MSD

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

V. LCS

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

VI. Duplicate

A. A field duplicate sample was not submitted for this SDG. Precision results for the LCS duplicate were in compliance.

VII. Other

A. LOQ was reviewed and found compliant.

TOTAL ORGANIC CARBON (Method 415.1)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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 correlation and ICV were reviewed and found compliant.

IV. Blanks

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

V. MS/MSD

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

VI. LCS

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

VII. Duplicate

A. A field duplicate sample was not submitted for this SDG. LCS duplicate precision results met acceptance criteria.

VIII. Other

A. LOQ was reviewed and found compliant.

TOTAL SUSPENDED SOLIDS (Method 160.2)

I. Temperature

A. Shipping cooler temperature was measured at 2 °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. Blanks

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

IV. MS/MSD

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

V. LCS

A. The LCS results recovered within the acceptance limits.

VI. Duplicate

A. A field duplicate sample was not submitted for this SDG. LCS duplicate precision results exceeded the laboratory limit of 10 RPD at 13.6 RPD. Validation qualifiers were not assigned.

VII. Other

A. LOQ was reviewed and found compliant.

DATA QUALIFICATION SUMMARY

CCWS-62, Former STP Percolation Ditches, SDG L13110051, four field samples:
MPL28-1013-1, T40-1013-1, MPL17-1013-1, and MPL10-1013-1**.**

Metals – Data Qualification Summary

No sample data were qualified in this SDG.

Anions – Data Qualification Summary

No sample data were qualified in this SDG.

Cyanide – 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.

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 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.