Data Validation Summary Report
(DVSR ID: TetraTech-M041-2016rev2)
Groundwater Bioremediation Treatability Study
Nevada Environmental Response Trust Site
Henderson, Nevada

PREPARED FOR

Nevada Environmental Response Trust
35 E. Wacker Drive, Suite 1550
Chicago, IL 60601

PRESENTED BY

Tetra Tech, Inc.
150 S. Fourth Street, Unit A
Henderson, NV 89015

May 12, 2017

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

LIST OF ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CCB	continuing calibration blank
CCV	continuing calibration verification
COD	chemical oxygen demand
DQO	data quality objectives
DUP	duplicate
DVSR	data validation summary report
EB	equipment blank
FB	field blank
FD	field duplicate
IC	ion chromatography
ICB	initial calibration blank
ICV	initial calibration verification
LCS/LCSD	laboratory control sample / laboratory control sample duplicate
MDL	method detection limit
mg/L	milligram per liter
MS/MSD	matrix spike / matrix spike duplicate
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
NFG	National Functional Guidelines
%D	percent difference
%R	percent recovery
%RSD	percent relative standard deviation
PARCCS	precision, accuracy, representativeness, comparability, completeness, sensitivity
PQL	practical quantitation limit
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RL	reporting limit
RPD	relative percent difference
SDG	sample delivery group
SQL	sample quantitation limit
Tetra Tech	Tetra Tech, Inc.

Acronyms/Abbreviations	Definition
TDS	total dissolved solids
TOC	total organic carbon
TS	treatability study
USEPA	United States Environmental Protection Agency
µg/L	micrograms per liter

1.0 INTRODUCTION

On behalf of the Nevada Environmental Response Trust (NERT), Tetra Tech, Inc. (Tetra Tech) has prepared this Data Validation Summary Report (DVSR) to assess the validity and usability of laboratory analytical data from the Groundwater Bioremediation Treatability Study (TS) for the NERT site, located in Clark County, Nevada. Sampling protocol can be found in Groundwater Bioremediation Pilot Test Work Plan (Tetra Tech, 2015). Tetra Tech performed the TS which included the collection and analyses of 154 groundwater samples to assess the effectiveness of the TS. In addition to the groundwater samples, Tetra Tech collected eleven soil and five groundwater soils for informational purposes. Tetra Tech collected additional quality control (QC) samples used to aid in assessing data quality.

TestAmerica, Inc. (TA) provided laboratory analytical services. The analyses were performed by the methods shown in Table 1.

The lab assigned job numbers or sample delivery groups (SDGs) to all samples. The samples are associated with quality assurance and quality control (QA/QC) samples designed to document the data quality of the samples in each sampling round or within an SDG. Table 2 is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample number, matrix, and stage of validation. Laboratory data packages may be found in Appendix F.2.

The laboratory analytical data were verified and validated in accordance with procedures described in the Nevada Division of Environmental Protection (NDEP) *Data Verification and Validation Requirements - Supplement April, 2009* established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada and correspondence by NDEP personnel. Approximately ninety percent of the TS groundwater, equipment blank, and field blank laboratory analytical data (5088 results of the 5885 results) were validated to Stage 2B and at least ten percent of the analytical data (797 results of the 5885 results) were validated to Stage 4. Samples taken for information only (219 results) were validated to stage 2A. Matrix spike (MS) and matrix spike duplicate (MSD) results were evaluated to the same stage as their parent samples, but are not included in result counts. The analytical data were evaluated for QA/QC based on the following documents: *Quality Assurance Project Plan (QAPP),* Revision 1, July 18 2014; NDEP *Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas*, January 5 2012; *National Functional Guidelines for Inorganic Superfund Data Review, August 2014*; *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review, August 2014;* and the *EPA SW 846 Third Edition, Test Methods for Evaluating Solid Waste,* update I, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IV, February 2007. Data Verification and Validation Summary reports are compiled in Appendix F.1.

This report summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) relative to the project data quality objectives (DQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

2.0 PRECISION AND ACCURACY OF ENVIRONMENTAL DATA

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sampling procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which affect the overall quality of a measurement. Errors for sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC requirements. The sample matrix also is an important factor in the ability to obtain precise and accurate results within a given medium.

Environmental and laboratory QA/QC samples provide information on the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. Field QA/QC samples include equipment blanks (EBs), field blanks (FBs), field duplicates (FDs), and MS/MSDs. Laboratory QA/QC samples include method blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSDs), laboratory duplicates (DUP), and additional MS/MSDs needed to meet method requirements.

2.1 PRECISION

Precision is a measure of the agreement of analytical results under a given set of conditions. It is a quantity that is not measured directly but is calculated from concentrations. Precision can be expressed as the relative percent difference (RPD) between two measurements:

$$RPD = \frac{(C1 - C2)*100}{(C1 + C2)/2}$$

where:
C1 = reported concentration for the sample
C2 = reported concentration for the duplicate

Precision can be expressed as the percent relative standard deviation (%RSD) between three or more measurements:

$$\%RSD = (s/\bar{a})*100$$

where:
%RSD = percent relative standard deviation
s = standard deviation
$\bar{a}$ = mean of replicate analyses

Precision is assessed by calculating %RSD during initial calibrations and RPD from the percent recoveries of the spiked compounds for each sample in the MS/MSD pair. In the absence of an MS/MSD pair, a laboratory duplicate or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. An additional measure of sampling precision was obtained by collecting and analyzing field duplicate samples, which were compared using the RPD results as the evaluation criteria.

MS and MSD samples are field samples spiked by the laboratory with target analytes prior to preparation and analysis. These samples measure the appropriateness of the analytical method and effectiveness in recovering target analytes from a particular environmental matrix. The LCS sample is spiked with the same target analytes as the MS/MSD using and interference-free matrix instead of a field sample aliquot. The LCS measures laboratory efficiency in recovering target analytes in the absence of matrix interferences. It is used to verify that the analyses are being performed in control.

The laboratory analyzes laboratory replicates. A field sample is analyzed and an unspiked duplicate of that sample is analyzed also. The data reviewer compares the reported results of the primary analysis and the laboratory duplicate and calculates RPDs to assess laboratory precision.

Calibration precision is determined by calculating %RSD. Laboratory and field sampling precision are evaluated by calculating RPDs for field sample duplicate pairs. The sampler collects two field samples at the same location and under identical conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the allowed limit between MS/MSD samples or LCS/LCSD indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. The actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample matrix interference, improper sample collection or handling, inconsistent sample preparation, instrument column fouling, and poor instrument stability. In duplicate pairs, results may be reported in either the primary or duplicate samples at levels below the practical quantitation limit (PQL) or non-detected. Since these values are estimated, RPD exceedances from these duplicate pairs do not suggest a significant impact to data quality.

2.2 ACCURACY

Accuracy is a measure of the closeness of agreement between a measured value and the true value of an analytical parameter. It may be used to identify bias in a given measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of continuing calibrations, MS, MSD, LCS, and LCSD. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Accuracy is determined using the percent recovery of MS and LCS analyses.

Percent recovery (%R) is calculated using the following equation:

$$\%R = (A-B)/C \times 100$$

where:
A = measured concentration in the spiked sample
B = measured concentration of the spike compound in the unspiked sample
C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples and LCS/LCSD was evaluated with the acceptance criteria specified by the QAPP and laboratory limits. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or quantitation limits reported for environmental samples.

2.3 REPRESENTATIVENESS

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population. It is evaluated by reviewing the QC results of blanks, samples and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, calibration blanks, EBs, and FBs.

A method blank is a laboratory grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

Several methods require the use of initial calibration blanks (ICBs) and continuing calibration blanks (CCBs). ICBs and CCBs are laboratory grade water that are analyzed at the beginning, during and at the end of sample analysis runs. The frequency is dependent on the analytical method. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

Equipment blanks consist of analyte-free water poured over or through the sample collection equipment. The water is collected in a sample container for laboratory analysis. These blanks are collected after the sampling equipment is decontaminated and measure efficiency of the decontamination procedure. Equipment blanks were collected and analyzed for all target analytes.

Field blanks consist of analyte-free source water stored at the sample collection site. The water is collected from each source water used during each sampling event. Field blanks were collected and analyzed for all target analytes.

Contaminants found in both the environmental sample and the blank sample are assumed to be laboratory artifacts if both values are less than the PQL or if a sample result and blank contaminant value were greater than the PQL and less than 10 times the blank contaminant value. The blanks and associated samples were evaluated according to the NDEP *BMI Plant Sites and Common Areas Projects, Henderson, Nevada, Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas*, January 5 2012.

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times are specific for each method and matrix analyzed. Holding time exceedance can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation. Sample results for analyses that were performed after the method holding time but less than two times the method holding time were qualified as estimated.

2.4 COMPARABILITY

Comparability is a qualitative characteristic that defines the extent to which the data for a chemical parameter measurement are consistent with, and may be compared with, data from other sampling events. Comparability is dependent upon the design of the sampling plans and execution of activities consistent with approved plans. Factors affecting comparability include sample collection and handling techniques, matrix type, and analytical method. Comparability is achieved through the use of standard techniques to collect representative samples, consistent application of analytical method protocols, and reporting analytical results with appropriate units. Comparability is also dependent upon other PARCCS criteria, because only when precision, accuracy, and representativeness are known can data sets be compared with confidence.

2.5 COMPLETENESS

Completeness is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of useable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the project DQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness is calculated using the following equation:

$$\%C = (T - R)/T \times 100$$

where:
%C = percent completeness

T = total number of sample results
R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the QAPP, with the number determined above.

2.6 SENSITIVITY

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. It is generally used to describe the instrument detection limits (DLs) or PQLs established to meet project DQOs. The method detection limits (MDLs) represent the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. Sample quantitation limits (SQLs) are adjusted MDL values that reflect sample specific actions, such as dilutions or varying aliquot sizes. The laboratory data reports show MDL in place of the SQL. It was adjusted to reflect the sample analysis conditions. The PQL is the minimum concentration that can be reported based on the analysis of a specific matrix. It is the often the lowest acceptable calibration point for the analyte. The laboratory data reports show reporting limit (RL) in place of the PQL. The laboratory reported detected analytes down to the adjusted MDL for this project. All results reported between the MDL and RL were qualified “J” by the laboratory. Sample results are compared to method and field blank results to identify possible effects of laboratory background and field procedures on sensitivity.

3.0 VALIDATION RESULTS AND PARCCS

This section discusses the validation results and the associated PARCCS criteria. Before conducting the PARCCS evaluation, the analytical data were validated according to the QAPP (May 2014), Functional Guidelines (USEPA 2014), and EPA analytical methods. Table 3 shows the matrix, method, parameters, and number of samples validated.

Samples not meeting the acceptance criteria were denoted with a validation qualifier that indicates a deficiency with the data. Table 4 contains validation qualifiers used in data validation.

When more than one validation qualifier was applicable to a data point, the final validation qualifier applied was based on a hierarchy.

The hierarchy of validation qualifiers is listed below:

R > J	R takes precedence over the J qualifier.
J+	The high bias (J+) qualifier is applied to detected results only.
J > J+ or J-	The unbiased (J) qualifier supersedes biased (J+ or J-) qualifiers since it is not possible to assess the direction of the potential bias.
J = J+ plus J-	Adding biased (J+, J-) qualifiers with opposite signs will result in an unbiased qualifier (J).
UJ = U plus J	The UJ qualifier is used when a non-detected (U) flag is added to a (J) flag.

Table 5 identifies the QC elements reviewed for each validation level. The actual elements are method-dependent.

Table 6 lists the reason codes used. Reason codes explain why data were qualified and identify possible limitations of data use. Reason codes are cumulative except when one of the flags is R. Only the reason code associated with the R flag will be used.

Table 7 presents the overall qualified results after the validation qualifiers and associated reason codes were applied.

3.1 PRECISION

3.1.1 Instrument Calibration

The objective of initial calibration is to ensure that an instrument is capable of producing acceptable qualitative and quantitative data by determining the ratio of instrument response to analyte concentration. %RSD is used to evaluate initial calibration results and provide a means of evaluating precision within an analytical system. All %RSDs were acceptable. No data were qualified for imprecision in the initial calibration.

3.1.2 MS/MSD Samples

MS/MSD RPDs outside of acceptance criteria as stated in the QAPP are shown in Table 8.

The following analytes were qualified "J" for imprecision: calcium and iron in soil BP-MW08-B; nitrate in groundwater BP-MW08-EM02, selenium in groundwater BP-MW07-EM10, and phosphorus in groundwater BP-MW07-EM11. Lactic acid was not detected in BP-MW08-EM08, so the value cannot be imprecise. Since the

inorganic NFG does not offer guidance for MS/MSD RPDs, the organic NFG was used. The organic NFG does not require qualification of non-detected results for RPD outliers.

3.1.3 LCS/LCSD Samples

All LCS/LCSD RPDs met acceptance criteria as stated in the QAPP.

3.1.4 FD Samples

For results > 5X the PQL, the field duplicate samples were evaluated for acceptable precision with RPDs. For results < 5X the PQL, samples were evaluated by the difference between the two measurements. Table 9 includes results where RPDs exceeded 30% or the difference between the values was greater than the absolute value of the PQL. Fourteen field sample and field duplicate pairs were analyzed. RPDs and differences were determined for 436 pairs of results in all analytical methods. . In the cases shown in Table 9, the parent sample and the FD were qualified “J” for detects and “UJ” for non-detects.

3.2 ACCURACY

3.2.1 Instrument Calibration

The objective of continuing calibration is to ensure that the instrument continues to meet the sensitivity and linearity criteria throughout each analytical sequence. Initial and continuing calibration verification (CCV) results provide a means of evaluating accuracy within a particular SDG. Percent difference or drift (%D), percent recovery (%R), correlation coefficient (r), and coefficient of determination (r2) are the parameters used to measure the effectiveness of instrument calibration. The correlation coefficient indicates the linearity of the calibration curve. %R and %D are used to verify the ongoing calibration acceptability of the analytical system.

Most calibration criteria were met. The criteria shown in Table 10 were outside acceptable limits, biased high. All the results were non-detect. Per guidance found in the inorganic NFG, no qualification was applied.

3.2.2 MS/MSD Samples

Many MS/MSD %Rs were outside of acceptance criteria shown in the QAPP. MS/MSD %R exceedances can be found in Table 11. Analytes that were present in the parent sample in concentrations greater than 4 times the amount spiked were not qualified and are not shown in the table. In cases where the recoveries were high and the parent sample was non-detect, no qualification was applied. In accordance with the inorganic NFG, qualifiers were applied to similar samples in the SDGs. Similarity was determined by comparing field readings and laboratory results of the samples. Per the inorganic NFG, MS/MSD recoveries < 30% resulted in rejection of the data point.. In cases where dilutions caused the low recoveries, the data were not rejected or qualified. Chlorite analysis of BP-MW07-EM07 was analyzed at 50x dilution and was not qualified for MS/MSD recoveries. Seven results were rejected because of low recoveries. 77 other results were qualified for MS/MSD %Rs. Results qualified for MS/MSD recoveries can be found in Table 7 with reason code “m”.

3.2.3 LCS/LCSD Samples

All LCS/LCSD %Rs except one met acceptance criteria as stated in the QAPP. In SDG 440-122317-1, LCS recovery of pyruvic acid was 122%. The acceptable range is 80-120%. Pyruvic acid was not detected in the associated samples, so no qualification was applied.

3.2.4 Serial Dilutions

The serial dilution is used to determine whether physical or chemical interferences exist due to matrix. Most serial dilution %Ds were less than 10% as required in the inorganic NFG. Arsenic in sample BP-MW05-EM09 was qualified "J", estimated.

3.2.5 Interference Check Samples

Interference check samples were analyzed in the following methods: 314.0, 6010B, and 6020. All interference check %Rs met acceptance criteria of 80%-120%.

3.2.6 Surrogates

Surrogates were analyzed in chlorate/chlorite analysis by EPA Method 300.1B. All surrogate %Rs met the acceptance criteria as stated in the QAPP.

3.2.7 Internal Standards

The objective of internal standard analysis is to determine the existence and magnitude of instrument drift and physical interferences. The percent relative intensity of Bi-209 was less than 60% as required in the inorganic NFG. Thallium results in samples BP-MW03-EM06 and BP-MW08-EM06 were qualified "UJ" in accordance with the NFG.

3.2.8 Analyte Quantitation and Target Identification

Raw data were evaluated for the Stage 4 samples. All analyte quantitation and target identifications reviewed matched the reported values. Tungsten was qualified "UJ" in several samples because recovery in the associated quantitation limit check sample was below 50%. The reported quantitation limits may be inaccurate or imprecise.

3.3 REPRESENTATIVENESS

3.3.1 Sample Preservation and Holding Times

Holding times and sample preservation were evaluated to verify compliance with the analytical method. Most samples met the preservation and holding time criteria shown in Table 7 of the QAPP. Sixteen results were qualified for holding time infractions, designated with reason code "h" in Table 7. The exceedances are shown in Table 12.

Six results were rejected and thirteen results were qualified for improper preservation, designated with reason code "pH" in Table 7. The preservation infractions are shown in Table 13. The following results were rejected in accordance with the inorganic NFG: chemical oxygen demand in BP-MW03-EM06, chlorite in MW-K5-EMBL, total phosphorus in FIELD QC EM04-EB and FIELD QC-EM04-FB, and total nitrogen in FIELD QC EM04-EB and FIELD QC-EM04-FB.

3.3.2 Blanks

Method blanks, ICBs, CCBs, EBs, and FBs were analyzed to evaluate representativeness. The concentration of an analyte in any blank was used for data qualification. If contaminants were detected in a blank, the blank concentration was compared to the sample results. If the analyte was not detected in the sample, no qualification was applied to the sample. If the sample concentration was greater than 10 times the amount in the blank, no qualification was applied.

For concentrations detected in the sample below the PQL, the sample result was qualified "J". Based on hierarchy of validation qualification, the "J" qualifier, in this case applied to detected results below the PQL, supersedes the positive bias associated with blank contamination.
For concentrations detected in the sample above the PQL, the sample result was qualified "J+".

3.3.2.1 Method and Calibration Blanks

Several contaminants were detected in the method and calibration blanks. In most cases the analyte was not detected in the sample or the concentration in the sample was greater 10x the amount in the blank. In those cases, no qualification was applied. ICB and CCB detections are shown in Table 14. Metals were detected in 14 method blanks. Detections in method blanks are in shown Table 15. Qualified results are shown in Table 7 with reason code "bl".

3.3.2.2 EBs and FBs

There were 52 detections in the EBs and 21 detections in FBs. Analytes were detected in the following methods: EPA 300, EPA 314.0, EPA 351.2, EPA 365.3, RSK175, SM2540C, SW6010B, and VFA-IC. EB and FB detections are shown in Table 16. Fifty-one results were qualified because of EB detections. Twenty-nine results were qualified because of FB detections. Qualified results are shown in Table 7 with reason codes "be" and "bf".

3.4 COMPARABILITY

The laboratory used standard analytical methods for all of the analyses. In all cases, the adjusted MDLs attained were at or below the PQLs. Target compounds detected below the PQLs were flagged "J" by the laboratory and should be considered estimated. The comparability of the data is acceptable.

3.5 COMPLETENESS

The completeness level attained for the field samples, field blanks, and equipment blanks was 99.8 percent. Out of 6104 validated results, 13 were rejected. The percentage was calculated as the total number of accepted (non-rejected) sample results divided by the total number of sample results multiplied by 100.

3.6 SENSITIVITY

The calibrations were evaluated for instrument sensitivity and were determined to be technically acceptable. Due to high levels of analyte concentrations, many analytical runs were analyzed at dilutions. MDLs and PQLs were elevated.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical data quality assessment for the soil and water laboratory analytical results generated during the TS at the NERT site in Henderson, Nevada established that the overall project requirements and completeness levels were met. Most sample results were found to be useable. Thirteen results were rejected for either matrix effects or preservation infractions. Sample results that were qualified as estimated are useable for limited purposes only.

5.0 REFERENCES

American Public Health Association. (1998 and Updates). *Standard Methods for the Examination of Water and Wastewater.*

ENVIRON. (2014c). Quality Assurance Project Plan, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada.

NDEP. (2009). Data Verification and Validation Requirements – Supplement April 2009.

NDEP. (2012). Revised Guidance on Qualifying Data Due to Blank Contamination for the BMI Complex and Common Areas.

Tetra Tech. (2015). Groundwater Bioremediation Pilot Test Work Plan.

USEPA. (1983). EPA Methods for Chemical Analysis of Water and Wastes. (EPA-600/4-79-020). Cincinnati, Ohio.

USEPA. (1996). Test Methods for Evaluating Solid Waste. (SW-846). (3rd Edition). Update I, July 1992; Update IIA, August 1993; Update II, September 1994; Update IIB, January 1995; Update III, December 1996; Update IV; February 2007.

USEPA. (2009). Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. (EPA-540/R-08-005).

USEPA. (2014a). National Functional Guidelines for Inorganic Superfund Data Review.

USEPA. (2014b). National Functional Guidelines for Superfund Organic Methods Data Review.

Tables

Table 1 Analytical Methods

Method	Parameters
EPA 300.0	Bromide, Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate
EPA 300.1B	Chlorate and Chlorite
EPA 314.0	Perchlorate
EPA 351.2	Total Kjeldahl Nitrogen
EPA 365.3	Phosphorus
EPA SW-846 6010B	Dissolved Metals*
EPA SW-846 6010B	Total Iron and Manganese
EPA SW-846 6020	Dissolved Metals (Antimony, Arsenic, Selenium, Thallium)
EPA SW-846 7199	Chromium, hexavalent
EPA SW-846 9045	pH
EPA SW-846 9060	Total Organic Carbon (TOC)
NTOTAL-CALC	Nitrogen, Total - calculated
RSK175	Methane
SM2320B	Alkalinity, Bicarbonate, Carbonate, and Hydroxide
SM2340C	Hardness as calcium carbonate
SM2540C	Total Dissolved Solids (TDS)
SM5220D	Chemical Oxygen Demand (COD)
SM5310B	TOC
VFA by Ion Chromatography (IC)	Volatile Fatty Acids

Notes:

Dissolved metals include aluminum, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, silicon, silver, sodium, strontium, tin, titanium, tungsten, vanadium, zinc.

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-107257-1/2	BHW-1-201504	440-107257-1	Water	4/14/2015	NORM	Stage 2A							
440-107257-1/2	MW-K5-201504	440-107257-2	Water	4/15/2015	NORM	Stage 2A		X	X	X		X	X
440-107257-1/2	MW-K5-201504MS	440-107257-2	Water	4/15/2015	MS	Stage 2A				X			
440-107257-1/2	MW-K5-201504SD	440-107257-2	Water	4/15/2015	MSD	Stage 2A				X			
440-107289-1	BHW-1-0-201504	440-107289-1	Solid	4/14/2015	NORM	Stage 2A		X		X			
440-107289-1	BHW-1-0-201504MS	440-107289-1	Solid	4/14/2015	MS	Stage 2A		X		X			
440-107289-1	BHW-1-0-201504SD	440-107289-1	Solid	4/14/2015	MSD	Stage 2A		X		X			
440-107289-1	BHW-1-0-201504-FD	440-107289-2	Solid	4/14/2015	FD	Stage 2A				X			
440-108121-1	BHW-1-20150427	440-108121-1	Water	4/27/2015	NORM	Stage 2A		X	X	X		X	X
440-108121-1	BHW-1-20150427MS	440-108121-1	Water	4/27/2015	MS	Stage 2A		X					
440-108121-1	BHW-1-20150427SD	440-108121-1	Water	4/27/2015	MSD	Stage 2A		X					
440-108121-1	PC-98R-20150427	440-108121-2	Water	4/27/2015	NORM	Stage 2A		X	X	X		X	X
440-108121-1	PC-98R-20150427MS	440-108121-2	Water	4/27/2015	MS	Stage 2A							
440-108121-1	PC-98R-20150427SD	440-108121-2	Water	4/27/2015	MSD	Stage 2A							
440-108121-1	PC-98R-20150427-FD	440-108121-3	Water	4/27/2015	FD	Stage 2A				X			
440-108121-1	FIELDQC-20150427-EB	440-108121-4	Water	4/27/2015	EB	Stage 2A				X			
440-108121-1	FIELDQC-20150427-FB	440-108121-5	Water	4/27/2015	FB	Stage 2A				X			
440-119195-1	BP-MW05-A	440-119195-1	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW05-B	440-119195-2	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-A	440-119195-3	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-B	440-119195-4	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-BMS	440-119195-4	Solid	8/24/2015	MS	Stage 2A							
440-119195-1	BP-MW08-BSD	440-119195-4	Solid	8/24/2015	MSD	Stage 2A							
440-119195-1	BP-MW08-C	440-119195-5	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-A	440-119195-6	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-B	440-119195-7	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-B-FD	440-119195-8	Solid	8/25/2015	FD	Stage 2A							
440-119195-1	BP-IW02-C	440-119195-9	Solid	8/25/2015	NORM	Stage 2A							
440-122031-1	BP-MW08-EMBL	440-122031-1	Water	9/21/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122031-1	BP-MW08-EMBLMS	440-122031-1	Water	9/21/2015	MS	Stage 2B							
440-122031-1	BP-MW08-EMBLSD	440-122031-1	Water	9/21/2015	MSD	Stage 2B							
440-122031-1	BP-MW02-EMBL	440-122031-2	Water	9/21/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122031-1	BP-MW02-EMBLMS	440-122031-2	Water	9/21/2015	MS	Stage 2B							
440-122171-1	BH-1-EMBL	440-122171-1	Water	9/22/2015	NORM	Stage 2B		X	X	X			
440-122171-1	BH-1-EMBLMS	440-122171-1	Water	9/22/2015	MS	Stage 2B		X					
440-122171-1	BH-1-EMBLSD	440-122171-1	Water	9/22/2015	MSD	Stage 2B		X					
440-122171-1	BP-MW05-EMBL	440-122171-2	Water	9/22/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122171-1	BP-MW05-EMBL-FD	440-122171-3	Water	9/22/2015	FD	Stage 2B		X	X	X	X	X	X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-122171-1	BP-MW01-EMBL	440-122171-4	Water	9/22/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122171-1	BP-MW01-EMBLMS	440-122171-4	Water	9/22/2015	MS	Stage 2B							
440-122171-1	BP-MW01-EMBLSD	440-122171-4	Water	9/22/2015	MSD	Stage 2B							
440-122171-1	MW-K5-EMBL	440-122171-5	Water	9/22/2015	NORM	Stage 2B		X	X	X			
440-122171-1	MW-K5-EMBLMS	440-122171-5	Water	9/22/2015	MS	Stage 2B		X					
440-122171-1	MW-K5-EMBLSD	440-122171-5	Water	9/22/2015	MSD	Stage 2B		X					
440-122171-1	FIELD QC-EMBL-EB	440-122171-6	Water	9/22/2015	EB	Stage 2B		X	X	X	X	X	X
440-122171-1	FIELD QC-EMBL-EBMS	440-122171-6	Water	9/22/2015	MS	Stage 2B					X		
440-122171-1	FIELD QC-EMBL-EBSD	440-122171-6	Water	9/22/2015	MSD	Stage 2B					X		
440-122317-1	BP-MW06-EMBL	440-122317-1	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-MW06-EMBLMS	440-122317-1	Water	9/23/2015	MS	Stage 2B		X					
440-122317-1	BP-MW06-EMBLSD	440-122317-1	Water	9/23/2015	MSD	Stage 2B		X					
440-122317-1	BP-IW01-EMBL	440-122317-2	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-MW07-EMBL	440-122317-3	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-IW02-EMBL	440-122317-4	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-MW09-EMBL	440-122317-5	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-IW03-EMBL	440-122317-6	Water	9/23/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122317-1	BP-IW03-EMBLMS	440-122317-6	Water	9/23/2015	MS	Stage 2B							
440-122317-1	FIELDQC-EMBL-FB	440-122317-7	Water	9/23/2015	FB	Stage 2B		X	X	X	X	X	X
440-122317-1	FIELDQC-EMBL-FBMS	440-122317-7	Water	9/23/2015	MS	Stage 2B							
440-122317-1	FIELDQC-EMBL-FBSD	440-122317-7	Water	9/23/2015	MSD	Stage 2B							
440-122387-1	BP-MW04-EMBL	440-122387-1	Water	9/24/2015	NORM	Stage 2B		X	X	X	X	X	X
440-122387-1	BP-MW04-EMBLMS	440-122387-1MS	Water	9/24/2015	MS	Stage 2B		X	X	X	X	X	
440-122387-1	BP-MW04-EMBLSD	440-122387-1MSD	Water	9/24/2015	MSD	Stage 2B		X	X	X	X	X	
440-122387-1	BP-MW04-EMBL	440-122387-2	Water	9/24/2015	NORM	Stage 2B							
440-122387-1	BP-MW04-EMBLMS	440-122387-2	Water	9/24/2015	MS	Stage 2B							
440-122387-1	BP-MW04-EMBLSD	440-122387-2	Water	9/24/2015	MSD	Stage 2B							
440-122387-1	BP-MW03-EMBL	440-122387-3	Water	9/24/2015	NORM	Stage 2B		X	X	X	X	X	X
440-130250-1/2	BP-MW01-EM01	440-130250-1	Water	12/8/2015	NORM	Stage 2B	X	X	X	X			
440-130250-1/2	BP-MW05-EM01	440-130250-2	Water	12/8/2015	NORM	Stage 2B	X	X	X	X			
440-130250-1/2	BP-MW05-EM01MS	440-130250-2	Water	12/8/2015	MS	Stage 2B		X	X	X			
440-130250-1/2	BP-MW05-EM01SD	440-130250-2	Water	12/8/2015	MSD	Stage 2B		X	X	X			
440-130250-1/2	BP-MW05-EM01-FD	440-130250-3	Water	12/8/2015	FD	Stage 2B	X	X	X	X			
440-130250-1/2	BP-MW03-EM01	440-130250-4	Water	12/8/2015	NORM	Stage 2B	X	X	X	X			
440-130250-1/2	BP-MW07-EM01	440-130250-5	Water	12/8/2015	NORM	Stage 2B	X	X	X	X			
440-130250-1/2	BP-MW09-EM01	440-130250-6	Water	12/8/2015	NORM	Stage 2B	X	X	X	X			
440-131167-1/2	FIELDQC-EM02-FB	440-131167-1	Water	12/15/2015	FB	Stage 2B		X	X	X	X	X	X
440-131167-1/2	FIELDQC-EM02-FBMS	440-131167-1	Water	12/15/2015	MS	Stage 2B					X		

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-131167-1/2	FIELDQC-EM02-FBSD	440-131167-1	Water	12/15/2015	MSD	Stage 2B					X		
440-131167-1/2	FIELDQC-EM02-EB	440-131167-2	Water	12/15/2015	EB	Stage 2B		X	X	X	X	X	X
440-131167-1/2	BP-MW06-EM02	440-131167-3	Water	12/15/2015	NORM	Stage 2B		X		X			
440-131167-1/2	BP-MW06-EM02MS	440-131167-3	Water	12/15/2015	MS	Stage 2B							
440-131167-1/2	BP-MW06-EM02SD	440-131167-3	Water	12/15/2015	MSD	Stage 2B							
440-131167-1/2	BP-MW09-EM02	440-131167-4	Water	12/15/2015	NORM	Stage 2B		X	X	X	X	X	X
440-131337-1/2	BP-MW07-EM02	440-131337-1	Water	12/16/2015	NORM	Stage 2B		X	X	X	X	X	X
440-131337-1/2	BP-MW07-EM02MS	440-131337-1	Water	12/16/2015	MS	Stage 2B		X	X	X	X	X	
440-131337-1/2	BP-MW07-EM02SD	440-131337-1	Water	12/16/2015	MSD	Stage 2B		X	X	X	X	X	
440-131337-1/2	BP-MW05-EM02	440-131337-2	Water	12/16/2015	NORM	Stage 2B		X	X	X	X	X	X
440-131337-1/2	BP-MW03-EM02	440-131337-3	Water	12/16/2015	NORM	Stage 2B		X	X	X	X	X	X
440-131337-1/2	BP-MW01-EM02	440-131337-4	Water	12/16/2015	NORM	Stage 2B		X	X	X	X	X	X
440-131433-1	BP-MW04-EM02	440-131433-1	Water	12/17/2015	NORM	Stage 2B		X		X			
440-131433-1	BP-MW04-EM02MS	440-131433-1	Water	12/17/2015	MS	Stage 2B							
440-131433-1	BP-MW04-EM02SD	440-131433-1	Water	12/17/2015	MSD	Stage 2B							
440-131433-1	BP-MW02-EM02	440-131433-2	Water	12/17/2015	NORM	Stage 2B		X		X			
440-131433-1	BP-MW08-EM02	440-131433-3	Water	12/17/2015	NORM	Stage 2B		X		X			
440-131433-1	BP-MW08-EM02MS	440-131433-3	Water	12/17/2015	MS	Stage 2B		X					
440-131433-1	BP-MW08-EM02SD	440-131433-3	Water	12/17/2015	MSD	Stage 2B		X					
440-131796-1	BP-MW01-EM03	440-131796-1	Water	12/21/2015	NORM	Stage 2B		X	X	X			
440-131796-1	BP-MW02-EM03	440-131796-2	Water	12/21/2015	NORM	Stage 2B		X		X			
440-131796-1	BP-MW03-EM03	440-131796-3	Water	12/21/2015	NORM	Stage 2B		X	X	X			
440-131796-1	BP-MW05-EM03	440-131796-4	Water	12/21/2015	NORM	Stage 2B		X	X	X			
440-131796-1	BP-MW05-EM03MS	440-131796-4	Water	12/21/2015	MS	Stage 2B		X	X	X			
440-131796-1	BP-MW05-EM03SD	440-131796-4	Water	12/21/2015	MSD	Stage 2B		X	X	X			
440-131796-1	BP-MW05-EM03-FD	440-131796-5	Water	12/21/2015	FD	Stage 2B		X	X	X			
440-131796-1	BP-MW07-EM03	440-131796-6	Water	12/21/2015	NORM	Stage 2B		X	X	X			
440-131796-1	BP-MW09-EM03	440-131796-7	Water	12/21/2015	NORM	Stage 2B		X	X	X			
440-131951-1	BP-MW04-EM03	440-131951-1	Water	12/22/2015	NORM	Stage 2B		X		X			
440-131951-1	BP-MW06-EM03	440-131951-2	Water	12/22/2015	NORM	Stage 2B		X		X			
440-131951-1	BP-MW08-EM03	440-131951-3	Water	12/22/2015	NORM	Stage 2B		X		X			
440-131951-1	BP-MW08-EM03MS	440-131951-3	Water	12/22/2015	MS	Stage 2B		X					
440-131951-1	BP-MW08-EM03SD	440-131951-3	Water	12/22/2015	MSD	Stage 2B		X					
440-132568-1/2	BP-MW01-EM04	440-132568-1	Water	12/29/2015	NORM	Stage 2B		X	X	X	X	X	X
440-132568-1/2	BP-MW05-EM04	440-132568-2	Water	12/29/2015	NORM	Stage 2B		X	X	X	X	X	X
440-132568-1/2	BP-MW07-EM04	440-132568-3	Water	12/29/2015	NORM	Stage 2B		X	X	X	X	X	X
440-132568-1/2	BP-MW07-EM04MS	440-132568-3	Water	12/29/2015	MS	Stage 2B		X	X	X	X	X	
440-132568-1/2	BP-MW07-EM04SD	440-132568-3	Water	12/29/2015	MSD	Stage 2B		X	X	X	X	X	

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-132568-1/2	BP-MW03-EM04	440-132568-4	Water	12/29/2015	NORM	Stage 2B		X	X	X	X	X	X
440-132568-1/2	BP-MW03-EM04MS	440-132568-4	Water	12/29/2015	MS	Stage 2B							
440-132568-1/2	BP-MW03-EM04SD	440-132568-4	Water	12/29/2015	MSD	Stage 2B							
440-132568-1/2	FIELD QC-EM04-EB	440-132568-5	Water	12/29/2015	EB	Stage 2B		X	X	X	X	X	X
440-132568-1/2	FIELD QC EM04-FB	440-132568-6	Water	12/29/2015	FB	Stage 2B		X	X	X	X	X	X
440-132568-1/2	BP-MW09-EM04	440-132568-7	Water	12/29/2015	NORM	Stage 2B		X	X	X	X	X	X
440-132679-1	BP-MW08-EM04	440-132679-1	Water	12/30/2015	NORM	Stage 2B		X		X			
440-132679-1	BP-MW06-EM04	440-132679-2	Water	12/30/2015	NORM	Stage 2B		X		X			
440-132679-1	BP-MW06-EM04MS	440-132679-2	Water	12/30/2015	MS	Stage 2B							
440-132679-1	BP-MW06-EM04SD	440-132679-2	Water	12/30/2015	MSD	Stage 2B							
440-132679-1	BP-MW02-EM04	440-132679-3	Water	12/30/2015	NORM	Stage 2B		X		X			
440-132679-1	BP-MW04-EM04	440-132679-4	Water	12/30/2015	NORM	Stage 2B		X		X			
440-132679-1	BP-MW04-EM04MS	440-132679-4	Water	12/30/2015	MS	Stage 2B		X					
440-132679-1	BP-MW04-EM04SD	440-132679-4	Water	12/30/2015	MSD	Stage 2B		X					
440-134828-1/2	BP-MW07-EM05	440-134828-1	Water	1/12/2016	NORM	Stage 2B		X	X	X			
440-134828-1/2	BP-MW07-EM05MS	440-134828-1	Water	1/12/2016	MS	Stage 2B		X	X	X			
440-134828-1/2	BP-MW07-EM05SD	440-134828-1	Water	1/12/2016	MSD	Stage 2B		X	X	X			
440-134828-1/2	BP-MW06-EM05	440-134828-2	Water	1/12/2016	NORM	Stage 2B		X	X	X			
440-134828-1/2	BP-MW07-EM05-FD	440-134828-3	Water	1/12/2016	FD	Stage 2B		X	X	X			
440-135045-1/2	BP-MW03-EM05	440-135045-1	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW03-EM05MS	440-135045-1	Water	1/13/2016	MS	Stage 2B			X				
440-135045-1/2	BP-MW03-EM05SD	440-135045-1	Water	1/13/2016	MSD	Stage 2B			X				
440-135045-1/2	BP-MW08-EM05	440-135045-2	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW05-EM05	440-135045-3	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW09-EM05	440-135045-4	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW09-EM05MS	440-135045-4	Water	1/13/2016	MS	Stage 2B		X					
440-135045-1/2	BP-MW09-EM05SD	440-135045-4	Water	1/13/2016	MSD	Stage 2B		X					
440-135045-1/2	BP-MW01-EM05	440-135045-5	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW02-EM05	440-135045-6	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135045-1/2	BP-MW04-EM05	440-135045-7	Water	1/13/2016	NORM	Stage 2B		X	X	X			
440-135159-1/2	BH-01-EM05	440-135159-1	Water	1/14/2016	NORM	Stage 2B		X	X	X			
440-135159-1/2	BH-01-EM05MS	440-135159-1	Water	1/14/2016	MS	Stage 2B			X				
440-135159-1/2	BH-01-EM05SD	440-135159-1	Water	1/14/2016	MSD	Stage 2B			X				
440-135159-1/2	MW-K5-EM05	440-135159-2	Water	1/14/2016	NORM	Stage 2B		X	X	X			
440-135159-1/2	MW-K5-EM05MS	440-135159-2	Water	1/14/2016	MS	Stage 2B		X					
440-135159-1/2	MW-K5-EM05SD	440-135159-2	Water	1/14/2016	MSD	Stage 2B		X					
440-136058-1/2	FIELDQC-EM06-FB	440-136058-1	Water	1/25/2016	FB	Stage 2B		X	X	X	X	X	X
440-136058-1/2	FIELDQC-EM06-FBMS	440-136058-1	Water	1/25/2016	MS	Stage 2B					X		

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-136058-1/2	FIELDQC-EM06-FBSD	440-136058-1	Water	1/25/2016	MSD	Stage 2B					X		
440-136058-1/2	FIELDQC-EM06-EB	440-136058-2	Water	1/25/2016	EB	Stage 2B		X	X	X	X	X	X
440-136058-1/2	FIELDQC-EM06-EBMS	440-136058-2	Water	1/25/2016	MS	Stage 2B							
440-136058-1/2	FIELDQC-EM06-EBSD	440-136058-2	Water	1/25/2016	MSD	Stage 2B							
440-136168-1/2	BP-MW09-EM06	440-136168-1	Water	1/26/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136168-1/2	BP-MW09-EM06MS	440-136168-1	Water	1/26/2016	MS	Stage 2B						X	
440-136168-1/2	BP-MW09-EM06SD	440-136168-1	Water	1/26/2016	MSD	Stage 2B						X	
440-136168-1/2	BP-MW07-EM06	440-136168-2	Water	1/26/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136168-1/2	BP-MW07-EM06MS	440-136168-2	Water	1/26/2016	MS	Stage 2B		X	X	X	X	X	
440-136168-1/2	BP-MW07-EM06SD	440-136168-2	Water	1/26/2016	MSD	Stage 2B		X	X	X	X	X	
440-136168-1/2	BP-MW05-EM06	440-136168-3	Water	1/26/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136168-1/2	BP-MW06-EM06	440-136168-4	Water	1/26/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136168-1/2	BP-MW06-EM06MS	440-136168-4	Water	1/26/2016	MS	Stage 2B						X	
440-136168-1/2	BP-MW06-EM06SD	440-136168-4	Water	1/26/2016	MSD	Stage 2B						X	
440-136168-1/2	BP-MW02-EM06	440-136168-5	Water	1/26/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136168-1/2	BP-MW02-EM06-FD	440-136168-6	Water	1/26/2016	FD	Stage 2B		X	X	X	X	X	X
440-136337-1/2	BP-IW01-EM06	440-136337-1	Water	1/27/2016	NORM	Stage 2B		X		X			
440-136337-1/2	BP-MW01-EM06	440-136337-2	Water	1/27/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136337-1/2	BP-MW01-EM06MS	440-136337-2	Water	1/27/2016	MS	Stage 2B						X	
440-136337-1/2	BP-MW01-EM06SD	440-136337-2	Water	1/27/2016	MSD	Stage 2B						X	
440-136337-1/2	BP-MW03-EM06	440-136337-3	Water	1/27/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136337-1/2	BP-MW08-EM06	440-136337-4	Water	1/27/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136337-1/2	BP-MW08-EM06MS	440-136337-4	Water	1/27/2016	MS	Stage 2B		X					
440-136337-1/2	BP-MW08-EM06SD	440-136337-4	Water	1/27/2016	MSD	Stage 2B		X					
440-136337-1/2	BP-MW04-EM06	440-136337-5	Water	1/27/2016	NORM	Stage 2B		X	X	X	X	X	X
440-136337-1/2	BP-MW04-EM06MS	440-136337-5	Water	1/27/2016	MS	Stage 2B							
440-136337-1/2	BP-MW04-EM06SD	440-136337-5	Water	1/27/2016	MSD	Stage 2B							
440-136337-1/2	BP-IW03-EM06	440-136337-6	Water	1/27/2016	NORM	Stage 2B		X		X			
440-136507-1/2	BP-IW02-EM06	440-136507-1	Water	1/28/2016	NORM	Stage 2B		X		X			
440-136507-1/2	PC-98R-EM06	440-136507-2	Water	1/28/2016	NORM	Stage 2B		X		X			
440-136507-1/2	BH-01-EM06	440-136507-3	Water	1/28/2016	NORM	Stage 2B		X		X			
440-136507-1/2	MW-K5-EM06	440-136507-4	Water	1/28/2016	NORM	Stage 2B		X		X			
440-138886-1	FIELDQC-EM07-EB	440-138886-1	Water	2/22/2016	EB	Stage 2B		X	X	X	X	X	X
440-138886-1	FIELDQC-EM07-EBMS	440-138886-1	Water	2/22/2016	MS	Stage 2B						X	
440-138886-1	FIELDQC-EM07-EBSD	440-138886-1	Water	2/22/2016	MSD	Stage 2B						X	
440-138886-1	FIELDQC-EM07-FB	440-138886-2	Water	2/22/2016	FB	Stage 2B		X	X	X	X	X	X
440-139059-1	PC-98R-EM07	440-139059-1	Water	2/23/2016	NORM	Stage 2B		X		X			
440-139059-1	BP-MW09-EM07	440-139059-2	Water	2/23/2016	NORM	Stage 2B		X	X	X	X	X	X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-139059-1	BP-MW07-EM07	440-139059-3	Water	2/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139059-1	BP-MW07-EM07MS	440-139059-3	Water	2/23/2016	MS	Stage 2B		X	X	X	X	X	
440-139059-1	BP-MW07-EM07SD	440-139059-3	Water	2/23/2016	MSD	Stage 2B		X	X	X	X	X	
440-139059-1	BP-MW02-EM07	440-139059-4	Water	2/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139059-1	BP-MW02-EM07-FD	440-139059-5	Water	2/23/2016	FD	Stage 2B		X	X	X	X	X	X
440-139059-1	BP-MW04-EM07	440-139059-6	Water	2/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BH-01-EM07	440-139184-1	Water	2/24/2016	NORM	Stage 2B		X		X			
440-139184-1	MW-K5-EM07	440-139184-2	Water	2/24/2016	NORM	Stage 2B		X		X			
440-139184-1	MW-K5-EM07MS	440-139184-2	Water	2/24/2016	MS	Stage 2B							
440-139184-1	MW-K5-EM07SD	440-139184-2	Water	2/24/2016	MSD	Stage 2B							
440-139184-1	BP-MW01-EM07	440-139184-3	Water	2/24/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BP-MW01-EM07MS	440-139184-3	Water	2/24/2016	MS	Stage 2B							
440-139184-1	BP-MW01-EM07SD	440-139184-3	Water	2/24/2016	MSD	Stage 2B							
440-139184-1	BP-MW05-EM07	440-139184-4	Water	2/24/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BP-MW03-EM07	440-139184-5	Water	2/24/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BP-MW03-EM07MS	440-139184-5	Water	2/24/2016	MS	Stage 2B							
440-139184-1	BP-MW03-EM07SD	440-139184-5	Water	2/24/2016	MSD	Stage 2B							
440-139184-1	BP-MW06-EM07	440-139184-6	Water	2/24/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BP-MW08-EM07	440-139184-7	Water	2/24/2016	NORM	Stage 2B		X	X	X	X	X	X
440-139184-1	BP-MW08-EM07MS	440-139184-7	Water	2/24/2016	MS	Stage 2B							
440-142130-1	FIELDQC-EM08-EB	440-142130-1	Water	3/21/2016	EB	Stage 2B		X	X	X	X	X	X
440-142130-1	FIELDQC-EM08-EBMS	440-142130-1	Water	3/21/2016	MS	Stage 2B					X		
440-142130-1	FIELDQC-EM08-EBSD	440-142130-1	Water	3/21/2016	MSD	Stage 2B					X		
440-142130-1	FIELDQC-EM08-FB	440-142130-2	Water	3/21/2016	FB	Stage 2B		X	X	X	X	X	X
440-142130-1	BP-MW08-EM08	440-142130-3	Water	3/21/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142130-1	BP-MW08-EM08MS	440-142130-3	Water	3/21/2016	MS	Stage 2B							
440-142130-1	BP-MW08-EM08SD	440-142130-3	Water	3/21/2016	MSD	Stage 2B							
440-142292-1/2	BH-01-EM08	440-142292-1	Water	3/22/2016	NORM	Stage 2B		X		X			
440-142292-1/2	MW-K5-EM08	440-142292-2	Water	3/22/2016	NORM	Stage 2B		X		X			
440-142292-1/2	BP-MW09-EM08	440-142292-3	Water	3/22/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142292-1/2	BP-MW09-EM08MS	440-142292-3	Water	3/22/2016	MS	Stage 2B							
440-142292-1/2	BP-MW09-EM08SD	440-142292-3	Water	3/22/2016	MSD	Stage 2B							
440-142292-1/2	BP-MW01-EM08	440-142292-4	Water	3/22/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142292-1/2	BP-MW01-EM08MS	440-142292-4	Water	3/22/2016	MS	Stage 2B		X					
440-142292-1/2	BP-MW01-EM08SD	440-142292-4	Water	3/22/2016	MSD	Stage 2B		X					
440-142292-1/2	BP-MW05-EM08	440-142292-5	Water	3/22/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142292-1/2	BP-MW02-EM08	440-142292-6	Water	3/22/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142292-1/2	BP-MW02-EM08MS	440-142292-6	Water	3/22/2016	MS	Stage 2B							

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-142292-1/2	BP-MW02-EM08SD	440-142292-6	Water	3/22/2016	MSD	Stage 2B							
440-142292-1/2	BP-MW02-EM08-FD	440-142292-7	Water	3/22/2016	FD	Stage 2B		X	X	X	X	X	X
440-142440-1/2	PC-98-EM08	440-142440-1	Water	3/23/2016	NORM	Stage 2B		X		X			
440-142440-1/2	PC-98-EM08MS	440-142440-1	Water	3/23/2016	MS	Stage 2B		X					
440-142440-1/2	PC-98-EM08SD	440-142440-1	Water	3/23/2016	MSD	Stage 2B		X					
440-142440-1/2	BP-MW07-EM08	440-142440-2	Water	3/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142440-1/2	BP-MW07-EM08MS	440-142440-2	Water	3/23/2016	MS	Stage 2B		X	X	X	X	X	
440-142440-1/2	BP-MW07-EM08SD	440-142440-2	Water	3/23/2016	MSD	Stage 2B		X	X	X	X	X	
440-142440-1/2	BP-MW03-EM08	440-142440-3	Water	3/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142440-1/2	BP-MW06-EM08	440-142440-4	Water	3/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142440-1/2	BP-MW04-EM08	440-142440-5	Water	3/23/2016	NORM	Stage 2B		X	X	X	X	X	X
440-142440-1/2	BP-MW04-EM08MS	440-142440-5	Water	3/23/2016	MS	Stage 2B							
440-142440-1/2	440-142440-A-2 MSMS	440-142440-A-2 MS	Water	3/23/2016	MS	Stage 2B		X					
440-142440-1/2	440-142440-A-2 MSDSD	440-142440-A-2 MSD	Water	3/23/2016	MSD	Stage 2B		X					
440-142440-1/2	440-142440-J-2 MS ^10MS	440-142440-J-2MS	Water	3/23/2016	MS	Stage 2B							
440-142440-1/2	440-142440-J-2 MSD ^10SD	440-142440-J-2MSD	Water	3/23/2016	MSD	Stage 2B							
440-144883-1	BP-MW08-EM09	440-144883-1	Water	4/19/2016	NORM	Stage 2B		X	X	X	X	X	X
440-144883-1	BP-MW08-EM09MS	440-144883-1	Water	4/19/2016	MS	Stage 2B							
440-144883-1	BP-MW08-EM09SD	440-144883-1	Water	4/19/2016	MSD	Stage 2B							
440-144883-1	BP-MW04-EM09	440-144883-2	Water	4/19/2016	NORM	Stage 2B		X	X	X	X	X	X
440-144883-1	BP-MW02-EM09	440-144883-3	Water	4/19/2016	NORM	Stage 2B		X	X	X	X	X	X
440-144883-1	BP-MW02-EM09-FD	440-144883-4	Water	4/19/2016	FD	Stage 2B		X	X	X	X	X	X
440-144883-1	BP-MW02-EM09-FDMS	440-144883-4	Water	4/19/2016	MS	Stage 2B		X					
440-144883-1	BP-MW02-EM09-FDSD	440-144883-4	Water	4/19/2016	MSD	Stage 2B		X					
440-144883-1	BP-MW06-EM09	440-144883-5	Water	4/19/2016	NORM	Stage 2B		X	X	X	X	X	X
440-144883-1	PC-98R-EM09	440-144883-6	Water	4/19/2016	NORM	Stage 2B		X		X			
440-145019-1	BH-01-EM09	440-145019-1	Water	4/20/2016	NORM	Stage 2B		X		X			
440-145019-1	MW-K5-EM09	440-145019-2	Water	4/20/2016	NORM	Stage 2B		X		X			
440-145019-1	BP-MW01-EM09	440-145019-3	Water	4/20/2016	NORM	Stage 2B		X	X	X	X	X	X
440-145019-1	BP-MW03-EM09	440-145019-4	Water	4/20/2016	NORM	Stage 2B		X	X	X	X	X	X
440-145019-1	BP-MW05-EM09	440-145019-5	Water	4/20/2016	NORM	Stage 2B		X	X	X	X	X	X
440-145019-1	BP-MW07-EM09	440-145019-6	Water	4/20/2016	NORM	Stage 2B		X	X	X	X	X	X
440-145019-1	BP-MW07-EM09MS	440-145019-6	Water	4/20/2016	MS	Stage 2B		X	X	X	X	X	
440-145019-1	BP-MW07-EM09SD	440-145019-6	Water	4/20/2016	MSD	Stage 2B		X	X	X	X	X	
440-145019-1	BP-MW09-EM09	440-145019-7	Water	4/20/2016	NORM	Stage 2B		X	X	X	X	X	X
440-145019-1	FIELDQC-EM09-EB	440-145019-8	Water	4/20/2016	EB	Stage 2B		X	X	X	X	X	X
440-145019-1	FIELDQC-EM09-EBMS	440-145019-8	Water	4/20/2016	MS	Stage 2B							
440-145019-1	FIELDQC-EM09-EBSD	440-145019-8	Water	4/20/2016	MSD	Stage 2B							

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-145019-1	FIELDQC-EM09-FB	440-145019-9	Water	4/20/2016	FB	Stage 2B		X	X	X	X	X	X
440-147424-1	BP-IW01-EM09B	440-147424-1	Water	5/12/2016	NORM	Stage 2B		X		X			
440-147424-1	BP-IW02-EM09B	440-147424-2	Water	5/12/2016	NORM	Stage 2B		X		X			
440-147424-1	BP-IW03-EM09B	440-147424-3	Water	5/12/2016	NORM	Stage 2B		X		X			
440-147621-1	FIELD QC EM10-EB	440-147621-1	Water	5/16/2016	EB	Stage 4		X	X	X	X	X	X
440-147621-1	FIELD QC EM10-EBMS	440-147621-1	Water	5/16/2016	MS	Stage 4							
440-147621-1	FIELD QC EM10-EBSD	440-147621-1	Water	5/16/2016	MSD	Stage 4							
440-147621-1	FIELD QC-EM10-FB	440-147621-2	Water	5/16/2016	FB	Stage 4		X	X	X	X	X	X
440-147621-1	FIELD QC-EM10-FBMS	440-147621-2	Water	5/16/2016	MS	Stage 4							
440-147621-1	FIELD QC-EM10-FBSD	440-147621-2	Water	5/16/2016	MSD	Stage 4							
440-147621-1	BP-MW04-EM10	440-147621-3	Water	5/16/2016	NORM	Stage 4		X	X	X	X	X	X
440-147753-1/2	MW-K5-EM10	440-147753-1	Water	5/17/2016	NORM	Stage 4		X		X			
440-147753-1/2	BH-01-EM10	440-147753-2	Water	5/17/2016	NORM	Stage 4		X		X			
440-147753-1/2	PC-98R-EM10	440-147753-3	Water	5/17/2016	NORM	Stage 4		X		X			
440-147753-1/2	PC-98R-EM10MS	440-147753-3	Water	5/17/2016	MS	Stage 4							
440-147753-1/2	PC-98R-EM10SD	440-147753-3	Water	5/17/2016	MSD	Stage 4							
440-147753-1/2	BP-MW02-EM10	440-147753-4	Water	5/17/2016	NORM	Stage 4		X	X	X	X	X	X
440-147753-1/2	BP-MW02-EM10-FD	440-147753-5	Water	5/17/2016	FD	Stage 4		X	X	X	X	X	X
440-147753-1/2	BP-MW02-EM10-FDMS	440-147753-5	Water	5/17/2016	MS	Stage 4							
440-147753-1/2	BP-MW02-EM10-FDSD	440-147753-5	Water	5/17/2016	MSD	Stage 4							
440-147753-1/2	BP-MW08-EM10	440-147753-6	Water	5/17/2016	NORM	Stage 4		X	X	X	X	X	X
440-147753-1/2	BP-MW06-EM10	440-147753-7	Water	5/17/2016	NORM	Stage 4		X	X	X	X	X	X
440-147753-1/2	BP-MW06-EM10MS	440-147753-7	Water	5/17/2016	MS	Stage 4		X					
440-147753-1/2	BP-MW06-EM10SD	440-147753-7	Water	5/17/2016	MSD	Stage 4		X					
440-147905-1	BP-MW03-EM10	440-147905-1	Water	5/18/2016	NORM	Stage 4		X	X	X	X	X	X
440-147905-1	BP-MW07-EM10	440-147905-2	Water	5/18/2016	NORM	Stage 4		X	X	X	X	X	X
440-147905-1	BP-MW07-EM10MS	440-147905-2	Water	5/18/2016	MS	Stage 4		X	X	X	X	X	
440-147905-1	BP-MW07-EM10SD	440-147905-2MSD	Water	5/18/2016	MSD	Stage 4		X	X	X	X	X	
440-147905-1	BP-MW09-EM10	440-147905-3	Water	5/18/2016	NORM	Stage 4		X	X	X	X	X	X
440-147905-1	BP-MW05-EM10	440-147905-4	Water	5/18/2016	NORM	Stage 4		X	X	X	X	X	X
440-147905-1	BP-MW01-EM10	440-147905-5	Water	5/18/2016	NORM	Stage 4		X	X	X	X	X	X
440-154949-1	FIELDQC-EM11-FB	440-154949-1	Water	8/8/2016	FB	Stage 2B		X	X	X	X	X	X
440-154949-1	FIELDQC-EM11-FBMS	440-154949-1	Water	8/8/2016	MS	Stage 2B						X	
440-154949-1	FIELDQC-EM11-FBSD	440-154949-1	Water	8/8/2016	MSD	Stage 2B						X	
440-154949-1	FIELDQC-EM11-EB	440-154949-2	Water	8/8/2016	EB	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW09-EM11	440-155093-1	Water	8/9/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW07-EM11	440-155093-2	Water	8/9/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW07-EM11MS	440-155093-2MS	Water	8/9/2016	MS	Stage 2B		X	X	X	X	X	

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Dissolved Nitrate by E300.0	Anions by E300.0	Chlorate and Chlorite by E300.1	Perchlorate by E314.0	TKN by E351.2	Total Phosphorus by E365.3	Total Nitrogen (calculated)
440-155093-1	BP-MW07-EM11SD	440-155093-2MSD	Water	8/9/2016	MSD	Stage 2B		X	X	X	X	X	
440-155093-1	BP-MW02-EM11	440-155093-3	Water	8/9/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW02-EM11-FD	440-155093-4	Water	8/9/2016	FD	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW02-EM11-FDMS	440-155093-4	Water	8/9/2016	MS	Stage 2B		X					
440-155093-1	BP-MW02-EM11-FDSD	440-155093-4	Water	8/9/2016	MSD	Stage 2B		X					
440-155093-1	BP-MW04-EM11	440-155093-5	Water	8/9/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155093-1	BP-MW08-EM11	440-155093-6	Water	8/9/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155280-1	BP-MW06-EM11	440-155280-1	Water	8/10/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155280-1	BP-MW06-EM11MS	440-155280-1	Water	8/10/2016	MS	Stage 2B							
440-155280-1	BP-MW06-EM11SD	440-155280-1	Water	8/10/2016	MSD	Stage 2B							
440-155280-1	BP-MW03-EM11	440-155280-2	Water	8/10/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155280-1	BP-MW03-EM11MS	440-155280-2	Water	8/10/2016	MS	Stage 2B							
440-155280-1	BP-MW03-EM11SD	440-155280-2	Water	8/10/2016	MSD	Stage 2B							
440-155280-1	BP-MW05-EM11	440-155280-3	Water	8/10/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155280-1	BP-MW01-EM11	440-155280-4	Water	8/10/2016	NORM	Stage 2B		X	X	X	X	X	X
440-155280-1	BP-MW01-EM11MS	440-155280-4	Water	8/10/2016	MS	Stage 2B		X					
440-155280-1	BP-MW01-EM11SD	440-155280-4	Water	8/10/2016	MSD	Stage 2B		X					
440-155280-1	BP-IW-02-EM11	440-155280-5	Water	8/10/2016	NORM	Stage 2B		X	X	X			
440-155522-1	BH-01-EM11	440-155522-1	Water	8/11/2016	NORM	Stage 2B		X		X			
440-155522-1	PC-98R-EM11	440-155522-2	Water	8/11/2016	NORM	Stage 2B		X		X			
440-155522-1	MW-K5-EM11	440-155522-3	Water	8/11/2016	NORM	Stage 2B		X		X			
440-155522-1	BP-IW01-EM11	440-155522-4	Water	8/11/2016	NORM	Stage 2B		X	X	X			
440-155522-1	BP-IW01-EM11MS	440-155522-4	Water	8/11/2016	MS	Stage 2B		X					
440-155522-1	BP-IW01-EM11SD	440-155522-4	Water	8/11/2016	MSD	Stage 2B		X					
440-155522-1	BP-IW03-EM11	440-155522-5	Water	8/11/2016	NORM	Stage 2B		X	X	X			

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-107257-1/2	BHW-1-201504	440-107257-1	Water	4/14/2015	NORM	Stage 2A				X			
440-107257-1/2	MW-K5-201504	440-107257-2	Water	4/15/2015	NORM	Stage 2A	X	X	X	X		X	X
440-107257-1/2	MW-K5-201504MS	440-107257-2	Water	4/15/2015	MS	Stage 2A						X	X
440-107257-1/2	MW-K5-201504SD	440-107257-2	Water	4/15/2015	MSD	Stage 2A						X	X
440-107289-1	BHW-1-0-201504	440-107289-1	Solid	4/14/2015	NORM	Stage 2A		X (soluble)		X (soluble)			X (soluble)
440-107289-1	BHW-1-0-201504MS	440-107289-1	Solid	4/14/2015	MS	Stage 2A							X (soluble)
440-107289-1	BHW-1-0-201504SD	440-107289-1	Solid	4/14/2015	MSD	Stage 2A							X (soluble)
440-107289-1	BHW-1-0-201504-FD	440-107289-2	Solid	4/14/2015	FD	Stage 2A							
440-108121-1	BHW-1-20150427	440-108121-1	Water	4/27/2015	NORM	Stage 2A	X	X	X	X		X	X
440-108121-1	BHW-1-20150427MS	440-108121-1	Water	4/27/2015	MS	Stage 2A						X	
440-108121-1	BHW-1-20150427SD	440-108121-1	Water	4/27/2015	MSD	Stage 2A						X	
440-108121-1	PC-98R-20150427	440-108121-2	Water	4/27/2015	NORM	Stage 2A	X	X	X	X		X	X
440-108121-1	PC-98R-20150427MS	440-108121-2	Water	4/27/2015	MS	Stage 2A							
440-108121-1	PC-98R-20150427SD	440-108121-2	Water	4/27/2015	MSD	Stage 2A							
440-108121-1	PC-98R-20150427-FD	440-108121-3	Water	4/27/2015	FD	Stage 2A							
440-108121-1	FIELDQC-20150427-EB	440-108121-4	Water	4/27/2015	EB	Stage 2A							
440-108121-1	FIELDQC-20150427-FB	440-108121-5	Water	4/27/2015	FB	Stage 2A							
440-119195-1	BP-MW05-A	440-119195-1	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW05-B	440-119195-2	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-A	440-119195-3	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-B	440-119195-4	Solid	8/24/2015	NORM	Stage 2A							
440-119195-1	BP-MW08-BMS	440-119195-4	Solid	8/24/2015	MS	Stage 2A							
440-119195-1	BP-MW08-BSD	440-119195-4	Solid	8/24/2015	MSD	Stage 2A							
440-119195-1	BP-MW08-C	440-119195-5	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-A	440-119195-6	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-B	440-119195-7	Solid	8/25/2015	NORM	Stage 2A							
440-119195-1	BP-IW02-B-FD	440-119195-8	Solid	8/25/2015	FD	Stage 2A							
440-119195-1	BP-IW02-C	440-119195-9	Solid	8/25/2015	NORM	Stage 2A							
440-122031-1	BP-MW08-EMBL	440-122031-1	Water	9/21/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122031-1	BP-MW08-EMBLMS	440-122031-1	Water	9/21/2015	MS	Stage 2B							
440-122031-1	BP-MW08-EMBLSD	440-122031-1	Water	9/21/2015	MSD	Stage 2B							
440-122031-1	BP-MW02-EMBL	440-122031-2	Water	9/21/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122031-1	BP-MW02-EMBLMS	440-122031-2	Water	9/21/2015	MS	Stage 2B							
440-122171-1	BH-1-EMBL	440-122171-1	Water	9/22/2015	NORM	Stage 2B						X	
440-122171-1	BH-1-EMBLMS	440-122171-1	Water	9/22/2015	MS	Stage 2B							
440-122171-1	BH-1-EMBLSD	440-122171-1	Water	9/22/2015	MSD	Stage 2B							
440-122171-1	BP-MW05-EMBL	440-122171-2	Water	9/22/2015	NORM	Stage 2B	X	X	X	X	X	X	X
440-122171-1	BP-MW05-EMBL-FD	440-122171-3	Water	9/22/2015	FD	Stage 2B	X	X	X	X	X	X	X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-122171-1	BP-MW01-EMBL	440-122171-4	Water	9/22/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122171-1	BP-MW01-EMBLMS	440-122171-4	Water	9/22/2015	MS	Stage 2B							
440-122171-1	BP-MW01-EMBLSD	440-122171-4	Water	9/22/2015	MSD	Stage 2B							
440-122171-1	MW-K5-EMBL	440-122171-5	Water	9/22/2015	NORM	Stage 2B						X	
440-122171-1	MW-K5-EMBLMS	440-122171-5	Water	9/22/2015	MS	Stage 2B							
440-122171-1	MW-K5-EMBLSD	440-122171-5	Water	9/22/2015	MSD	Stage 2B							
440-122171-1	FIELD QC-EMBL-EB	440-122171-6	Water	9/22/2015	EB	Stage 2B	X	X	X	X	X	X	X
440-122171-1	FIELD QC-EMBL-EBMS	440-122171-6	Water	9/22/2015	MS	Stage 2B					X		
440-122171-1	FIELD QC-EMBL-EBSD	440-122171-6	Water	9/22/2015	MSD	Stage 2B					X		
440-122317-1	BP-MW06-EMBL	440-122317-1	Water	9/23/2015	NORM	Stage 2B	X	X	X	X	X	X	X
440-122317-1	BP-MW06-EMBLMS	440-122317-1	Water	9/23/2015	MS	Stage 2B							
440-122317-1	BP-MW06-EMBLSD	440-122317-1	Water	9/23/2015	MSD	Stage 2B							
440-122317-1	BP-IW01-EMBL	440-122317-2	Water	9/23/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122317-1	BP-MW07-EMBL	440-122317-3	Water	9/23/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122317-1	BP-IW02-EMBL	440-122317-4	Water	9/23/2015	NORM	Stage 2B	X	X	X	X	X	X	X
440-122317-1	BP-MW09-EMBL	440-122317-5	Water	9/23/2015	NORM	Stage 2B	X	X	X	X		X	X
440-122317-1	BP-IW03-EMBL	440-122317-6	Water	9/23/2015	NORM	Stage 2B	X	X	X	X	X	X	X
440-122317-1	BP-IW03-EMBLMS	440-122317-6	Water	9/23/2015	MS	Stage 2B							
440-122317-1	FIELDQC-EMBL-FB	440-122317-7	Water	9/23/2015	FB	Stage 2B	X	X	X	X	X	X	X
440-122317-1	FIELDQC-EMBL-FBMS	440-122317-7	Water	9/23/2015	MS	Stage 2B							
440-122317-1	FIELDQC-EMBL-FBSD	440-122317-7	Water	9/23/2015	MSD	Stage 2B							
440-122387-1	BP-MW04-EMBL	440-122387-1	Water	9/24/2015	NORM	Stage 2B	X	X	X	X	X	X	X
440-122387-1	BP-MW04-EMBLMS	440-122387-1MS	Water	9/24/2015	MS	Stage 2B					X	X	X
440-122387-1	BP-MW04-EMBLSD	440-122387-1MSD	Water	9/24/2015	MSD	Stage 2B					X	X	X
440-122387-1	BP-MW04-EMBL	440-122387-2	Water	9/24/2015	NORM	Stage 2B							
440-122387-1	BP-MW04-EMBLMS	440-122387-2	Water	9/24/2015	MS	Stage 2B							
440-122387-1	BP-MW04-EMBLSD	440-122387-2	Water	9/24/2015	MSD	Stage 2B							
440-122387-1	BP-MW03-EMBL	440-122387-3	Water	9/24/2015	NORM	Stage 2B	X	X	X	X		X	X
440-130250-1/2	BP-MW01-EM01	440-130250-1	Water	12/8/2015	NORM	Stage 2B				X		X	
440-130250-1/2	BP-MW05-EM01	440-130250-2	Water	12/8/2015	NORM	Stage 2B				X		X	
440-130250-1/2	BP-MW05-EM01MS	440-130250-2	Water	12/8/2015	MS	Stage 2B						X	
440-130250-1/2	BP-MW05-EM01SD	440-130250-2	Water	12/8/2015	MSD	Stage 2B						X	
440-130250-1/2	BP-MW05-EM01-FD	440-130250-3	Water	12/8/2015	FD	Stage 2B				X		X	
440-130250-1/2	BP-MW03-EM01	440-130250-4	Water	12/8/2015	NORM	Stage 2B				X		X	
440-130250-1/2	BP-MW07-EM01	440-130250-5	Water	12/8/2015	NORM	Stage 2B				X		X	
440-130250-1/2	BP-MW09-EM01	440-130250-6	Water	12/8/2015	NORM	Stage 2B				X		X	
440-131167-1/2	FIELDQC-EM02-FB	440-131167-1	Water	12/15/2015	FB	Stage 2B					X	X	
440-131167-1/2	FIELDQC-EM02-FBMS	440-131167-1	Water	12/15/2015	MS	Stage 2B							

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-131167-1/2	FIELDQC-EM02-FBSD	440-131167-1	Water	12/15/2015	MSD	Stage 2B							
440-131167-1/2	FIELDQC-EM02-EB	440-131167-2	Water	12/15/2015	EB	Stage 2B					X	X	
440-131167-1/2	BP-MW06-EM02	440-131167-3	Water	12/15/2015	NORM	Stage 2B						X	
440-131167-1/2	BP-MW06-EM02MS	440-131167-3	Water	12/15/2015	MS	Stage 2B						X	
440-131167-1/2	BP-MW06-EM02SD	440-131167-3	Water	12/15/2015	MSD	Stage 2B						X	
440-131167-1/2	BP-MW09-EM02	440-131167-4	Water	12/15/2015	NORM	Stage 2B					X	X	
440-131337-1/2	BP-MW07-EM02	440-131337-1	Water	12/16/2015	NORM	Stage 2B					X	X	
440-131337-1/2	BP-MW07-EM02MS	440-131337-1	Water	12/16/2015	MS	Stage 2B					X	X	
440-131337-1/2	BP-MW07-EM02SD	440-131337-1	Water	12/16/2015	MSD	Stage 2B					X	X	
440-131337-1/2	BP-MW05-EM02	440-131337-2	Water	12/16/2015	NORM	Stage 2B					X	X	
440-131337-1/2	BP-MW03-EM02	440-131337-3	Water	12/16/2015	NORM	Stage 2B					X	X	
440-131337-1/2	BP-MW01-EM02	440-131337-4	Water	12/16/2015	NORM	Stage 2B					X	X	
440-131433-1	BP-MW04-EM02	440-131433-1	Water	12/17/2015	NORM	Stage 2B						X	
440-131433-1	BP-MW04-EM02MS	440-131433-1	Water	12/17/2015	MS	Stage 2B						X	
440-131433-1	BP-MW04-EM02SD	440-131433-1	Water	12/17/2015	MSD	Stage 2B						X	
440-131433-1	BP-MW02-EM02	440-131433-2	Water	12/17/2015	NORM	Stage 2B						X	
440-131433-1	BP-MW08-EM02	440-131433-3	Water	12/17/2015	NORM	Stage 2B						X	
440-131433-1	BP-MW08-EM02MS	440-131433-3	Water	12/17/2015	MS	Stage 2B							
440-131433-1	BP-MW08-EM02SD	440-131433-3	Water	12/17/2015	MSD	Stage 2B							
440-131796-1	BP-MW01-EM03	440-131796-1	Water	12/21/2015	NORM	Stage 2B				X		X	
440-131796-1	BP-MW02-EM03	440-131796-2	Water	12/21/2015	NORM	Stage 2B						X	
440-131796-1	BP-MW03-EM03	440-131796-3	Water	12/21/2015	NORM	Stage 2B				X		X	
440-131796-1	BP-MW05-EM03	440-131796-4	Water	12/21/2015	NORM	Stage 2B				X		X	
440-131796-1	BP-MW05-EM03MS	440-131796-4	Water	12/21/2015	MS	Stage 2B						X	
440-131796-1	BP-MW05-EM03SD	440-131796-4	Water	12/21/2015	MSD	Stage 2B						X	
440-131796-1	BP-MW05-EM03-FD	440-131796-5	Water	12/21/2015	FD	Stage 2B				X		X	
440-131796-1	BP-MW07-EM03	440-131796-6	Water	12/21/2015	NORM	Stage 2B				X		X	
440-131796-1	BP-MW09-EM03	440-131796-7	Water	12/21/2015	NORM	Stage 2B				X		X	
440-131951-1	BP-MW04-EM03	440-131951-1	Water	12/22/2015	NORM	Stage 2B						X	
440-131951-1	BP-MW06-EM03	440-131951-2	Water	12/22/2015	NORM	Stage 2B						X	
440-131951-1	BP-MW08-EM03	440-131951-3	Water	12/22/2015	NORM	Stage 2B						X	
440-131951-1	BP-MW08-EM03MS	440-131951-3	Water	12/22/2015	MS	Stage 2B							
440-131951-1	BP-MW08-EM03SD	440-131951-3	Water	12/22/2015	MSD	Stage 2B							
440-132568-1/2	BP-MW01-EM04	440-132568-1	Water	12/29/2015	NORM	Stage 2B						X	
440-132568-1/2	BP-MW05-EM04	440-132568-2	Water	12/29/2015	NORM	Stage 2B						X	
440-132568-1/2	BP-MW07-EM04	440-132568-3	Water	12/29/2015	NORM	Stage 2B						X	
440-132568-1/2	BP-MW07-EM04MS	440-132568-3	Water	12/29/2015	MS	Stage 2B						X	
440-132568-1/2	BP-MW07-EM04SD	440-132568-3	Water	12/29/2015	MSD	Stage 2B						X	

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-132568-1/2	BP-MW03-EM04	440-132568-4	Water	12/29/2015	NORM	Stage 2B						X	
440-132568-1/2	BP-MW03-EM04MS	440-132568-4	Water	12/29/2015	MS	Stage 2B							
440-132568-1/2	BP-MW03-EM04SD	440-132568-4	Water	12/29/2015	MSD	Stage 2B							
440-132568-1/2	FIELD QC-EM04-EB	440-132568-5	Water	12/29/2015	EB	Stage 2B						X	
440-132568-1/2	FIELD QC EM04-FB	440-132568-6	Water	12/29/2015	FB	Stage 2B						X	
440-132568-1/2	BP-MW09-EM04	440-132568-7	Water	12/29/2015	NORM	Stage 2B						X	
440-132679-1	BP-MW08-EM04	440-132679-1	Water	12/30/2015	NORM	Stage 2B						X	
440-132679-1	BP-MW06-EM04	440-132679-2	Water	12/30/2015	NORM	Stage 2B						X	
440-132679-1	BP-MW06-EM04MS	440-132679-2	Water	12/30/2015	MS	Stage 2B						X	
440-132679-1	BP-MW06-EM04SD	440-132679-2	Water	12/30/2015	MSD	Stage 2B						X	
440-132679-1	BP-MW02-EM04	440-132679-3	Water	12/30/2015	NORM	Stage 2B						X	
440-132679-1	BP-MW04-EM04	440-132679-4	Water	12/30/2015	NORM	Stage 2B						X	
440-132679-1	BP-MW04-EM04MS	440-132679-4	Water	12/30/2015	MS	Stage 2B							
440-132679-1	BP-MW04-EM04SD	440-132679-4	Water	12/30/2015	MSD	Stage 2B							
440-134828-1/2	BP-MW07-EM05	440-134828-1	Water	1/12/2016	NORM	Stage 2B	X					X	
440-134828-1/2	BP-MW07-EM05MS	440-134828-1	Water	1/12/2016	MS	Stage 2B						X	
440-134828-1/2	BP-MW07-EM05SD	440-134828-1	Water	1/12/2016	MSD	Stage 2B						X	
440-134828-1/2	BP-MW06-EM05	440-134828-2	Water	1/12/2016	NORM	Stage 2B						X	
440-134828-1/2	BP-MW07-EM05-FD	440-134828-3	Water	1/12/2016	FD	Stage 2B	X					X	
440-135045-1/2	BP-MW03-EM05	440-135045-1	Water	1/13/2016	NORM	Stage 2B	X					X	
440-135045-1/2	BP-MW03-EM05MS	440-135045-1	Water	1/13/2016	MS	Stage 2B						X	
440-135045-1/2	BP-MW03-EM05SD	440-135045-1	Water	1/13/2016	MSD	Stage 2B						X	
440-135045-1/2	BP-MW08-EM05	440-135045-2	Water	1/13/2016	NORM	Stage 2B	X					X	
440-135045-1/2	BP-MW05-EM05	440-135045-3	Water	1/13/2016	NORM	Stage 2B	X					X	
440-135045-1/2	BP-MW09-EM05	440-135045-4	Water	1/13/2016	NORM	Stage 2B						X	
440-135045-1/2	BP-MW09-EM05MS	440-135045-4	Water	1/13/2016	MS	Stage 2B							
440-135045-1/2	BP-MW09-EM05SD	440-135045-4	Water	1/13/2016	MSD	Stage 2B							
440-135045-1/2	BP-MW01-EM05	440-135045-5	Water	1/13/2016	NORM	Stage 2B	X					X	
440-135045-1/2	BP-MW02-EM05	440-135045-6	Water	1/13/2016	NORM	Stage 2B						X	
440-135045-1/2	BP-MW04-EM05	440-135045-7	Water	1/13/2016	NORM	Stage 2B	X					X	
440-135159-1/2	BH-01-EM05	440-135159-1	Water	1/14/2016	NORM	Stage 2B						X	
440-135159-1/2	BH-01-EM05MS	440-135159-1	Water	1/14/2016	MS	Stage 2B							
440-135159-1/2	BH-01-EM05SD	440-135159-1	Water	1/14/2016	MSD	Stage 2B							
440-135159-1/2	MW-K5-EM05	440-135159-2	Water	1/14/2016	NORM	Stage 2B						X	
440-135159-1/2	MW-K5-EM05MS	440-135159-2	Water	1/14/2016	MS	Stage 2B						X	
440-135159-1/2	MW-K5-EM05SD	440-135159-2	Water	1/14/2016	MSD	Stage 2B						X	
440-136058-1/2	FIELDQC-EM06-FB	440-136058-1	Water	1/25/2016	FB	Stage 2B	X	X	X	X	X	X	X
440-136058-1/2	FIELDQC-EM06-FBMS	440-136058-1	Water	1/25/2016	MS	Stage 2B							

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-136058-1/2	FIELDQC-EM06-FBSD	440-136058-1	Water	1/25/2016	MSD	Stage 2B							
440-136058-1/2	FIELDQC-EM06-EB	440-136058-2	Water	1/25/2016	EB	Stage 2B	X	X	X	X	X	X	X
440-136058-1/2	FIELDQC-EM06-EBMS	440-136058-2	Water	1/25/2016	MS	Stage 2B							
440-136058-1/2	FIELDQC-EM06-EBSD	440-136058-2	Water	1/25/2016	MSD	Stage 2B							
440-136168-1/2	BP-MW09-EM06	440-136168-1	Water	1/26/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136168-1/2	BP-MW09-EM06MS	440-136168-1	Water	1/26/2016	MS	Stage 2B							
440-136168-1/2	BP-MW09-EM06SD	440-136168-1	Water	1/26/2016	MSD	Stage 2B							
440-136168-1/2	BP-MW07-EM06	440-136168-2	Water	1/26/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136168-1/2	BP-MW07-EM06MS	440-136168-2	Water	1/26/2016	MS	Stage 2B					X	X	X
440-136168-1/2	BP-MW07-EM06SD	440-136168-2	Water	1/26/2016	MSD	Stage 2B					X	X	X
440-136168-1/2	BP-MW05-EM06	440-136168-3	Water	1/26/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136168-1/2	BP-MW06-EM06	440-136168-4	Water	1/26/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136168-1/2	BP-MW06-EM06MS	440-136168-4	Water	1/26/2016	MS	Stage 2B							
440-136168-1/2	BP-MW06-EM06SD	440-136168-4	Water	1/26/2016	MSD	Stage 2B							
440-136168-1/2	BP-MW02-EM06	440-136168-5	Water	1/26/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136168-1/2	BP-MW02-EM06-FD	440-136168-6	Water	1/26/2016	FD	Stage 2B	X	X	X	X	X	X	X
440-136337-1/2	BP-IW01-EM06	440-136337-1	Water	1/27/2016	NORM	Stage 2B						X	
440-136337-1/2	BP-MW01-EM06	440-136337-2	Water	1/27/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136337-1/2	BP-MW01-EM06MS	440-136337-2	Water	1/27/2016	MS	Stage 2B							
440-136337-1/2	BP-MW01-EM06SD	440-136337-2	Water	1/27/2016	MSD	Stage 2B							
440-136337-1/2	BP-MW03-EM06	440-136337-3	Water	1/27/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136337-1/2	BP-MW08-EM06	440-136337-4	Water	1/27/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136337-1/2	BP-MW08-EM06MS	440-136337-4	Water	1/27/2016	MS	Stage 2B							
440-136337-1/2	BP-MW08-EM06SD	440-136337-4	Water	1/27/2016	MSD	Stage 2B							
440-136337-1/2	BP-MW04-EM06	440-136337-5	Water	1/27/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-136337-1/2	BP-MW04-EM06MS	440-136337-5	Water	1/27/2016	MS	Stage 2B							
440-136337-1/2	BP-MW04-EM06SD	440-136337-5	Water	1/27/2016	MSD	Stage 2B							
440-136337-1/2	BP-IW03-EM06	440-136337-6	Water	1/27/2016	NORM	Stage 2B						X	
440-136507-1/2	BP-IW02-EM06	440-136507-1	Water	1/28/2016	NORM	Stage 2B						X	
440-136507-1/2	PC-98R-EM06	440-136507-2	Water	1/28/2016	NORM	Stage 2B						X	
440-136507-1/2	BH-01-EM06	440-136507-3	Water	1/28/2016	NORM	Stage 2B						X	
440-136507-1/2	MW-K5-EM06	440-136507-4	Water	1/28/2016	NORM	Stage 2B						X	
440-138886-1	FIELDQC-EM07-EB	440-138886-1	Water	2/22/2016	EB	Stage 2B	X	X	X	X	X	X	X
440-138886-1	FIELDQC-EM07-EBMS	440-138886-1	Water	2/22/2016	MS	Stage 2B							
440-138886-1	FIELDQC-EM07-EBSD	440-138886-1	Water	2/22/2016	MSD	Stage 2B							
440-138886-1	FIELDQC-EM07-FB	440-138886-2	Water	2/22/2016	FB	Stage 2B	X	X	X	X	X	X	X
440-139059-1	PC-98R-EM07	440-139059-1	Water	2/23/2016	NORM	Stage 2B						X	
440-139059-1	BP-MW09-EM07	440-139059-2	Water	2/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-139059-1	BP-MW07-EM07	440-139059-3	Water	2/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139059-1	BP-MW07-EM07MS	440-139059-3	Water	2/23/2016	MS	Stage 2B					X	X	X
440-139059-1	BP-MW07-EM07SD	440-139059-3	Water	2/23/2016	MSD	Stage 2B					X	X	X
440-139059-1	BP-MW02-EM07	440-139059-4	Water	2/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139059-1	BP-MW02-EM07-FD	440-139059-5	Water	2/23/2016	FD	Stage 2B	X	X	X	X	X	X	X
440-139059-1	BP-MW04-EM07	440-139059-6	Water	2/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BH-01-EM07	440-139184-1	Water	2/24/2016	NORM	Stage 2B						X	
440-139184-1	MW-K5-EM07	440-139184-2	Water	2/24/2016	NORM	Stage 2B						X	
440-139184-1	MW-K5-EM07MS	440-139184-2	Water	2/24/2016	MS	Stage 2B						X	
440-139184-1	MW-K5-EM07SD	440-139184-2	Water	2/24/2016	MSD	Stage 2B						X	
440-139184-1	BP-MW01-EM07	440-139184-3	Water	2/24/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BP-MW01-EM07MS	440-139184-3	Water	2/24/2016	MS	Stage 2B							X
440-139184-1	BP-MW01-EM07SD	440-139184-3	Water	2/24/2016	MSD	Stage 2B							X
440-139184-1	BP-MW05-EM07	440-139184-4	Water	2/24/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BP-MW03-EM07	440-139184-5	Water	2/24/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BP-MW03-EM07MS	440-139184-5	Water	2/24/2016	MS	Stage 2B							
440-139184-1	BP-MW03-EM07SD	440-139184-5	Water	2/24/2016	MSD	Stage 2B							
440-139184-1	BP-MW06-EM07	440-139184-6	Water	2/24/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BP-MW08-EM07	440-139184-7	Water	2/24/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-139184-1	BP-MW08-EM07MS	440-139184-7	Water	2/24/2016	MS	Stage 2B							
440-142130-1	FIELDQC-EM08-EB	440-142130-1	Water	3/21/2016	EB	Stage 2B	X	X		X	X	X	X
440-142130-1	FIELDQC-EM08-EBMS	440-142130-1	Water	3/21/2016	MS	Stage 2B					X		
440-142130-1	FIELDQC-EM08-EBSD	440-142130-1	Water	3/21/2016	MSD	Stage 2B					X		
440-142130-1	FIELDQC-EM08-FB	440-142130-2	Water	3/21/2016	FB	Stage 2B	X	X		X	X	X	X
440-142130-1	BP-MW08-EM08	440-142130-3	Water	3/21/2016	NORM	Stage 2B	X	X		X	X	X	X
440-142130-1	BP-MW08-EM08MS	440-142130-3	Water	3/21/2016	MS	Stage 2B							
440-142130-1	BP-MW08-EM08SD	440-142130-3	Water	3/21/2016	MSD	Stage 2B							
440-142292-1/2	BH-01-EM08	440-142292-1	Water	3/22/2016	NORM	Stage 2B						X	
440-142292-1/2	MW-K5-EM08	440-142292-2	Water	3/22/2016	NORM	Stage 2B						X	
440-142292-1/2	BP-MW09-EM08	440-142292-3	Water	3/22/2016	NORM	Stage 2B	X	X		X	X	X	X
440-142292-1/2	BP-MW09-EM08MS	440-142292-3	Water	3/22/2016	MS	Stage 2B							X
440-142292-1/2	BP-MW09-EM08SD	440-142292-3	Water	3/22/2016	MSD	Stage 2B							X
440-142292-1/2	BP-MW01-EM08	440-142292-4	Water	3/22/2016	NORM	Stage 2B	X	X		X	X	X	X
440-142292-1/2	BP-MW01-EM08MS	440-142292-4	Water	3/22/2016	MS	Stage 2B							
440-142292-1/2	BP-MW01-EM08SD	440-142292-4	Water	3/22/2016	MSD	Stage 2B							
440-142292-1/2	BP-MW05-EM08	440-142292-5	Water	3/22/2016	NORM	Stage 2B	X	X		X	X	X	X
440-142292-1/2	BP-MW02-EM08	440-142292-6	Water	3/22/2016	NORM	Stage 2B	X	X		X	X	X	X
440-142292-1/2	BP-MW02-EM08MS	440-142292-6	Water	3/22/2016	MS	Stage 2B							

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-142292-1/2	BP-MW02-EM08SD	440-142292-6	Water	3/22/2016	MSD	Stage 2B							
440-142292-1/2	BP-MW02-EM08-FD	440-142292-7	Water	3/22/2016	FD	Stage 2B	X	X		X	X	X	X
440-142440-1/2	PC-98-EM08	440-142440-1	Water	3/23/2016	NORM	Stage 2B						X	
440-142440-1/2	PC-98-EM08MS	440-142440-1	Water	3/23/2016	MS	Stage 2B							
440-142440-1/2	PC-98-EM08SD	440-142440-1	Water	3/23/2016	MSD	Stage 2B							
440-142440-1/2	BP-MW07-EM08	440-142440-2	Water	3/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-142440-1/2	BP-MW07-EM08MS	440-142440-2	Water	3/23/2016	MS	Stage 2B					X	X	X
440-142440-1/2	BP-MW07-EM08SD	440-142440-2	Water	3/23/2016	MSD	Stage 2B					X	X	X
440-142440-1/2	BP-MW03-EM08	440-142440-3	Water	3/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-142440-1/2	BP-MW06-EM08	440-142440-4	Water	3/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-142440-1/2	BP-MW04-EM08	440-142440-5	Water	3/23/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-142440-1/2	BP-MW04-EM08MS	440-142440-5	Water	3/23/2016	MS	Stage 2B							
440-142440-1/2	440-142440-A-2 MSMS	440-142440-A-2 MS	Water	3/23/2016	MS	Stage 2B							
440-142440-1/2	440-142440-A-2 MSDSD	440-142440-A-2 MSD	Water	3/23/2016	MSD	Stage 2B							
440-142440-1/2	440-142440-J-2 MS ^10MS	440-142440-J-2MS	Water	3/23/2016	MS	Stage 2B						X	
440-142440-1/2	440-142440-J-2 MSD ^10SD	440-142440-J-2MSD	Water	3/23/2016	MSD	Stage 2B						X	
440-144883-1	BP-MW08-EM09	440-144883-1	Water	4/19/2016	NORM	Stage 2B	X	X	X	X		X	X
440-144883-1	BP-MW08-EM09MS	440-144883-1	Water	4/19/2016	MS	Stage 2B							X
440-144883-1	BP-MW08-EM09SD	440-144883-1	Water	4/19/2016	MSD	Stage 2B							X
440-144883-1	BP-MW04-EM09	440-144883-2	Water	4/19/2016	NORM	Stage 2B	X	X	X	X		X	X
440-144883-1	BP-MW02-EM09	440-144883-3	Water	4/19/2016	NORM	Stage 2B	X	X	X	X		X	X
440-144883-1	BP-MW02-EM09-FD	440-144883-4	Water	4/19/2016	FD	Stage 2B	X	X	X	X		X	X
440-144883-1	BP-MW02-EM09-FDMS	440-144883-4	Water	4/19/2016	MS	Stage 2B							
440-144883-1	BP-MW02-EM09-FDSD	440-144883-4	Water	4/19/2016	MSD	Stage 2B							
440-144883-1	BP-MW06-EM09	440-144883-5	Water	4/19/2016	NORM	Stage 2B	X	X	X	X		X	X
440-144883-1	PC-98R-EM09	440-144883-6	Water	4/19/2016	NORM	Stage 2B						X	X
440-145019-1	BH-01-EM09	440-145019-1	Water	4/20/2016	NORM	Stage 2B						X	X
440-145019-1	MW-K5-EM09	440-145019-2	Water	4/20/2016	NORM	Stage 2B						X	X
440-145019-1	BP-MW01-EM09	440-145019-3	Water	4/20/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-145019-1	BP-MW03-EM09	440-145019-4	Water	4/20/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-145019-1	BP-MW05-EM09	440-145019-5	Water	4/20/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-145019-1	BP-MW07-EM09	440-145019-6	Water	4/20/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-145019-1	BP-MW07-EM09MS	440-145019-6	Water	4/20/2016	MS	Stage 2B					X	X	X
440-145019-1	BP-MW07-EM09SD	440-145019-6	Water	4/20/2016	MSD	Stage 2B					X	X	X
440-145019-1	BP-MW09-EM09	440-145019-7	Water	4/20/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-145019-1	FIELDQC-EM09-EB	440-145019-8	Water	4/20/2016	EB	Stage 2B	X	X	X	X	X	X	X
440-145019-1	FIELDQC-EM09-EBMS	440-145019-8	Water	4/20/2016	MS	Stage 2B							X
440-145019-1	FIELDQC-EM09-EBSD	440-145019-8	Water	4/20/2016	MSD	Stage 2B							X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-145019-1	FIELDQC-EM09-FB	440-145019-9	Water	4/20/2016	FB	Stage 2B	X	X	X	X	X	X	X
440-147424-1	BP-IW01-EM09B	440-147424-1	Water	5/12/2016	NORM	Stage 2B						X	
440-147424-1	BP-IW02-EM09B	440-147424-2	Water	5/12/2016	NORM	Stage 2B						X	
440-147424-1	BP-IW03-EM09B	440-147424-3	Water	5/12/2016	NORM	Stage 2B						X	
440-147621-1	FIELD QC EM10-EB	440-147621-1	Water	5/16/2016	EB	Stage 4	X	X	X	X		X	X
440-147621-1	FIELD QC EM10-EBMS	440-147621-1	Water	5/16/2016	MS	Stage 4							
440-147621-1	FIELD QC EM10-EBSD	440-147621-1	Water	5/16/2016	MSD	Stage 4							
440-147621-1	FIELD QC-EM10-FB	440-147621-2	Water	5/16/2016	FB	Stage 4	X	X	X	X		X	X
440-147621-1	FIELD QC-EM10-FBMS	440-147621-2	Water	5/16/2016	MS	Stage 4							
440-147621-1	FIELD QC-EM10-FBSD	440-147621-2	Water	5/16/2016	MSD	Stage 4							
440-147621-1	BP-MW04-EM10	440-147621-3	Water	5/16/2016	NORM	Stage 4	X	X	X	X		X	X
440-147753-1/2	MW-K5-EM10	440-147753-1	Water	5/17/2016	NORM	Stage 4						X	X
440-147753-1/2	BH-01-EM10	440-147753-2	Water	5/17/2016	NORM	Stage 4						X	X
440-147753-1/2	PC-98R-EM10	440-147753-3	Water	5/17/2016	NORM	Stage 4							X
440-147753-1/2	PC-98R-EM10MS	440-147753-3	Water	5/17/2016	MS	Stage 4							X
440-147753-1/2	PC-98R-EM10SD	440-147753-3	Water	5/17/2016	MSD	Stage 4							X
440-147753-1/2	BP-MW02-EM10	440-147753-4	Water	5/17/2016	NORM	Stage 4	X	X	X	X		X	X
440-147753-1/2	BP-MW02-EM10-FD	440-147753-5	Water	5/17/2016	FD	Stage 4	X	X	X	X		X	X
440-147753-1/2	BP-MW02-EM10-FDMS	440-147753-5	Water	5/17/2016	MS	Stage 4							
440-147753-1/2	BP-MW02-EM10-FDSD	440-147753-5	Water	5/17/2016	MSD	Stage 4							
440-147753-1/2	BP-MW08-EM10	440-147753-6	Water	5/17/2016	NORM	Stage 4	X	X	X	X		X	X
440-147753-1/2	BP-MW06-EM10	440-147753-7	Water	5/17/2016	NORM	Stage 4	X	X	X	X		X	X
440-147753-1/2	BP-MW06-EM10MS	440-147753-7	Water	5/17/2016	MS	Stage 4							
440-147753-1/2	BP-MW06-EM10SD	440-147753-7	Water	5/17/2016	MSD	Stage 4							
440-147905-1	BP-MW03-EM10	440-147905-1	Water	5/18/2016	NORM	Stage 4	X	X	X	X		X	X
440-147905-1	BP-MW07-EM10	440-147905-2	Water	5/18/2016	NORM	Stage 4	X	X	X	X		X	X
440-147905-1	BP-MW07-EM10MS	440-147905-2	Water	5/18/2016	MS	Stage 4						X	X
440-147905-1	BP-MW07-EM10SD	440-147905-2MSD	Water	5/18/2016	MSD	Stage 4						X	X
440-147905-1	BP-MW09-EM10	440-147905-3	Water	5/18/2016	NORM	Stage 4	X	X	X	X		X	X
440-147905-1	BP-MW05-EM10	440-147905-4	Water	5/18/2016	NORM	Stage 4	X	X	X	X		X	X
440-147905-1	BP-MW01-EM10	440-147905-5	Water	5/18/2016	NORM	Stage 4	X	X	X	X		X	X
440-154949-1	FIELDQC-EM11-FB	440-154949-1	Water	8/8/2016	FB	Stage 2B	X	X	X	X	X	X	X
440-154949-1	FIELDQC-EM11-FBMS	440-154949-1	Water	8/8/2016	MS	Stage 2B							
440-154949-1	FIELDQC-EM11-FBSD	440-154949-1	Water	8/8/2016	MSD	Stage 2B							
440-154949-1	FIELDQC-EM11-EB	440-154949-2	Water	8/8/2016	EB	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW09-EM11	440-155093-1	Water	8/9/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW07-EM11	440-155093-2	Water	8/9/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW07-EM11MS	440-155093-2MS	Water	8/9/2016	MS	Stage 2B					X	X	X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Methane by RSK175	Alkalinity and ions by SM2320	Hardness by SM2340	Total Dissolved Solids by SM2540C	Chemical Oxygen Demand by SM5220	TOC by SM5310	Dissolved Metals by SW6010B
440-155093-1	BP-MW07-EM11SD	440-155093-2MSD	Water	8/9/2016	MSD	Stage 2B					X	X	X
440-155093-1	BP-MW02-EM11	440-155093-3	Water	8/9/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW02-EM11-FD	440-155093-4	Water	8/9/2016	FD	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW02-EM11-FDMS	440-155093-4	Water	8/9/2016	MS	Stage 2B							
440-155093-1	BP-MW02-EM11-FDSD	440-155093-4	Water	8/9/2016	MSD	Stage 2B							
440-155093-1	BP-MW04-EM11	440-155093-5	Water	8/9/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155093-1	BP-MW08-EM11	440-155093-6	Water	8/9/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155280-1	BP-MW06-EM11	440-155280-1	Water	8/10/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155280-1	BP-MW06-EM11MS	440-155280-1	Water	8/10/2016	MS	Stage 2B							X
440-155280-1	BP-MW06-EM11SD	440-155280-1	Water	8/10/2016	MSD	Stage 2B							X
440-155280-1	BP-MW03-EM11	440-155280-2	Water	8/10/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155280-1	BP-MW03-EM11MS	440-155280-2	Water	8/10/2016	MS	Stage 2B							
440-155280-1	BP-MW03-EM11SD	440-155280-2	Water	8/10/2016	MSD	Stage 2B							
440-155280-1	BP-MW05-EM11	440-155280-3	Water	8/10/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155280-1	BP-MW01-EM11	440-155280-4	Water	8/10/2016	NORM	Stage 2B	X	X	X	X	X	X	X
440-155280-1	BP-MW01-EM11MS	440-155280-4	Water	8/10/2016	MS	Stage 2B							
440-155280-1	BP-MW01-EM11SD	440-155280-4	Water	8/10/2016	MSD	Stage 2B							
440-155280-1	BP-IW-02-EM11	440-155280-5	Water	8/10/2016	NORM	Stage 2B						X	
440-155522-1	BH-01-EM11	440-155522-1	Water	8/11/2016	NORM	Stage 2B						X	X
440-155522-1	PC-98R-EM11	440-155522-2	Water	8/11/2016	NORM	Stage 2B						X	X
440-155522-1	MW-K5-EM11	440-155522-3	Water	8/11/2016	NORM	Stage 2B						X	X
440-155522-1	BP-IW01-EM11	440-155522-4	Water	8/11/2016	NORM	Stage 2B						X	
440-155522-1	BP-IW01-EM11MS	440-155522-4	Water	8/11/2016	MS	Stage 2B							
440-155522-1	BP-IW01-EM11SD	440-155522-4	Water	8/11/2016	MSD	Stage 2B							
440-155522-1	BP-IW03-EM11	440-155522-5	Water	8/11/2016	NORM	Stage 2B						X	

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-107257-1/2	BHW-1-201504	440-107257-1	Water	4/14/2015	NORM	Stage 2A						
440-107257-1/2	MW-K5-201504	440-107257-2	Water	4/15/2015	NORM	Stage 2A	X	X	X			X
440-107257-1/2	MW-K5-201504MS	440-107257-2	Water	4/15/2015	MS	Stage 2A						
440-107257-1/2	MW-K5-201504SD	440-107257-2	Water	4/15/2015	MSD	Stage 2A						
440-107289-1	BHW-1-0-201504	440-107289-1	Solid	4/14/2015	NORM	Stage 2A	X	X (Total)	X	X	X	
440-107289-1	BHW-1-0-201504MS	440-107289-1	Solid	4/14/2015	MS	Stage 2A			X		X	
440-107289-1	BHW-1-0-201504SD	440-107289-1	Solid	4/14/2015	MSD	Stage 2A			X		X	
440-107289-1	BHW-1-0-201504-FD	440-107289-2	Solid	4/14/2015	FD	Stage 2A						
440-108121-1	BHW-1-20150427	440-108121-1	Water	4/27/2015	NORM	Stage 2A	X	X	X			X
440-108121-1	BHW-1-20150427MS	440-108121-1	Water	4/27/2015	MS	Stage 2A						
440-108121-1	BHW-1-20150427SD	440-108121-1	Water	4/27/2015	MSD	Stage 2A						
440-108121-1	PC-98R-20150427	440-108121-2	Water	4/27/2015	NORM	Stage 2A	X	X	X			X
440-108121-1	PC-98R-20150427MS	440-108121-2	Water	4/27/2015	MS	Stage 2A	X		X			
440-108121-1	PC-98R-20150427SD	440-108121-2	Water	4/27/2015	MSD	Stage 2A	X		X			
440-108121-1	PC-98R-20150427-FD	440-108121-3	Water	4/27/2015	FD	Stage 2A						
440-108121-1	FIELDQC-20150427-EB	440-108121-4	Water	4/27/2015	EB	Stage 2A						
440-108121-1	FIELDQC-20150427-FB	440-108121-5	Water	4/27/2015	FB	Stage 2A						
440-119195-1	BP-MW05-A	440-119195-1	Solid	8/24/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-MW05-B	440-119195-2	Solid	8/24/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-MW08-A	440-119195-3	Solid	8/24/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-MW08-B	440-119195-4	Solid	8/24/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-MW08-BMS	440-119195-4	Solid	8/24/2015	MS	Stage 2A	X				X	
440-119195-1	BP-MW08-BSD	440-119195-4	Solid	8/24/2015	MSD	Stage 2A	X				X	
440-119195-1	BP-MW08-C	440-119195-5	Solid	8/25/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-IW02-A	440-119195-6	Solid	8/25/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-IW02-B	440-119195-7	Solid	8/25/2015	NORM	Stage 2A	X				X	
440-119195-1	BP-IW02-B-FD	440-119195-8	Solid	8/25/2015	FD	Stage 2A	X				X	
440-119195-1	BP-IW02-C	440-119195-9	Solid	8/25/2015	NORM	Stage 2A	X				X	
440-122031-1	BP-MW08-EMBL	440-122031-1	Water	9/21/2015	NORM	Stage 2B	X	X	X			X
440-122031-1	BP-MW08-EMBLMS	440-122031-1	Water	9/21/2015	MS	Stage 2B						X
440-122031-1	BP-MW08-EMBLSD	440-122031-1	Water	9/21/2015	MSD	Stage 2B						X
440-122031-1	BP-MW02-EMBL	440-122031-2	Water	9/21/2015	NORM	Stage 2B	X	X	X			X
440-122031-1	BP-MW02-EMBLMS	440-122031-2	Water	9/21/2015	MS	Stage 2B						X
440-122171-1	BH-1-EMBL	440-122171-1	Water	9/22/2015	NORM	Stage 2B						
440-122171-1	BH-1-EMBLMS	440-122171-1	Water	9/22/2015	MS	Stage 2B						
440-122171-1	BH-1-EMBLSD	440-122171-1	Water	9/22/2015	MSD	Stage 2B						
440-122171-1	BP-MW05-EMBL	440-122171-2	Water	9/22/2015	NORM	Stage 2B	X	X	X			X
440-122171-1	BP-MW05-EMBL-FD	440-122171-3	Water	9/22/2015	FD	Stage 2B	X	X	X			X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-122171-1	BP-MW01-EMBL	440-122171-4	Water	9/22/2015	NORM	Stage 2B	X	X	X			X
440-122171-1	BP-MW01-EMBLMS	440-122171-4	Water	9/22/2015	MS	Stage 2B			X			
440-122171-1	BP-MW01-EMBLSD	440-122171-4	Water	9/22/2015	MSD	Stage 2B			X			
440-122171-1	MW-K5-EMBL	440-122171-5	Water	9/22/2015	NORM	Stage 2B						
440-122171-1	MW-K5-EMBLMS	440-122171-5	Water	9/22/2015	MS	Stage 2B						
440-122171-1	MW-K5-EMBLSD	440-122171-5	Water	9/22/2015	MSD	Stage 2B						
440-122171-1	FIELD QC-EMBL-EB	440-122171-6	Water	9/22/2015	EB	Stage 2B	X	X	X			X
440-122171-1	FIELD QC-EMBL-EBMS	440-122171-6	Water	9/22/2015	MS	Stage 2B						
440-122171-1	FIELD QC-EMBL-EBSD	440-122171-6	Water	9/22/2015	MSD	Stage 2B						
440-122317-1	BP-MW06-EMBL	440-122317-1	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-MW06-EMBLMS	440-122317-1	Water	9/23/2015	MS	Stage 2B						
440-122317-1	BP-MW06-EMBLSD	440-122317-1	Water	9/23/2015	MSD	Stage 2B						
440-122317-1	BP-IW01-EMBL	440-122317-2	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-MW07-EMBL	440-122317-3	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-IW02-EMBL	440-122317-4	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-MW09-EMBL	440-122317-5	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-IW03-EMBL	440-122317-6	Water	9/23/2015	NORM	Stage 2B	X	X	X			X
440-122317-1	BP-IW03-EMBLMS	440-122317-6	Water	9/23/2015	MS	Stage 2B						X
440-122317-1	FIELDQC-EMBL-FB	440-122317-7	Water	9/23/2015	FB	Stage 2B	X	X	X			X
440-122317-1	FIELDQC-EMBL-FBMS	440-122317-7	Water	9/23/2015	MS	Stage 2B			X			X
440-122317-1	FIELDQC-EMBL-FBSD	440-122317-7	Water	9/23/2015	MSD	Stage 2B			X			
440-122387-1	BP-MW04-EMBL	440-122387-1	Water	9/24/2015	NORM	Stage 2B	X	X				X
440-122387-1	BP-MW04-EMBLMS	440-122387-1MS	Water	9/24/2015	MS	Stage 2B	X	X				X
440-122387-1	BP-MW04-EMBLSD	440-122387-1MSD	Water	9/24/2015	MSD	Stage 2B	X	X				X
440-122387-1	BP-MW04-EMBL	440-122387-2	Water	9/24/2015	NORM	Stage 2B			X			
440-122387-1	BP-MW04-EMBLMS	440-122387-2	Water	9/24/2015	MS	Stage 2B			X			
440-122387-1	BP-MW04-EMBLSD	440-122387-2	Water	9/24/2015	MSD	Stage 2B			X			
440-122387-1	BP-MW03-EMBL	440-122387-3	Water	9/24/2015	NORM	Stage 2B	X	X	X			X
440-130250-1/2	BP-MW01-EM01	440-130250-1	Water	12/8/2015	NORM	Stage 2B						
440-130250-1/2	BP-MW05-EM01	440-130250-2	Water	12/8/2015	NORM	Stage 2B						
440-130250-1/2	BP-MW05-EM01MS	440-130250-2	Water	12/8/2015	MS	Stage 2B						
440-130250-1/2	BP-MW05-EM01SD	440-130250-2	Water	12/8/2015	MSD	Stage 2B						
440-130250-1/2	BP-MW05-EM01-FD	440-130250-3	Water	12/8/2015	FD	Stage 2B						
440-130250-1/2	BP-MW03-EM01	440-130250-4	Water	12/8/2015	NORM	Stage 2B						
440-130250-1/2	BP-MW07-EM01	440-130250-5	Water	12/8/2015	NORM	Stage 2B						
440-130250-1/2	BP-MW09-EM01	440-130250-6	Water	12/8/2015	NORM	Stage 2B						
440-131167-1/2	FIELDQC-EM02-FB	440-131167-1	Water	12/15/2015	FB	Stage 2B	X					
440-131167-1/2	FIELDQC-EM02-FBMS	440-131167-1	Water	12/15/2015	MS	Stage 2B						

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-131167-1/2	FIELDQC-EM02-FBSD	440-131167-1	Water	12/15/2015	MSD	Stage 2B						
440-131167-1/2	FIELDQC-EM02-EB	440-131167-2	Water	12/15/2015	EB	Stage 2B	X					
440-131167-1/2	BP-MW06-EM02	440-131167-3	Water	12/15/2015	NORM	Stage 2B						
440-131167-1/2	BP-MW06-EM02MS	440-131167-3	Water	12/15/2015	MS	Stage 2B						
440-131167-1/2	BP-MW06-EM02SD	440-131167-3	Water	12/15/2015	MSD	Stage 2B						
440-131167-1/2	BP-MW09-EM02	440-131167-4	Water	12/15/2015	NORM	Stage 2B	X					
440-131337-1/2	BP-MW07-EM02	440-131337-1	Water	12/16/2015	NORM	Stage 2B	X					
440-131337-1/2	BP-MW07-EM02MS	440-131337-1	Water	12/16/2015	MS	Stage 2B	X					
440-131337-1/2	BP-MW07-EM02SD	440-131337-1	Water	12/16/2015	MSD	Stage 2B	X					
440-131337-1/2	BP-MW05-EM02	440-131337-2	Water	12/16/2015	NORM	Stage 2B	X					
440-131337-1/2	BP-MW03-EM02	440-131337-3	Water	12/16/2015	NORM	Stage 2B	X					
440-131337-1/2	BP-MW01-EM02	440-131337-4	Water	12/16/2015	NORM	Stage 2B	X					
440-131433-1	BP-MW04-EM02	440-131433-1	Water	12/17/2015	NORM	Stage 2B						
440-131433-1	BP-MW04-EM02MS	440-131433-1	Water	12/17/2015	MS	Stage 2B						
440-131433-1	BP-MW04-EM02SD	440-131433-1	Water	12/17/2015	MSD	Stage 2B						
440-131433-1	BP-MW02-EM02	440-131433-2	Water	12/17/2015	NORM	Stage 2B						
440-131433-1	BP-MW08-EM02	440-131433-3	Water	12/17/2015	NORM	Stage 2B						
440-131433-1	BP-MW08-EM02MS	440-131433-3	Water	12/17/2015	MS	Stage 2B						
440-131433-1	BP-MW08-EM02SD	440-131433-3	Water	12/17/2015	MSD	Stage 2B						
440-131796-1	BP-MW01-EM03	440-131796-1	Water	12/21/2015	NORM	Stage 2B						
440-131796-1	BP-MW02-EM03	440-131796-2	Water	12/21/2015	NORM	Stage 2B						
440-131796-1	BP-MW03-EM03	440-131796-3	Water	12/21/2015	NORM	Stage 2B						
440-131796-1	BP-MW05-EM03	440-131796-4	Water	12/21/2015	NORM	Stage 2B						
440-131796-1	BP-MW05-EM03MS	440-131796-4	Water	12/21/2015	MS	Stage 2B						
440-131796-1	BP-MW05-EM03SD	440-131796-4	Water	12/21/2015	MSD	Stage 2B						
440-131796-1	BP-MW05-EM03-FD	440-131796-5	Water	12/21/2015	FD	Stage 2B						
440-131796-1	BP-MW07-EM03	440-131796-6	Water	12/21/2015	NORM	Stage 2B						
440-131796-1	BP-MW09-EM03	440-131796-7	Water	12/21/2015	NORM	Stage 2B						
440-131951-1	BP-MW04-EM03	440-131951-1	Water	12/22/2015	NORM	Stage 2B						
440-131951-1	BP-MW06-EM03	440-131951-2	Water	12/22/2015	NORM	Stage 2B						
440-131951-1	BP-MW08-EM03	440-131951-3	Water	12/22/2015	NORM	Stage 2B						
440-131951-1	BP-MW08-EM03MS	440-131951-3	Water	12/22/2015	MS	Stage 2B						
440-131951-1	BP-MW08-EM03SD	440-131951-3	Water	12/22/2015	MSD	Stage 2B						
440-132568-1/2	BP-MW01-EM04	440-132568-1	Water	12/29/2015	NORM	Stage 2B	X					X
440-132568-1/2	BP-MW05-EM04	440-132568-2	Water	12/29/2015	NORM	Stage 2B	X					X
440-132568-1/2	BP-MW07-EM04	440-132568-3	Water	12/29/2015	NORM	Stage 2B	X					X
440-132568-1/2	BP-MW07-EM04MS	440-132568-3	Water	12/29/2015	MS	Stage 2B	X					X
440-132568-1/2	BP-MW07-EM04SD	440-132568-3	Water	12/29/2015	MSD	Stage 2B	X					X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-132568-1/2	BP-MW03-EM04	440-132568-4	Water	12/29/2015	NORM	Stage 2B	X					X
440-132568-1/2	BP-MW03-EM04MS	440-132568-4	Water	12/29/2015	MS	Stage 2B						X
440-132568-1/2	BP-MW03-EM04SD	440-132568-4	Water	12/29/2015	MSD	Stage 2B						X
440-132568-1/2	FIELD QC-EM04-EB	440-132568-5	Water	12/29/2015	EB	Stage 2B	X					X
440-132568-1/2	FIELD QC EM04-FB	440-132568-6	Water	12/29/2015	FB	Stage 2B	X					X
440-132568-1/2	BP-MW09-EM04	440-132568-7	Water	12/29/2015	NORM	Stage 2B	X					X
440-132679-1	BP-MW08-EM04	440-132679-1	Water	12/30/2015	NORM	Stage 2B						
440-132679-1	BP-MW06-EM04	440-132679-2	Water	12/30/2015	NORM	Stage 2B						
440-132679-1	BP-MW06-EM04MS	440-132679-2	Water	12/30/2015	MS	Stage 2B						
440-132679-1	BP-MW06-EM04SD	440-132679-2	Water	12/30/2015	MSD	Stage 2B						
440-132679-1	BP-MW02-EM04	440-132679-3	Water	12/30/2015	NORM	Stage 2B						
440-132679-1	BP-MW04-EM04	440-132679-4	Water	12/30/2015	NORM	Stage 2B						
440-132679-1	BP-MW04-EM04MS	440-132679-4	Water	12/30/2015	MS	Stage 2B						
440-132679-1	BP-MW04-EM04SD	440-132679-4	Water	12/30/2015	MSD	Stage 2B						
440-134828-1/2	BP-MW07-EM05	440-134828-1	Water	1/12/2016	NORM	Stage 2B	X					
440-134828-1/2	BP-MW07-EM05MS	440-134828-1	Water	1/12/2016	MS	Stage 2B	X					
440-134828-1/2	BP-MW07-EM05SD	440-134828-1	Water	1/12/2016	MSD	Stage 2B	X					
440-134828-1/2	BP-MW06-EM05	440-134828-2	Water	1/12/2016	NORM	Stage 2B	X					
440-134828-1/2	BP-MW07-EM05-FD	440-134828-3	Water	1/12/2016	FD	Stage 2B	X					
440-135045-1/2	BP-MW03-EM05	440-135045-1	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW03-EM05MS	440-135045-1	Water	1/13/2016	MS	Stage 2B						
440-135045-1/2	BP-MW03-EM05SD	440-135045-1	Water	1/13/2016	MSD	Stage 2B						
440-135045-1/2	BP-MW08-EM05	440-135045-2	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW05-EM05	440-135045-3	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW09-EM05	440-135045-4	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW09-EM05MS	440-135045-4	Water	1/13/2016	MS	Stage 2B						
440-135045-1/2	BP-MW09-EM05SD	440-135045-4	Water	1/13/2016	MSD	Stage 2B						
440-135045-1/2	BP-MW01-EM05	440-135045-5	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW02-EM05	440-135045-6	Water	1/13/2016	NORM	Stage 2B	X					
440-135045-1/2	BP-MW04-EM05	440-135045-7	Water	1/13/2016	NORM	Stage 2B	X					
440-135159-1/2	BH-01-EM05	440-135159-1	Water	1/14/2016	NORM	Stage 2B	X					
440-135159-1/2	BH-01-EM05MS	440-135159-1	Water	1/14/2016	MS	Stage 2B						
440-135159-1/2	BH-01-EM05SD	440-135159-1	Water	1/14/2016	MSD	Stage 2B						
440-135159-1/2	MW-K5-EM05	440-135159-2	Water	1/14/2016	NORM	Stage 2B	X					
440-135159-1/2	MW-K5-EM05MS	440-135159-2	Water	1/14/2016	MS	Stage 2B						
440-135159-1/2	MW-K5-EM05SD	440-135159-2	Water	1/14/2016	MSD	Stage 2B						
440-136058-1/2	FIELDQC-EM06-FB	440-136058-1	Water	1/25/2016	FB	Stage 2B	X	X	X			X
440-136058-1/2	FIELDQC-EM06-FBMS	440-136058-1	Water	1/25/2016	MS	Stage 2B						

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-136058-1/2	FIELDQC-EM06-FBSD	440-136058-1	Water	1/25/2016	MSD	Stage 2B						
440-136058-1/2	FIELDQC-EM06-EB	440-136058-2	Water	1/25/2016	EB	Stage 2B	X	X	X			X
440-136058-1/2	FIELDQC-EM06-EBMS	440-136058-2	Water	1/25/2016	MS	Stage 2B			X			
440-136058-1/2	FIELDQC-EM06-EBSD	440-136058-2	Water	1/25/2016	MSD	Stage 2B			X			
440-136168-1/2	BP-MW09-EM06	440-136168-1	Water	1/26/2016	NORM	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW09-EM06MS	440-136168-1	Water	1/26/2016	MS	Stage 2B	X	X				
440-136168-1/2	BP-MW09-EM06SD	440-136168-1	Water	1/26/2016	MSD	Stage 2B	X	X				
440-136168-1/2	BP-MW07-EM06	440-136168-2	Water	1/26/2016	NORM	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW07-EM06MS	440-136168-2	Water	1/26/2016	MS	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW07-EM06SD	440-136168-2	Water	1/26/2016	MSD	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW05-EM06	440-136168-3	Water	1/26/2016	NORM	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW06-EM06	440-136168-4	Water	1/26/2016	NORM	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW06-EM06MS	440-136168-4	Water	1/26/2016	MS	Stage 2B						
440-136168-1/2	BP-MW06-EM06SD	440-136168-4	Water	1/26/2016	MSD	Stage 2B						
440-136168-1/2	BP-MW02-EM06	440-136168-5	Water	1/26/2016	NORM	Stage 2B	X	X	X			X
440-136168-1/2	BP-MW02-EM06-FD	440-136168-6	Water	1/26/2016	FD	Stage 2B	X	X	X			X
440-136337-1/2	BP-IW01-EM06	440-136337-1	Water	1/27/2016	NORM	Stage 2B						
440-136337-1/2	BP-MW01-EM06	440-136337-2	Water	1/27/2016	NORM	Stage 2B	X	X	X			X
440-136337-1/2	BP-MW01-EM06MS	440-136337-2	Water	1/27/2016	MS	Stage 2B						X
440-136337-1/2	BP-MW01-EM06SD	440-136337-2	Water	1/27/2016	MSD	Stage 2B						X
440-136337-1/2	BP-MW03-EM06	440-136337-3	Water	1/27/2016	NORM	Stage 2B	X	X	X			X
440-136337-1/2	BP-MW08-EM06	440-136337-4	Water	1/27/2016	NORM	Stage 2B	X	X	X			X
440-136337-1/2	BP-MW08-EM06MS	440-136337-4	Water	1/27/2016	MS	Stage 2B						
440-136337-1/2	BP-MW08-EM06SD	440-136337-4	Water	1/27/2016	MSD	Stage 2B						
440-136337-1/2	BP-MW04-EM06	440-136337-5	Water	1/27/2016	NORM	Stage 2B	X	X	X			X
440-136337-1/2	BP-MW04-EM06MS	440-136337-5	Water	1/27/2016	MS	Stage 2B		X				
440-136337-1/2	BP-MW04-EM06SD	440-136337-5	Water	1/27/2016	MSD	Stage 2B		X				
440-136337-1/2	BP-IW03-EM06	440-136337-6	Water	1/27/2016	NORM	Stage 2B						
440-136507-1/2	BP-IW02-EM06	440-136507-1	Water	1/28/2016	NORM	Stage 2B						
440-136507-1/2	PC-98R-EM06	440-136507-2	Water	1/28/2016	NORM	Stage 2B						
440-136507-1/2	BH-01-EM06	440-136507-3	Water	1/28/2016	NORM	Stage 2B						
440-136507-1/2	MW-K5-EM06	440-136507-4	Water	1/28/2016	NORM	Stage 2B						
440-138886-1	FIELDQC-EM07-EB	440-138886-1	Water	2/22/2016	EB	Stage 2B	X	X	X			X
440-138886-1	FIELDQC-EM07-EBMS	440-138886-1	Water	2/22/2016	MS	Stage 2B			X			
440-138886-1	FIELDQC-EM07-EBSD	440-138886-1	Water	2/22/2016	MSD	Stage 2B			X			
440-138886-1	FIELDQC-EM07-FB	440-138886-2	Water	2/22/2016	FB	Stage 2B	X	X	X			X
440-139059-1	PC-98R-EM07	440-139059-1	Water	2/23/2016	NORM	Stage 2B						
440-139059-1	BP-MW09-EM07	440-139059-2	Water	2/23/2016	NORM	Stage 2B	X	X	X			X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-139059-1	BP-MW07-EM07	440-139059-3	Water	2/23/2016	NORM	Stage 2B	X	X	X			X
440-139059-1	BP-MW07-EM07MS	440-139059-3	Water	2/23/2016	MS	Stage 2B	X	X	X			X
440-139059-1	BP-MW07-EM07SD	440-139059-3	Water	2/23/2016	MSD	Stage 2B	X	X	X			X
440-139059-1	BP-MW02-EM07	440-139059-4	Water	2/23/2016	NORM	Stage 2B	X	X	X			X
440-139059-1	BP-MW02-EM07-FD	440-139059-5	Water	2/23/2016	FD	Stage 2B	X	X	X			X
440-139059-1	BP-MW04-EM07	440-139059-6	Water	2/23/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BH-01-EM07	440-139184-1	Water	2/24/2016	NORM	Stage 2B						
440-139184-1	MW-K5-EM07	440-139184-2	Water	2/24/2016	NORM	Stage 2B						
440-139184-1	MW-K5-EM07MS	440-139184-2	Water	2/24/2016	MS	Stage 2B						
440-139184-1	MW-K5-EM07SD	440-139184-2	Water	2/24/2016	MSD	Stage 2B						
440-139184-1	BP-MW01-EM07	440-139184-3	Water	2/24/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BP-MW01-EM07MS	440-139184-3	Water	2/24/2016	MS	Stage 2B						
440-139184-1	BP-MW01-EM07SD	440-139184-3	Water	2/24/2016	MSD	Stage 2B						
440-139184-1	BP-MW05-EM07	440-139184-4	Water	2/24/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BP-MW03-EM07	440-139184-5	Water	2/24/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BP-MW03-EM07MS	440-139184-5	Water	2/24/2016	MS	Stage 2B			X			X
440-139184-1	BP-MW03-EM07SD	440-139184-5	Water	2/24/2016	MSD	Stage 2B			X			
440-139184-1	BP-MW06-EM07	440-139184-6	Water	2/24/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BP-MW08-EM07	440-139184-7	Water	2/24/2016	NORM	Stage 2B	X	X	X			X
440-139184-1	BP-MW08-EM07MS	440-139184-7	Water	2/24/2016	MS	Stage 2B						X
440-142130-1	FIELDQC-EM08-EB	440-142130-1	Water	3/21/2016	EB	Stage 2B	X	X	X			X
440-142130-1	FIELDQC-EM08-EBMS	440-142130-1	Water	3/21/2016	MS	Stage 2B			X			
440-142130-1	FIELDQC-EM08-EBSD	440-142130-1	Water	3/21/2016	MSD	Stage 2B			X			
440-142130-1	FIELDQC-EM08-FB	440-142130-2	Water	3/21/2016	FB	Stage 2B	X	X	X			X
440-142130-1	BP-MW08-EM08	440-142130-3	Water	3/21/2016	NORM	Stage 2B	X	X	X			X
440-142130-1	BP-MW08-EM08MS	440-142130-3	Water	3/21/2016	MS	Stage 2B						X
440-142130-1	BP-MW08-EM08SD	440-142130-3	Water	3/21/2016	MSD	Stage 2B						X
440-142292-1/2	BH-01-EM08	440-142292-1	Water	3/22/2016	NORM	Stage 2B						
440-142292-1/2	MW-K5-EM08	440-142292-2	Water	3/22/2016	NORM	Stage 2B						
440-142292-1/2	BP-MW09-EM08	440-142292-3	Water	3/22/2016	NORM	Stage 2B	X	X	X			X
440-142292-1/2	BP-MW09-EM08MS	440-142292-3	Water	3/22/2016	MS	Stage 2B		X				
440-142292-1/2	BP-MW09-EM08SD	440-142292-3	Water	3/22/2016	MSD	Stage 2B		X				
440-142292-1/2	BP-MW01-EM08	440-142292-4	Water	3/22/2016	NORM	Stage 2B	X	X	X			X
440-142292-1/2	BP-MW01-EM08MS	440-142292-4	Water	3/22/2016	MS	Stage 2B		X				
440-142292-1/2	BP-MW01-EM08SD	440-142292-4	Water	3/22/2016	MSD	Stage 2B		X				
440-142292-1/2	BP-MW05-EM08	440-142292-5	Water	3/22/2016	NORM	Stage 2B	X	X	X			X
440-142292-1/2	BP-MW02-EM08	440-142292-6	Water	3/22/2016	NORM	Stage 2B	X	X	X			X
440-142292-1/2	BP-MW02-EM08MS	440-142292-6	Water	3/22/2016	MS	Stage 2B			X			

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-142292-1/2	BP-MW02-EM08SD	440-142292-6	Water	3/22/2016	MSD	Stage 2B			X			
440-142292-1/2	BP-MW02-EM08-FD	440-142292-7	Water	3/22/2016	FD	Stage 2B	X	X	X			X
440-142440-1/2	PC-98-EM08	440-142440-1	Water	3/23/2016	NORM	Stage 2B						
440-142440-1/2	PC-98-EM08MS	440-142440-1	Water	3/23/2016	MS	Stage 2B						
440-142440-1/2	PC-98-EM08SD	440-142440-1	Water	3/23/2016	MSD	Stage 2B						
440-142440-1/2	BP-MW07-EM08	440-142440-2	Water	3/23/2016	NORM	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW07-EM08MS	440-142440-2	Water	3/23/2016	MS	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW07-EM08SD	440-142440-2	Water	3/23/2016	MSD	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW03-EM08	440-142440-3	Water	3/23/2016	NORM	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW06-EM08	440-142440-4	Water	3/23/2016	NORM	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW04-EM08	440-142440-5	Water	3/23/2016	NORM	Stage 2B	X	X	X			X
440-142440-1/2	BP-MW04-EM08MS	440-142440-5	Water	3/23/2016	MS	Stage 2B						X
440-142440-1/2	440-142440-A-2 MSMS	440-142440-A-2 MS	Water	3/23/2016	MS	Stage 2B						
440-142440-1/2	440-142440-A-2 MSDSD	440-142440-A-2 MSD	Water	3/23/2016	MSD	Stage 2B						
440-142440-1/2	440-142440-J-2 MS ^10MS	440-142440-J-2MS	Water	3/23/2016	MS	Stage 2B						
440-142440-1/2	440-142440-J-2 MSD ^10SD	440-142440-J-2MSD	Water	3/23/2016	MSD	Stage 2B						
440-144883-1	BP-MW08-EM09	440-144883-1	Water	4/19/2016	NORM	Stage 2B	X	X	X			X
440-144883-1	BP-MW08-EM09MS	440-144883-1	Water	4/19/2016	MS	Stage 2B		X	X			
440-144883-1	BP-MW08-EM09SD	440-144883-1	Water	4/19/2016	MSD	Stage 2B		X	X			
440-144883-1	BP-MW04-EM09	440-144883-2	Water	4/19/2016	NORM	Stage 2B	X	X	X			X
440-144883-1	BP-MW02-EM09	440-144883-3	Water	4/19/2016	NORM	Stage 2B	X	X	X			X
440-144883-1	BP-MW02-EM09-FD	440-144883-4	Water	4/19/2016	FD	Stage 2B	X	X	X			X
440-144883-1	BP-MW02-EM09-FDMS	440-144883-4	Water	4/19/2016	MS	Stage 2B						
440-144883-1	BP-MW02-EM09-FDSD	440-144883-4	Water	4/19/2016	MSD	Stage 2B						
440-144883-1	BP-MW06-EM09	440-144883-5	Water	4/19/2016	NORM	Stage 2B	X	X	X			X
440-144883-1	PC-98R-EM09	440-144883-6	Water	4/19/2016	NORM	Stage 2B		X				
440-145019-1	BH-01-EM09	440-145019-1	Water	4/20/2016	NORM	Stage 2B		X				
440-145019-1	MW-K5-EM09	440-145019-2	Water	4/20/2016	NORM	Stage 2B		X				
440-145019-1	BP-MW01-EM09	440-145019-3	Water	4/20/2016	NORM	Stage 2B	X	X	X			X
440-145019-1	BP-MW03-EM09	440-145019-4	Water	4/20/2016	NORM	Stage 2B	X	X	X			X
440-145019-1	BP-MW05-EM09	440-145019-5	Water	4/20/2016	NORM	Stage 2B	X	X	X			X
440-145019-1	BP-MW07-EM09	440-145019-6	Water	4/20/2016	NORM	Stage 2B	X	X	X			X
440-145019-1	BP-MW07-EM09MS	440-145019-6	Water	4/20/2016	MS	Stage 2B	X	X	X			X
440-145019-1	BP-MW07-EM09SD	440-145019-6	Water	4/20/2016	MSD	Stage 2B	X	X	X			X
440-145019-1	BP-MW09-EM09	440-145019-7	Water	4/20/2016	NORM	Stage 2B	X	X	X			X
440-145019-1	FIELDQC-EM09-EB	440-145019-8	Water	4/20/2016	EB	Stage 2B	X	X	X			X
440-145019-1	FIELDQC-EM09-EBMS	440-145019-8	Water	4/20/2016	MS	Stage 2B						
440-145019-1	FIELDQC-EM09-EBSD	440-145019-8	Water	4/20/2016	MSD	Stage 2B						

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-145019-1	FIELDQC-EM09-FB	440-145019-9	Water	4/20/2016	FB	Stage 2B	X	X	X			X
440-147424-1	BP-IW01-EM09B	440-147424-1	Water	5/12/2016	NORM	Stage 2B						
440-147424-1	BP-IW02-EM09B	440-147424-2	Water	5/12/2016	NORM	Stage 2B						
440-147424-1	BP-IW03-EM09B	440-147424-3	Water	5/12/2016	NORM	Stage 2B						
440-147621-1	FIELD QC EM10-EB	440-147621-1	Water	5/16/2016	EB	Stage 4	X	X	X			X
440-147621-1	FIELD QC EM10-EBMS	440-147621-1	Water	5/16/2016	MS	Stage 4		X				
440-147621-1	FIELD QC EM10-EBSD	440-147621-1	Water	5/16/2016	MSD	Stage 4		X				
440-147621-1	FIELD QC-EM10-FB	440-147621-2	Water	5/16/2016	FB	Stage 4	X	X	X			X
440-147621-1	FIELD QC-EM10-FBMS	440-147621-2	Water	5/16/2016	MS	Stage 4			X			
440-147621-1	FIELD QC-EM10-FBSD	440-147621-2	Water	5/16/2016	MSD	Stage 4			X			
440-147621-1	BP-MW04-EM10	440-147621-3	Water	5/16/2016	NORM	Stage 4	X	X	X			X
440-147753-1/2	MW-K5-EM10	440-147753-1	Water	5/17/2016	NORM	Stage 4		X				
440-147753-1/2	BH-01-EM10	440-147753-2	Water	5/17/2016	NORM	Stage 4		X				
440-147753-1/2	PC-98R-EM10	440-147753-3	Water	5/17/2016	NORM	Stage 4		X				
440-147753-1/2	PC-98R-EM10MS	440-147753-3	Water	5/17/2016	MS	Stage 4		X				
440-147753-1/2	PC-98R-EM10SD	440-147753-3	Water	5/17/2016	MSD	Stage 4		X				
440-147753-1/2	BP-MW02-EM10	440-147753-4	Water	5/17/2016	NORM	Stage 4	X	X	X			X
440-147753-1/2	BP-MW02-EM10-FD	440-147753-5	Water	5/17/2016	FD	Stage 4	X	X	X			X
440-147753-1/2	BP-MW02-EM10-FDMS	440-147753-5	Water	5/17/2016	MS	Stage 4			X			
440-147753-1/2	BP-MW02-EM10-FDSD	440-147753-5	Water	5/17/2016	MSD	Stage 4			X			
440-147753-1/2	BP-MW08-EM10	440-147753-6	Water	5/17/2016	NORM	Stage 4	X	X	X			X
440-147753-1/2	BP-MW06-EM10	440-147753-7	Water	5/17/2016	NORM	Stage 4	X	X	X			X
440-147753-1/2	BP-MW06-EM10MS	440-147753-7	Water	5/17/2016	MS	Stage 4						
440-147753-1/2	BP-MW06-EM10SD	440-147753-7	Water	5/17/2016	MSD	Stage 4						
440-147905-1	BP-MW03-EM10	440-147905-1	Water	5/18/2016	NORM	Stage 4	X	X	X			X
440-147905-1	BP-MW07-EM10	440-147905-2	Water	5/18/2016	NORM	Stage 4	X	X	X			X
440-147905-1	BP-MW07-EM10MS	440-147905-2	Water	5/18/2016	MS	Stage 4	X	X	X			X
440-147905-1	BP-MW07-EM10SD	440-147905-2MSD	Water	5/18/2016	MSD	Stage 4	X	X	X			X
440-147905-1	BP-MW09-EM10	440-147905-3	Water	5/18/2016	NORM	Stage 4	X	X	X			X
440-147905-1	BP-MW05-EM10	440-147905-4	Water	5/18/2016	NORM	Stage 4	X	X	X			X
440-147905-1	BP-MW01-EM10	440-147905-5	Water	5/18/2016	NORM	Stage 4	X	X	X			X
440-154949-1	FIELDQC-EM11-FB	440-154949-1	Water	8/8/2016	FB	Stage 2B	X	X	X			X
440-154949-1	FIELDQC-EM11-FBMS	440-154949-1	Water	8/8/2016	MS	Stage 2B						
440-154949-1	FIELDQC-EM11-FBSD	440-154949-1	Water	8/8/2016	MSD	Stage 2B						
440-154949-1	FIELDQC-EM11-EB	440-154949-2	Water	8/8/2016	EB	Stage 2B	X	X	X			X
440-155093-1	BP-MW09-EM11	440-155093-1	Water	8/9/2016	NORM	Stage 2B	X	X	X			X
440-155093-1	BP-MW07-EM11	440-155093-2	Water	8/9/2016	NORM	Stage 2B	X	X	X			X
440-155093-1	BP-MW07-EM11MS	440-155093-2MS	Water	8/9/2016	MS	Stage 2B	X	X	X			X

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Stage	Total Metals by SW6010B	Dissolved Metals by SW6020	Hexavalent Chromium by SW7199	pH by SW9045	TOC by SW9060	Volatile Fatty Acids by VFA-IC
440-155093-1	BP-MW07-EM11SD	440-155093-2MSD	Water	8/9/2016	MSD	Stage 2B	X	X	X			X
440-155093-1	BP-MW02-EM11	440-155093-3	Water	8/9/2016	NORM	Stage 2B	X	X	X			X
440-155093-1	BP-MW02-EM11-FD	440-155093-4	Water	8/9/2016	FD	Stage 2B	X	X	X			X
440-155093-1	BP-MW02-EM11-FDMS	440-155093-4	Water	8/9/2016	MS	Stage 2B						
440-155093-1	BP-MW02-EM11-FDSD	440-155093-4	Water	8/9/2016	MSD	Stage 2B						
440-155093-1	BP-MW04-EM11	440-155093-5	Water	8/9/2016	NORM	Stage 2B	X	X	X			X
440-155093-1	BP-MW08-EM11	440-155093-6	Water	8/9/2016	NORM	Stage 2B	X	X	X			X
440-155280-1	BP-MW06-EM11	440-155280-1	Water	8/10/2016	NORM	Stage 2B	X	X	X			X
440-155280-1	BP-MW06-EM11MS	440-155280-1	Water	8/10/2016	MS	Stage 2B		X				
440-155280-1	BP-MW06-EM11SD	440-155280-1	Water	8/10/2016	MSD	Stage 2B		X				
440-155280-1	BP-MW03-EM11	440-155280-2	Water	8/10/2016	NORM	Stage 2B	X	X	X			X
440-155280-1	BP-MW03-EM11MS	440-155280-2	Water	8/10/2016	MS	Stage 2B			X			
440-155280-1	BP-MW03-EM11SD	440-155280-2	Water	8/10/2016	MSD	Stage 2B			X			
440-155280-1	BP-MW05-EM11	440-155280-3	Water	8/10/2016	NORM	Stage 2B	X	X	X			X
440-155280-1	BP-MW01-EM11	440-155280-4	Water	8/10/2016	NORM	Stage 2B	X	X	X			X
440-155280-1	BP-MW01-EM11MS	440-155280-4	Water	8/10/2016	MS	Stage 2B	X					X
440-155280-1	BP-MW01-EM11SD	440-155280-4	Water	8/10/2016	MSD	Stage 2B	X					X
440-155280-1	BP-IW-02-EM11	440-155280-5	Water	8/10/2016	NORM	Stage 2B						
440-155522-1	BH-01-EM11	440-155522-1	Water	8/11/2016	NORM	Stage 2B		X				
440-155522-1	PC-98R-EM11	440-155522-2	Water	8/11/2016	NORM	Stage 2B		X				
440-155522-1	MW-K5-EM11	440-155522-3	Water	8/11/2016	NORM	Stage 2B		X				
440-155522-1	BP-IW01-EM11	440-155522-4	Water	8/11/2016	NORM	Stage 2B						
440-155522-1	BP-IW01-EM11MS	440-155522-4	Water	8/11/2016	MS	Stage 2B						
440-155522-1	BP-IW01-EM11SD	440-155522-4	Water	8/11/2016	MSD	Stage 2B						
440-155522-1	BP-IW03-EM11	440-155522-5	Water	8/11/2016	NORM	Stage 2B						

Table 3 Samples Validated

Matrix	Method	Parameters	Samples Validated
Groundwater	EPA 300.0	Dissolved Nitrate as N	6
	EPA 300.0	Bromide	76
	EPA 300.0	Chloride	81
	EPA 300.0	Nitrate as N	151
	EPA 300.0	Nitrite as N	84
	EPA 300.0	Sulfate	120
	EPA 300.1	Chlorate	115
	EPA 300.1	Chlorite	114
	EPA 314.0	Perchlorate	152
	EPA 351.2	Total Kjeldahl Nitrogen	83
	EPA 365.3	Total Phosphorus	86
	NTOTAL-CALC	Nitrogen, Total	86
	RSK175	Methane	83
	SM2320B	Alkalinity , Bicarbonate, Carbonate, Hydroxide	76
	SM2340C	Hardness as calcium carbonate	70
	SM2540C	TDS	89
	SM5220D	COD	56
	SM5310B	TOC	150
	SW-846 6010B	Dissolved Metals	85
	SW-846 6010B	Total Iron	85
	SW-846 6010B	Total Manganese	76
	SW-846 6020	Dissolved Antimony, Arsenic, Selenium, Thallium	85
	SW-846 7199	Chromium, hexavalent	76
	VFA-IC	Volatile Fatty Acids	81
Soil	EPA 300	Chloride, Nitrate, Sulfate	1
	EPA 314.0	Perchlorate	2
	SM2320	Alkalinity , Bicarbonate, Carbonate (leached)	1
	SM2540C	TDS (leached)	1
	SW-846 6010B	Calcium, Magnesium, Potassium, Sodium (leached)	1
	SW-846 6010B	Calcium	9
	SW-846 6010B	Arsenic, Chromium, Manganese	1
	SW-846 6010B	Iron	10
	SW-846 7199	Chromium, hexavalent	1
	SW-846 9045	pH	1
	SW-846 9060	TOC	10

Table 3 Samples Validated

Matrix	Method	Parameters	Samples Validated
Equipment and Field Blanks	EPA 300.0	Bromide	14
	EPA 300.0	Chloride	16
	EPA 300.0	Nitrate as N	18
	EPA 300.0	Nitrite as N	18
	EPA 300.0	Sulfate	14
	EPA 300.1	Chlorate	18
	EPA 300.1	Chlorite	18
	EPA 314.0	Perchlorate	20
	EPA 351.2	Total Kjeldahl Nitrogen	18
	EPA 365.3	Total Phosphorus	18
	NTOTAL-CALC	Nitrogen, Total	18
	RSK175	Methane	14
	SM2320B	Alkalinity , Bicarbonate, Carbonate, Hydroxide	14
	SM2340C	Hardness as calcium carbonate	12
	SM2540C	TDS	14
	SM5220D	COD	14
	SM5310B	TOC	18
	SW-846 6010B	Dissolved Metals	14
	SW-846 6010B	Total Iron	16
	SW-846 6010B	Total Manganese	14
	SW-846 6020	Dissolved Antimony, Arsenic, Selenium, Thallium	14
	SW-846 7199	Chromium, hexavalent	14
	VFA-IC	Volatile Fatty Acids	16

Table 4 Validation Qualifiers and Definitions

Validation Qualifier	Definition
J-	The result is an estimated quantity, but the result may be biased low.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Table 5 **Validation Checks and Stages**

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
Documentation identifies the laboratory receiving and conducting analyses, and includes documentation for all samples submitted by the project or requester for analyses.	X	X	X
Requested analytical methods were performed and the analysis dates are present.	X	X	X
Requested target analyte results are reported along with the original laboratory data qualifiers and data qualifier definitions for each reported result (and the uncertainty of each result and clear indication of the type of uncertainty reported if required, e.g., for radiochemical analyses).	X	X	X
Requested target analyte result units are reported (along with their associated uncertainty units if required, e.g., for radiochemical analyses).	X	X	X
Requested reporting limits for all samples are present and results at and below the requested (required) reporting limits are clearly identified (including sample detection limits if required).	X	X	X
Sampling dates (including times if needed), date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH and temperature) are documented	X	X	X
For radiochemical analyses, the sample-specific critical values (sometimes called "critical level," "decision level" or "detection threshold") and sample specific minimum detectable value, activity or concentration for all samples are reported and results at and below the requested (required) critical values are clearly identified	X	X	X
For radiochemical analyses, the chemical yield (if applicable to the method) and reference date and time (especially for short lived isotopes) is reported for all samples (as appropriate).	X	X	X
Sample results are evaluated by comparing sample conditions upon receipt at the laboratory (e.g., preservation checks) and sample characteristics (e.g., percent moisture) to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.	X	X	X
Requested methods (handling, preparation, cleanup, and analytical) are performed	X	X	X
Method dates (including dates, times and duration of analysis for radiation counting measurements and other methods, if needed) for handling (e.g., Toxicity Characteristic Leaching Procedure), preparation, cleanup and analysis are present, as appropriate.	X	X	X
Sample-related QC data and QC acceptance criteria (e.g., method blanks, surrogate recoveries, deuterated monitoring compounds (DMC) recoveries, laboratory control sample (LCS) recoveries, duplicate analyses, matrix spike and matrix spike duplicate recoveries, serial dilutions, post digestion spikes, standard reference materials) are provided and linked to the reported field samples (including the field quality control samples such as trip and equipment blanks).	X	X	X
Requested spike analytes or compounds (e.g., surrogate, DMCs, LCS spikes, post digestion spikes) have been added, as appropriate.	X	X	X
Sample holding times (from sampling date to preparation and preparation to analysis) are evaluated.	X	X	X

Table 5 **Validation Checks and Stages**

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
Frequency of QC samples is checked for appropriateness (e.g., one LCS per twenty samples in a preparation batch).	X	X	X
Sample results are evaluated by comparing holding times and sample-related QC data to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract	X	X	X
Initial calibration data (e.g., initial calibration standards, initial calibration verification [ICV] standards, initial calibration blanks [ICBs]) are provided for all requested analytes and linked to field samples reported. For each initial calibration, the calibration type used is present along with the initial calibration equation used including any weighting factor(s) applied and the associated correlation coefficients, as appropriate. Recalculations of the standard concentrations using the initial calibration curve are present, along with their associated percent recoveries, as appropriate (e.g., if required by the project, method, or contract). For the ICV standard, the associated percent recovery (or percent difference, as appropriate) is present.		X	X
Appropriate number and concentration of initial calibration standards are present.		X	X
Continuing calibration data (e.g., continuing calibration verification [CCV] standards and continuing calibration blanks [CCBs]) are provided for all requested analytes and linked to field samples reported, as appropriate. For the CCV standard(s), the associated percent recoveries (or percent differences, as appropriate) are present.		X	X
Reported samples are bracketed by CCV standards and CCBs standards as appropriate.		X	X
Method specific instrument performance checks are present as appropriate (e.g., tunes for mass spectrometry methods, DDT/Endrin breakdown checks for pesticides and aroclors, instrument blanks and interference checks for ICP methods).		X	X
Frequency of instrument QC samples is checked for appropriateness (e.g., gas chromatography-mass spectroscopy [GC-MS] tunes have been run every 12 hours).		X	X
Sample results are evaluated by comparing instrument-related QC data to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.		X	X
Instrument response data (e.g., GC peak areas, ICP corrected intensities) are reported for requested analytes, surrogates, internal standards, and DMCs for all requested field samples, matrix spikes, matrix spike duplicates, LCS, and method blanks as well as calibration data and instrument QC checks (e.g., tunes, DDT/Endrin breakdowns, interelement correction factors, and Florisil cartridge checks).			X
Reported target analyte instrument responses are associated with appropriate internal standard analyte(s) for each (or selected) analyte(s) (for methods using internal standard for calibration).			X

Table 5 **Validation Checks and Stages**

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
Fit and appropriateness of the initial calibration curve used or required (e.g., mean calibration factor, regression analysis [linear or non-linear, with or without weighting factors, with or without forcing]) is checked with recalculation of the initial calibration curve for each (or selected) analyte(s) from the instrument response.			X
Comparison of instrument response to the minimum response requirements for each (or selected) analyte(s).			X
Recalculation of each (or selected) opening and closing CCV (and CCB) response from the peak data reported for each (or selected) analyte(s) from the instrument response, as appropriate.			X
Compliance check of recalculated opening and/or closing CCV (and CCB) response to recalculated initial calibration response for each (or selected) analyte(s).			X
Recalculation of percent ratios for each (or selected) tune from the instrument response, as appropriate.			X
Compliance check of recalculated percent ratio for each (or selected) tune from the instrument response.			X
Recalculation of each (or selected) instrument performance check (e.g., DDT/Endrin breakdown for pesticide analysis, instrument blanks, interference checks) from the instrument response.			X
Recalculation and compliance check of retention time windows (for chromatographic methods) for each (or selected) analyte(s) from the laboratory reported retention times.			X
Recalculation of reported results for each reported (or selected) target analyte(s) from the instrument response.			X
Recalculation of each (or selected) reported spike recovery (surrogate recoveries, DMC recoveries, LCS recoveries, duplicate analyses, matrix spike and matrix spike duplicate recoveries, serial dilutions, post digestion spikes, standard reference materials etc.) from the instrument response.			X
Each (or selected) sample result(s) and spike recovery(ies) are evaluated by comparing the recalculated numbers to the laboratory reported numbers according to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.			X
All required instrument outputs (e.g., chromatograms, mass spectra, atomic emission spectra, instrument background corrections, and interference corrections) for evaluating sample and instrument performance are present.			X
Sample results are evaluated by checking each (or selected) instrument output (e.g., chromatograms, mass spectra, atomic emission spectra data, instrument background corrections, interference corrections) for correct identification and quantitation of analytes (e.g., peak integrations, use of appropriate internal standards for quantitation, elution order of analytes, and interferences).			X
Each (or selected) instrument's output(s) is evaluated for confirmation of non-detected or tentatively identified analytes.			X

Table 6 Reason Codes

Reason Code	Description of Qualification
a	Qualified due to low abundance (radiochemical activity)
be	Qualified due to equipment blank contamination
bf	Qualified due to field blank contamination
bl	Qualified due to lab blank contamination
bt	Qualified due to trip blank contamination
bp	Qualified due to pump blank contamination (for wells without dedicated pumps)
br	Qualified due to filter blank contamination (aqueous hexavalent chromium and dissolved sample fractions)
c	Qualified due to calibration problems
cp	Qualified due to insufficient ingrowth (radiochemical only)
dc	Duel column confirmation % difference exceeded
e	Sample concentration exceeded the calibration range
fd	Qualified due to field duplicate imprecision
h	Qualified due to holding time exceedance
i	Qualified due to internal standard areas or retention times
k	Qualified as Estimated Maximum Possible Concentrations (dioxins and PCB congeners)
l	Qualified due to LCS recoveries
ld	Qualified due to lab duplicate imprecision (matrix duplicate, MSD, LCSD)
m	Qualified due to matrix spike recoveries
nb	Qualified due to negative lab blank contamination (nondetect results only)
nd	Qualified due to non-detected target analyte
o	Other
p	Qualified as a false positive due to contamination during shipping
pH	Sample preservation not within acceptance range
q	Qualified due to quantitation problem
s	Qualified due to surrogate recoveries
sd	Serial dilution did not meet control criteria
sp	Detected value reported between MDL/SQL and RL/PQL
st	Sample receipt temperature exceeded
t	Qualified due to elevated helium tracer concentrations
vh	Headspace detected in aqueous sample containers submitted for volatile analysis
x	Qualified due to low % solids
z	Qualified due to interference check sample results

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-107257-2	MW-K5-201504	4/15/2015	SW6010B	Dissolved	Molybdenum	0.085	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-107257-2	MW-K5-201504	4/15/2015	SW6010B	Dissolved	Tin	0.014	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-107289-1	BHW-1-0-201504	4/14/2015	E314.0	N/A	Perchlorate	4.9	mg/kg		0.0095	0.52	J	fd	FD
440-107289-1	BHW-1-0-201504-FD	4/14/2015	E314.0	N/A	Perchlorate	7.9	mg/kg		0.0095	0.49	J	fd	FD
440-108121-1	BHW-1-20150427	4/27/2015	E300.0	N/A	Bromide	2.9	mg/L		0.25	0.5	J-	m	Matrix Spike %Recovery
440-108121-1	PC-98R-20150427	4/27/2015	E300.0	N/A	Bromide	2.7	mg/L		0.25	0.5	J-	m	Matrix Spike %Recovery
440-108121-1	BHW-1-20150427	4/27/2015	E300.0	N/A	Nitrate	8.3	mg/L		0.055	5.5	J-	m	Matrix Spike %Recovery
440-108121-1	PC-98R-20150427	4/27/2015	E300.0	N/A	Nitrate	10	mg/L		0.055	5.5	J-	m	Matrix Spike %Recovery
440-108121-1	BHW-1-20150427	4/27/2015	SW6010B	Dissolved	Aluminum	0.16	mg/L	J	0.025	0.25	J	sp	Detect < PQL
440-108121-1	PC-98R-20150427	4/27/2015	SW6010B	Dissolved	Aluminum	0.13	mg/L	J	0.025	0.25	J	sp	Detect < PQL
440-108121-1	BHW-1-20150427	4/27/2015	SW6010B	Dissolved	Lead	0.018	mg/L	J	0.0025	0.025	J	sp	Detect < PQL
440-108121-1	BHW-1-20150427	4/27/2015	SW6010B	Dissolved	Molybdenum	0.074	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-108121-1	PC-98R-20150427	4/27/2015	SW6010B	Dissolved	Molybdenum	0.063	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-108121-1	BHW-1-20150427	4/27/2015	SW7199	N/A	Chromium VI	0.25	ug/L	UH	0.25	2	UJ	h	Holding Time
440-108121-1	PC-98R-20150427	4/27/2015	SW7199	N/A	Chromium VI	21	ug/L	H	0.25	2	J-	h	Holding Time
440-108121-1	BHW-1-20150427	4/27/2015	VFA-IC	N/A	Formic-acid	0.17	mg/L	J	0.11	1	J	sp	Detect < PQL
440-119195-1	BP-MW08-B	8/24/2015	SW6010B	Total	Calcium	3000	mg/kg	BF2	13	25	J	ld	Matrix Spike RPD
440-119195-1	BP-MW08-B	8/24/2015	SW6010B	Total	Iron	13000	mg/kg	F2	5	10	J	ld	Matrix Spike RPD
440-122031-1	BP-MW02-EMBL	9/21/2015	SW6010B	Dissolved	Aluminum	0.04	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-122031-1	BP-MW08-EMBL	9/21/2015	SW6010B	Dissolved	Aluminum	0.046	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-122031-1	BP-MW02-EMBL	9/21/2015	SW6010B	Dissolved	Phosphorus	0.03	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-122031-1	BP-MW02-EMBL	9/21/2015	SW6010B	Dissolved	Tin	0.019	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-122031-1	BP-MW08-EMBL	9/21/2015	SW6010B	Dissolved	Tin	0.019	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-122031-1	BP-MW02-EMBL	9/21/2015	SW6010B	Dissolved	Zinc	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-122031-1	BP-MW02-EMBL	9/21/2015	VFA-IC	N/A	Formic-acid	0.22	mg/L	UF1	0.11	2	UJ	m	Matrix Spike %Recovery
440-122031-1	BP-MW02-EMBL	9/21/2015	VFA-IC	N/A	Lactic acid	0.28	mg/L	UF1	0.14	2	R	m	Matrix Spike %Recovery
440-122031-1	BP-MW02-EMBL	9/21/2015	VFA-IC	N/A	n-Butyric Acid	0.32	mg/L	UF1	0.16	2	UJ	m	Matrix Spike %Recovery
440-122031-1	BP-MW02-EMBL	9/21/2015	VFA-IC	N/A	Pyruvic Acid	1.6	mg/L	UF1	0.08	20	R	m	Matrix Spike %Recovery
440-122031-1	BP-MW08-EMBL	9/21/2015	VFA-IC	N/A	Pyruvic Acid	1.6	mg/L	UF1	0.08	20	R	m	Matrix Spike %Recovery
440-122171-1	BP-MW05-EMBL	9/22/2015	E300.0	N/A	Bromide	3.7	mg/L	J	0.25	5	J	sp	Detect < PQL
440-122171-1	BH-1-EMBL	9/22/2015	E300.0	N/A	Nitrate	20	mg/L	JF1	0.055	22	J	m,sp	Matrix Spike %Recovery, Detect < PQL
440-122171-1	MW-K5-EMBL	9/22/2015	E300.1B	N/A	Chlorate	38000	ug/L		10	10000	J-	pH	Preservation
440-122171-1	MW-K5-EMBL	9/22/2015	E300.1B	N/A	Chlorite	500	ug/L	U	10	1000	R	pH	Preservation
440-122171-1	BP-MW05-EMBL	9/22/2015	E365.3	N/A	Phosphorus	0.029	mg/L	J	0.025	0.05	J	be,sp	EB, Detect < PQL
440-122171-1	FIELD QC-EMBL-EB	9/22/2015	E365.3	N/A	Phosphorus	0.043	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-122171-1	FIELD QC-EMBL-EB	9/22/2015	RSK175	N/A	Methane	0.00046	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-122171-1	BP-MW05-EMBL-FD	9/22/2015	SW6010B	Dissolved	Aluminum	0.14	mg/L	J	0.025	0.25	J	sp	Detect < PQL
440-122171-1	BP-MW01-EMBL	9/22/2015	SW6010B	Dissolved	Molybdenum	0.094	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122171-1	BP-MW05-EMBL	9/22/2015	SW6010B	Dissolved	Molybdenum	0.08	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122171-1	BP-MW05-EMBL-FD	9/22/2015	SW6010B	Dissolved	Molybdenum	0.083	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122171-1	FIELD QC-EMBL-EB	9/22/2015	SW6010B	Dissolved	Sodium	0.3	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-122171-1	BP-MW01-EMBL	9/22/2015	SW6010B	Dissolved	Tin	0.062	mg/L	J	0.012	0.5	J	sp	Detect < PQL
440-122317-1	FIELDQC-EMBL-FB	9/23/2015	E300.0	N/A	Chloride	0.3	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-122317-1	BP-MW06-EMBL	9/23/2015	E365.3	N/A	Phosphorus	0.069	mg/L		0.025	0.05	J+	be	EB
440-122317-1	BP-MW07-EMBL	9/23/2015	E365.3	N/A	Phosphorus	0.041	mg/L	J	0.025	0.05	J	be,sp	EB, Detect < PQL
440-122317-1	BP-MW07-EMBL	9/23/2015	SW6010B	Dissolved	Aluminum	0.19	mg/L	J	0.025	0.25	J	sp	Detect < PQL
440-122317-1	BP-IW02-EMBL	9/23/2015	SW6010B	Dissolved	Chromium	0.0081	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-122317-1	BP-MW09-EMBL	9/23/2015	SW6010B	Dissolved	Iron	0.064	mg/L	JB	0.01	0.08	J	bl	Lab Blank
440-122317-1	BP-IW01-EMBL	9/23/2015	SW6010B	Dissolved	Molybdenum	0.09	mg/L	J	0.01	0.1	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-122317-1	BP-IW03-EMBL	9/23/2015	SW6010B	Dissolved	Molybdenum	0.065	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122317-1	BP-MW06-EMBL	9/23/2015	SW6010B	Dissolved	Molybdenum	0.067	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122317-1	BP-MW07-EMBL	9/23/2015	SW6010B	Dissolved	Molybdenum	0.066	mg/L	J	0.01	0.1	J	sp	Detect < PQL
440-122317-1	BP-IW02-EMBL	9/23/2015	SW6010B	Dissolved	Phosphorus	0.046	mg/L	J	0.02	0.08	J	sp	Detect < PQL
440-122317-1	BP-IW02-EMBL	9/23/2015	SW6010B	Dissolved	Tin	0.025	mg/L	J	0.012	0.2	J	sp	Detect < PQL
440-122317-1	BP-MW09-EMBL	9/23/2015	SW6010B	Dissolved	Tin	0.035	mg/L	J	0.012	0.2	J	sp	Detect < PQL
440-122317-1	BP-IW03-EMBL	9/23/2015	VFA-IC	N/A	Acetic acid	0.15	mg/L	UF1	0.15	1	UJ	m	Matrix Spike %Recovery
440-122317-1	BP-IW03-EMBL	9/23/2015	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-122317-1	BP-IW03-EMBL	9/23/2015	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	R	m	Matrix Spike %Recovery
440-122317-1	BP-IW03-EMBL	9/23/2015	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-122317-1	BP-IW03-EMBL	9/23/2015	VFA-IC	N/A	Propionic acid	0.17	mg/L	UF1	0.17	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	E300.0	N/A	Nitrate	7.6	mg/L		0.055	2.2	J-	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	E300.0	N/A	Nitrate	7.5	mg/L	F1	0.055	2.2	J-	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	E351.2	N/A	TKN	0.1	mg/L	U	0.1	0.2	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	E351.2	N/A	TKN	0.1	mg/L	UF1	0.1	0.2	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	SW6010B	Dissolved	Molybdenum	0.069	mg/L		0.01	0.02	J+	bl	Lab Blank
440-122387-1	BP-MW04-EMBL	9/24/2015	SW6010B	Dissolved	Molybdenum	0.074	mg/L		0.01	0.02	J+	bl	Lab Blank
440-122387-1	BP-MW04-EMBL	9/24/2015	SW6020	Dissolved	Antimony	0.9	ug/L	J	0.5	2	J	bl,sp	Lab Blank, Detect < PQL
440-122387-1	BP-MW03-EMBL	9/24/2015	VFA-IC	N/A	Acetic acid	0.15	mg/L	U	0.15	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	VFA-IC	N/A	Acetic acid	0.15	mg/L	UF1	0.15	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	U	0.16	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	VFA-IC	N/A	Propionic acid	0.17	mg/L	U	0.17	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	VFA-IC	N/A	Propionic acid	0.17	mg/L	UF1	0.17	1	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW03-EMBL	9/24/2015	VFA-IC	N/A	Pyruvic Acid	4	mg/L	U^*	0.08	50	UJ	m	Matrix Spike %Recovery
440-122387-1	BP-MW04-EMBL	9/24/2015	VFA-IC	N/A	Pyruvic Acid	4	mg/L	UF1*^	0.08	50	UJ	m	Matrix Spike %Recovery
440-130250-2	BP-MW01-EM01	12/8/2015	E300.0	Dissolved	Nitrate	22	mg/L	H	0.055	1.1	J-	h	Holding Time
440-130250-2	BP-MW03-EM01	12/8/2015	E300.0	Dissolved	Nitrate	0.55	mg/L	UH	0.055	1.1	UJ	h	Holding Time
440-130250-2	BP-MW05-EM01	12/8/2015	E300.0	Dissolved	Nitrate	4.1	mg/L	H	0.055	1.1	J-	h	Holding Time
440-130250-2	BP-MW05-EM01-FD	12/8/2015	E300.0	Dissolved	Nitrate	4	mg/L	H	0.055	1.1	J-	h	Holding Time
440-131167-1	FIELDQC-EM02-EB	12/15/2015	E351.2	N/A	TKN	0.19	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-131167-1	BP-MW09-EM02	12/15/2015	SW6010B	Total	Iron	0.032	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-131167-2	BP-MW06-EM02	12/15/2015	E300.0	N/A	Nitrate	1.6	mg/L	J	0.055	2.2	J	sp	Detect < PQL
440-131337-1	BP-MW03-EM02	12/16/2015	E351.2	N/A	TKN	0.64	mg/L		0.1	0.2	J+	be	EB
440-131337-1	BP-MW07-EM02	12/16/2015	E351.2	N/A	TKN	0.52	mg/L		0.1	0.2	J+	be	EB
440-131337-1	BP-MW05-EM02	12/16/2015	E365.3	N/A	Phosphorus	0.031	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-131337-1	BP-MW07-EM02	12/16/2015	E365.3	N/A	Phosphorus	0.13	mg/L	F1	0.025	0.05	J-	m	Matrix Spike %Recovery
440-131433-1	BP-MW08-EM02	12/17/2015	E300.0	N/A	Nitrate	7.8	mg/L	F2 F1	0.055	2.2	J	m,ld	Matrix Spike %Recovery and RPD
440-131951-1	BP-MW04-EM03	12/22/2015	E300.0	N/A	Nitrate	0.85	mg/L	J	0.055	1.1	J	sp	Detect < PQL
440-132568-1	BP-MW07-EM04	12/29/2015	E351.2	N/A	TKN	0.99	mg/L	J	0.1	1	J	sp	Detect < PQL
440-132568-1	BP-MW01-EM04	12/29/2015	E365.3	N/A	Phosphorus	0.025	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-132568-1	FIELD QC EM04-FB	12/29/2015	E365.3	N/A	Phosphorus	0.025	mg/L	U	0.025	0.05	R	pH	Preservation
440-132568-1	FIELD QC-EM04-EB	12/29/2015	E365.3	N/A	Phosphorus	0.025	mg/L	U	0.025	0.05	R	pH	Preservation
440-132568-1	FIELD QC EM04-FB	12/29/2015	NTOTAL	N/A	Total Nitrogen	0.5	mg/L	U	0.5	0.5	R	pH	Preservation
440-132568-1	FIELD QC-EM04-EB	12/29/2015	NTOTAL	N/A	Total Nitrogen	0.5	mg/L	U	0.5	0.5	R	pH	Preservation
440-132568-1	BP-MW03-EM04	12/29/2015	SW6010B	Total	Iron	0.21	mg/L	B	0.01	0.04	J+	bl,be	Lab Blank, EB
440-132568-1	BP-MW05-EM04	12/29/2015	SW6010B	Total	Iron	0.31	mg/L	B	0.01	0.04	J+	bl,be	Lab Blank, EB
440-132568-1	BP-MW07-EM04	12/29/2015	SW6010B	Total	Iron	0.44	mg/L	B	0.01	0.04	J+	bl,be	Lab Blank, EB
440-132568-1	BP-MW09-EM04	12/29/2015	SW6010B	Total	Iron	0.023	mg/L	JB	0.01	0.04	J	bl,be	Lab Blank, EB

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-132568-1	FIELD QC-EM04-EB	12/29/2015	SW6010B	Total	Iron	0.1	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-132568-1	BP-MW07-EM04	12/29/2015	VFA-IC	N/A	Lactic acid	0.7	mg/L	UF1	0.14	5	UJ	m	Matrix Spike %Recovery
440-132568-1	BP-MW07-EM04	12/29/2015	VFA-IC	N/A	Propionic acid	43	mg/L	F1	0.17	5	J+	m	Matrix Spike %Recovery
440-132568-2	FIELD QC-EM04-EB	12/29/2015	E314.0	N/A	Perchlorate	3.9	ug/L	J	0.95	4	J	sp	Detect < PQL
440-132568-2	BP-MW07-EM04	12/29/2015	SM5310B	N/A	TOC	150	mg/L	F1	0.65	10	J-	m	Matrix Spike %Recovery
440-134828-2	BP-MW07-EM05	1/12/2016	E314.0	N/A	Perchlorate	46	ug/L	F1	0.95	8	J-	m	Matrix Spike %Recovery
440-134828-2	BP-MW07-EM05-FD	1/12/2016	E314.0	N/A	Perchlorate	47	ug/L		0.95	8	J-	m	Matrix Spike %Recovery
440-134828-2	BP-MW07-EM05	1/12/2016	SM5310B	N/A	TOC	430	mg/L		0.65	50	J-	pH	Preservation
440-134828-2	BP-MW07-EM05-FD	1/12/2016	SM5310B	N/A	TOC	430	mg/L		0.65	50	J-	pH	Preservation
440-135045-1	BP-MW09-EM05	1/13/2016	SW6010B	Total	Iron	0.033	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	E300.0	N/A	Chloride	0.34	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-FB	1/25/2016	E300.0	N/A	Chloride	0.33	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-FB	1/25/2016	E300.0	N/A	Nitrate	0.066	mg/L	J	0.055	0.11	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	RSK175	N/A	Methane	0.00037	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-FB	1/25/2016	SM2540C	N/A	TDS	6	mg/L	J	5	10	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	SW6010B	Dissolved	Aluminum	0.045	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	SW6010B	Dissolved	Iron	0.027	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	SW6010B	Dissolved	Silicon	0.046	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-136058-1	FIELDQC-EM06-EB	1/25/2016	SW6010B	Dissolved	Sodium	0.43	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-136168-1	BP-MW07-EM06	1/26/2016	E300.0	N/A	Sulfate	20	mg/L		0.25	5	J-	m	Matrix Spike %Recovery
440-136168-1	BP-MW06-EM06	1/26/2016	RSK175	N/A	Methane	0.00066	mg/L	J	0.00025	0.00099	J	be,sp	EB, Detect < PQL
440-136168-1	BP-MW02-EM06	1/26/2016	SM5220D	N/A	COD	20	mg/L	J	10	40	J	sp	Detect < PQL
440-136168-1	BP-MW02-EM06	1/26/2016	SW6010B	Total	Iron	0.044	mg/L		0.01	0.04	J+	be	EB
440-136168-1	BP-MW02-EM06-FD	1/26/2016	SW6010B	Total	Iron	0.042	mg/L		0.01	0.04	J+	be	EB
440-136168-1	BP-MW05-EM06	1/26/2016	SW6010B	Total	Iron	0.063	mg/L		0.01	0.04	J+	be	EB
440-136168-1	BP-MW06-EM06	1/26/2016	SW6010B	Total	Iron	0.44	mg/L		0.01	0.04	J+	be	EB
440-136168-1	BP-MW09-EM06	1/26/2016	SW6010B	Total	Iron	0.012	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-136168-1	BP-MW05-EM06	1/26/2016	SW6010B	Total	Manganese	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-136168-1	BP-MW02-EM06-FD	1/26/2016	SW6010B	Dissolved	Aluminum	0.22	mg/L	J	0.025	0.25	J	be,sp	EB, Detect < PQL
440-136168-1	BP-MW06-EM06	1/26/2016	SW6010B	Dissolved	Chromium	0.0048	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-136168-1	BP-MW02-EM06	1/26/2016	SW6010B	Dissolved	Iron	0.01	mg/L	U	0.01	0.04	UJ	fd	FD
440-136168-1	BP-MW02-EM06-FD	1/26/2016	SW6010B	Dissolved	Iron	0.2	mg/L		0.01	0.04	J	be,fd	EB, FD
440-136168-1	BP-MW05-EM06	1/26/2016	SW6010B	Dissolved	Iron	0.011	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-136168-1	BP-MW06-EM06	1/26/2016	SW6010B	Dissolved	Iron	0.24	mg/L		0.01	0.04	J+	be	EB
440-136168-1	BP-MW02-EM06-FD	1/26/2016	SW6010B	Dissolved	Zinc	0.017	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-136168-1	BP-MW07-EM06	1/26/2016	SW6020	Dissolved	Antimony	1.6	ug/L	J	0.5	2	J	sp	Detect < PQL
440-136168-1	BP-MW09-EM06	1/26/2016	SW6020	Dissolved	Antimony	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-136168-1	BP-MW07-EM06	1/26/2016	SW6020	Dissolved	Selenium	1.8	ug/L	J	0.5	2	J	sp	Detect < PQL
440-136168-1	BP-MW05-EM06	1/26/2016	VFA-IC	N/A	Acetic acid	0.25	mg/L	J	0.15	1	J	sp	Detect < PQL
440-136168-2	BP-MW07-EM06	1/26/2016	SM5310B	N/A	TOC	500	mg/L		0.65	50	J-	pH	Preservation
440-136337-1	BP-MW03-EM06	1/27/2016	E300.0	N/A	Bromide	4.2	mg/L	J	0.25	5	J	sp	Detect < PQL
440-136337-1	BP-MW03-EM06	1/27/2016	E300.0	N/A	Nitrate	0.57	mg/L	J	0.055	1.1	J	be,sp	EB, Detect < PQL
440-136337-1	BP-MW03-EM06	1/27/2016	E300.1B	N/A	Chlorite	100	ug/L	UH	10	200	UJ	h	Holding Time
440-136337-1	BP-MW04-EM06	1/27/2016	E300.1B	N/A	Chlorite	100	ug/L	UH	10	200	UJ	h	Holding Time
440-136337-1	BP-MW08-EM06	1/27/2016	E300.1B	N/A	Chlorite	100	ug/L	UH	10	200	UJ	h	Holding Time
440-136337-1	BP-MW08-EM06	1/27/2016	E351.2	N/A	TKN	0.1	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-136337-1	BP-MW01-EM06	1/27/2016	E365.3	N/A	Phosphorus	0.025	mg/L	UF1F2	0.025	0.05	UJ	m	Matrix Spike %Recovery
440-136337-1	BP-MW03-EM06	1/27/2016	SM5220D	N/A	COD	50	mg/L	U	10	100	R	pH	Preservation
440-136337-1	BP-MW01-EM06	1/27/2016	SW6010B	Total	Iron	0.14	mg/L		0.01	0.04	J+	be	EB

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-136337-1	BP-MW03-EM06	1/27/2016	SW6010B	Total	Iron	0.51	mg/L		0.01	0.04	J+	be	EB
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Total	Iron	0.1	mg/L		0.01	0.04	J+	be	EB
440-136337-1	BP-MW08-EM06	1/27/2016	SW6010B	Total	Iron	0.53	mg/L		0.01	0.04	J+	be	EB
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Dissolved	Cobalt	0.0097	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-136337-1	BP-MW01-EM06	1/27/2016	SW6010B	Dissolved	Copper	0.0068	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Dissolved	Copper	0.0054	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-136337-1	BP-MW01-EM06	1/27/2016	SW6010B	Dissolved	Iron	0.024	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-136337-1	BP-MW08-EM06	1/27/2016	SW6010B	Dissolved	Iron	0.076	mg/L		0.01	0.04	J+	be	EB
440-136337-1	BP-MW03-EM06	1/27/2016	SW6010B	Dissolved	Nickel	0.0056	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Dissolved	Nickel	0.0087	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Dissolved	Phosphorus	0.037	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-136337-1	BP-MW08-EM06	1/27/2016	SW6010B	Dissolved	Phosphorus	0.035	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-136337-1	BP-MW01-EM06	1/27/2016	SW6010B	Dissolved	Tin	0.019	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-136337-1	BP-MW03-EM06	1/27/2016	SW6010B	Dissolved	Tin	0.014	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-136337-1	BP-MW04-EM06	1/27/2016	SW6010B	Dissolved	Tin	0.014	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-136337-1	BP-MW08-EM06	1/27/2016	SW6010B	Dissolved	Tin	0.016	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-136337-1	BP-MW04-EM06	1/27/2016	SW6020	Dissolved	Antimony	1.2	ug/L	J	0.5	2	J	bl,sp	Lab Blank, Detect < PQL
440-136337-1	BP-MW03-EM06	1/27/2016	SW6020	Dissolved	Thallium	0.5	ug/L	U	0.5	1	UJ	i	Internal Standard Recovery
440-136337-1	BP-MW08-EM06	1/27/2016	SW6020	Dissolved	Thallium	0.5	ug/L	U	0.5	1	UJ	i	Internal Standard Recovery
440-136337-1	BP-MW01-EM06	1/27/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-136337-1	BP-MW01-EM06	1/27/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	UJ	m	Matrix Spike %Recovery
440-136337-2	BP-IW01-EM06	1/27/2016	SM5310B	N/A	TOC	150	mg/L		0.65	5	J-	pH	Preservation
440-138886-1	FIELDQC-EM07-FB	2/22/2016	E365.3	N/A	Phosphorus	0.044	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-138886-1	FIELDQC-EM07-EB	2/22/2016	SW6010B	Dissolved	Calcium	0.053	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-138886-1	FIELDQC-EM07-EB	2/22/2016	SW6010B	Dissolved	Magnesium	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	E300.0	N/A	Bromide	9.6	mg/L	J	0.25	10	J	sp	Detect < PQL
440-139059-1	BP-MW04-EM07	2/23/2016	E300.0	N/A	Bromide	6.7	mg/L	J	0.25	10	J	sp	Detect < PQL
440-139059-1	BP-MW07-EM07	2/23/2016	E300.1B	N/A	Chlorite	100	ug/L	UF1	10	200	R	m	Matrix Spike %Recovery
440-139059-1	BP-MW07-EM07	2/23/2016	E365.3	N/A	Phosphorus	0.43	mg/L		0.025	0.05	J+	bf	FB
440-139059-1	BP-MW02-EM07	2/23/2016	SM5220D	N/A	COD	27	mg/L	J	10	40	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SM5220D	N/A	COD	35	mg/L	J	10	40	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07	2/23/2016	SW6010B	Total	Manganese	0.013	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SW6010B	Total	Manganese	0.013	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-139059-1	BP-MW04-EM07	2/23/2016	SW6010B	Dissolved	Cobalt	0.0039	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07	2/23/2016	SW6010B	Dissolved	Iron	0.036	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SW6010B	Dissolved	Iron	0.023	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07	2/23/2016	SW6010B	Dissolved	Manganese	0.013	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SW6010B	Dissolved	Manganese	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SW6010B	Dissolved	Nickel	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-139059-1	BP-MW04-EM07	2/23/2016	SW6010B	Dissolved	Nickel	0.0075	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-139059-1	BP-MW07-EM07	2/23/2016	SW6010B	Dissolved	Nickel	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07	2/23/2016	SW6010B	Dissolved	Tin	0.013	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139059-1	BP-MW02-EM07-FD	2/23/2016	SW6010B	Dissolved	Tin	0.013	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139059-1	BP-MW04-EM07	2/23/2016	SW6010B	Dissolved	Tin	0.016	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139059-1	BP-MW07-EM07	2/23/2016	SW6010B	Dissolved	Tin	0.012	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139059-1	BP-MW09-EM07	2/23/2016	SW6010B	Dissolved	Tin	0.017	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW03-EM07	2/24/2016	E365.3	N/A	Phosphorus	0.12	mg/L		0.025	0.05	J+	bf	FB
440-139184-1	BP-MW08-EM07	2/24/2016	E365.3	N/A	Phosphorus	0.058	mg/L		0.025	0.05	J+	bf	FB
440-139184-1	BP-MW01-EM07	2/24/2016	SM5220D	N/A	COD	35	mg/L	J	10	40	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-139184-1	BP-MW03-EM07	2/24/2016	SM5220D	N/A	COD	22	mg/L	J	10	40	J	sp	Detect < PQL
440-139184-1	BP-MW05-EM07	2/24/2016	SM5220D	N/A	COD	27	mg/L	J	10	40	J	sp	Detect < PQL
440-139184-1	BP-MW06-EM07	2/24/2016	SM5220D	N/A	COD	35	mg/L	J	10	40	J	sp	Detect < PQL
440-139184-1	BP-MW01-EM07	2/24/2016	SW6010B	Total	Iron	0.18	mg/L		0.01	0.04	J+	bl	Lab Blank
440-139184-1	BP-MW06-EM07	2/24/2016	SW6010B	Dissolved	Aluminum	0.32	mg/L	J	0.025	0.5	J	sp	Detect < PQL
440-139184-1	BP-MW08-EM07	2/24/2016	SW6010B	Dissolved	Chromium	0.004	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-139184-1	BP-MW06-EM07	2/24/2016	SW6010B	Dissolved	Cobalt	0.0076	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-139184-1	BP-MW06-EM07	2/24/2016	SW6010B	Dissolved	Nickel	0.0071	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-139184-1	BP-MW01-EM07	2/24/2016	SW6010B	Dissolved	Phosphorus	0.029	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-139184-1	BP-MW05-EM07	2/24/2016	SW6010B	Dissolved	Phosphorus	0.03	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-139184-1	BP-MW06-EM07	2/24/2016	SW6010B	Dissolved	Phosphorus	0.035	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-139184-1	BP-MW01-EM07	2/24/2016	SW6010B	Dissolved	Tin	0.018	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW03-EM07	2/24/2016	SW6010B	Dissolved	Tin	0.015	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW05-EM07	2/24/2016	SW6010B	Dissolved	Tin	0.018	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW06-EM07	2/24/2016	SW6010B	Dissolved	Tin	0.016	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW08-EM07	2/24/2016	SW6010B	Dissolved	Tin	0.016	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-139184-1	BP-MW01-EM07	2/24/2016	SW6010B	Dissolved	Tungsten	5	mg/L	U	0.5	10	R	m	Matrix Spike %Recovery
440-139184-1	BP-MW03-EM07	2/24/2016	SW6010B	Dissolved	Vanadium	0.0058	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-139184-1	BP-MW03-EM07	2/24/2016	VFA-IC	N/A	Acetic acid	0.15	mg/L	UF1	0.15	1	UJ	m	Matrix Spike %Recovery
440-139184-1	BP-MW03-EM07	2/24/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-139184-1	BP-MW03-EM07	2/24/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	UJ	m	Matrix Spike %Recovery
440-139184-1	BP-MW03-EM07	2/24/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-142130-1	BP-MW08-EM08	3/21/2016	E300.0	N/A	Bromide	6.4	mg/L	J	0.25	10	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	E300.0	N/A	Chloride	0.34	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-FB	3/21/2016	E300.0	N/A	Chloride	0.32	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	E300.0	N/A	Nitrate	1.8	mg/L	J	0.055	2.2	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-FB	3/21/2016	E300.0	N/A	Nitrate	0.088	mg/L	J	0.055	0.11	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	E314.0	N/A	Perchlorate	1.5	ug/L	J	0.95	4	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	RSK175	N/A	Methane	0.00039	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6010B	Dissolved	Aluminum	0.035	mg/L	J	0.025	0.05	J	be,bf,sp	EB, FB, Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	SW6010B	Dissolved	Aluminum	0.032	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-FB	3/21/2016	SW6010B	Dissolved	Aluminum	0.038	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	SW6010B	Dissolved	Boron	0.018	mg/L	JB	0.01	0.05	J	bl,sp	Lab Blank, Detect < PQL
440-142130-1	FIELDQC-EM08-FB	3/21/2016	SW6010B	Dissolved	Boron	0.02	mg/L	JB	0.01	0.05	J	bl,sp	Lab Blank, Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6010B	Dissolved	Chromium	0.0035	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6010B	Dissolved	Iron	0.05	mg/L		0.01	0.04	J+	be	EB
440-142130-1	FIELDQC-EM08-EB	3/21/2016	SW6010B	Dissolved	Iron	0.014	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6010B	Dissolved	Nickel	0.0052	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	SW6010B	Dissolved	Strontium	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6010B	Dissolved	Vanadium	0.0082	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142130-1	FIELDQC-EM08-EB	3/21/2016	SW6010B	Dissolved	Zinc	0.017	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	SW6020	Dissolved	Selenium	6.6	ug/L	J	0.5	10	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	VFA-IC	N/A	Acetic acid	6.2	mg/L		0.15	1	J+	bf	FB
440-142130-1	FIELDQC-EM08-FB	3/21/2016	VFA-IC	N/A	Acetic acid	0.97	mg/L	J	0.15	1	J	sp	Detect < PQL
440-142130-1	BP-MW08-EM08	3/21/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-142130-1	BP-MW08-EM08	3/21/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1F2	0.14	1	UJ	m	Matrix Spike %Recovery
440-142130-1	BP-MW08-EM08	3/21/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-142292-1	BP-MW01-EM08	3/22/2016	E300.0	N/A	Bromide	5.8	mg/L	J	0.25	10	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08	3/22/2016	E300.0	N/A	Bromide	5	mg/L	J	0.25	10	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-142292-1	BP-MW02-EM08-FD	3/22/2016	E300.0	N/A	Bromide	5.4	mg/L	J	0.25	10	J	sp	Detect < PQL
440-142292-1	BP-MW05-EM08	3/22/2016	E300.0	N/A	Bromide	6.1	mg/L	J	0.25	10	J	sp	Detect < PQL
440-142292-1	BP-MW01-EM08	3/22/2016	E300.0	N/A	Nitrate	15	mg/L	F1	0.055	2.2	J-	m	Matrix Spike %Recovery
440-142292-1	BP-MW01-EM08	3/22/2016	E365.3	N/A	Phosphorus	0.027	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SM5220D	N/A	COD	26	mg/L	J	10	40	J	sp	Detect < PQL
440-142292-1	MW-K5-EM08	3/22/2016	SM5310B	N/A	TOC	2	mg/L		0.65	1	J-	pH	Preservation
440-142292-1	BP-MW09-EM08	3/22/2016	SW6010B	Total	Iron	0.011	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-142292-1	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Boron	3.2	mg/L	F1	0.01	0.25	J+	m	Matrix Spike %Recovery
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW6010B	Dissolved	Chromium	0.0047	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08	3/22/2016	SW6010B	Dissolved	Cobalt	0.0042	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW6010B	Dissolved	Cobalt	0.0038	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-142292-1	BP-MW01-EM08	3/22/2016	SW6010B	Dissolved	Iron	0.035	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-142292-1	BP-MW02-EM08	3/22/2016	SW6010B	Dissolved	Iron	0.064	mg/L		0.01	0.04	J+	be	EB
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW6010B	Dissolved	Iron	0.047	mg/L		0.01	0.04	J+	be	EB
440-142292-1	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Iron	0.01	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-142292-1	BP-MW02-EM08	3/22/2016	SW6010B	Dissolved	Nickel	0.0076	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW6010B	Dissolved	Nickel	0.0079	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142292-1	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Potassium	20	mg/L	F1	0.25	0.5	J+	m	Matrix Spike %Recovery
440-142292-1	BP-MW05-EM08	3/22/2016	SW6010B	Dissolved	Silver	0.0065	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142292-1	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Tungsten	0.5	mg/L	U^	0.5	1	UJ	q	Quantitation
440-142292-1	BP-MW02-EM08	3/22/2016	SW6010B	Dissolved	Zinc	0.016	mg/L	J	0.01	0.02	J	be,sp	EB, Detect < PQL
440-142292-1	BP-MW05-EM08	3/22/2016	SW6010B	Dissolved	Zinc	0.013	mg/L	J	0.01	0.02	J	be,sp	EB, Detect < PQL
440-142292-1	BP-MW02-EM08	3/22/2016	SW6020	Dissolved	Selenium	4.4	ug/L	J	0.5	10	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW6020	Dissolved	Selenium	4	ug/L	J	0.5	10	J	sp	Detect < PQL
440-142292-1	BP-MW05-EM08	3/22/2016	SW6020	Dissolved	Selenium	4.6	ug/L	J	0.5	10	J	sp	Detect < PQL
440-142292-1	BP-MW09-EM08	3/22/2016	SW6020	Dissolved	Selenium	12	ug/L	J	0.5	20	J	sp	Detect < PQL
440-142292-1	BP-MW02-EM08-FD	3/22/2016	SW7199	N/A	Chromium VI	1.7	ug/L	J	0.25	2	J	sp	Detect < PQL
440-142440-1	BP-MW03-EM08	3/23/2016	E300.0	N/A	Bromide	3.5	mg/L	J	0.25	5	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	E300.0	N/A	Bromide	5.2	mg/L	J	0.25	10	J	sp	Detect < PQL
440-142440-1	BP-MW06-EM08	3/23/2016	E300.0	N/A	Nitrate	1.9	mg/L	J	0.055	2.2	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	E300.0	N/A	Nitrate	1.5	mg/L	J	0.055	2.2	J	sp	Detect < PQL
440-142440-1	PC-98-EM08	3/23/2016	E300.0	N/A	Nitrate	8.7	mg/L	F1	0.055	2.2	J-	m	Matrix Spike %Recovery
440-142440-1	BP-MW07-EM08	3/23/2016	E300.1B	N/A	Chlorite	100	ug/L	UF1	10	200	R	m	Matrix Spike %Recovery
440-142440-1	BP-MW04-EM08	3/23/2016	E351.2	N/A	TKN	0.13	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	E365.3	N/A	Phosphorus	0.036	mg/L	JF1	0.025	0.05	J	m,sp	Matrix Spike %Recovery, Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	RSK175	N/A	Methane	3.9	mg/L		0.5	1	J-	pH	Preservation
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Total	Iron	0.046	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-142440-1	BP-MW06-EM08	3/23/2016	SW6010B	Total	Iron	0.23	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Cobalt	0.0069	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-142440-1	BP-MW06-EM08	3/23/2016	SW6010B	Dissolved	Cobalt	0.0065	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Copper	0.0061	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142440-1	BP-MW06-EM08	3/23/2016	SW6010B	Dissolved	Copper	0.0069	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Iron	0.019	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	SW6010B	Dissolved	Iron	0.11	mg/L		0.01	0.04	J+	be	EB
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Nickel	0.0059	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-142440-1	BP-MW03-EM08	3/23/2016	SW6010B	Dissolved	Tin	0.032	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Tin	0.021	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-142440-1	BP-MW06-EM08	3/23/2016	SW6010B	Dissolved	Tin	0.027	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	SW6010B	Dissolved	Tin	0.028	mg/L	J	0.012	0.1	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-142440-1	BP-MW03-EM08	3/23/2016	SW6010B	Dissolved	Tungsten	0.5	mg/L	U	0.5	1	UJ	q	Quantitation
440-142440-1	BP-MW04-EM08	3/23/2016	SW6010B	Dissolved	Tungsten	0.5	mg/L	U	0.5	1	UJ	q	Quantitation
440-142440-1	BP-MW06-EM08	3/23/2016	SW6010B	Dissolved	Tungsten	0.5	mg/L	U	0.5	1	UJ	q	Quantitation
440-142440-1	BP-MW07-EM08	3/23/2016	SW6010B	Dissolved	Tungsten	0.5	mg/L	U	0.5	1	UJ	q	Quantitation
440-142440-1	BP-MW03-EM08	3/23/2016	SW6020	Dissolved	Antimony	0.53	ug/L	J	0.5	2	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Antimony	0.86	ug/L	JF1	0.5	2	J	m,sp	Matrix Spike %Recovery, Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Arsenic	110	ug/L	F1	0.5	1	J-	m	Matrix Spike %Recovery
440-142440-1	BP-MW03-EM08	3/23/2016	SW6020	Dissolved	Selenium	1.5	ug/L	J	0.5	2	J	sp	Detect < PQL
440-142440-1	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Selenium	23	ug/L	F1	0.5	2	J-	m	Matrix Spike %Recovery
440-142440-1	BP-MW07-EM08	3/23/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-142440-1	BP-MW04-EM08	3/23/2016	VFA-IC	N/A	Lactic acid	2.8	mg/L	UF1	0.14	20	UJ	m	Matrix Spike %Recovery
440-142440-1	BP-MW07-EM08	3/23/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	UJ	m	Matrix Spike %Recovery
440-142440-1	BP-MW07-EM08	3/23/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-142440-2	BP-MW03-EM08	3/23/2016	E314.0	N/A	Perchlorate	6.3	ug/L		0.95	4	J+	be	EB
440-142440-2	BP-MW07-EM08	3/23/2016	SM5310B	N/A	TOC	57	mg/L		0.65	10	J-	pH	Preservation
440-144883-1	BP-MW04-EM09	4/19/2016	E300.0	N/A	Bromide	2.7	mg/L	J	0.25	5	J	sp	Detect < PQL
440-144883-1	BP-MW06-EM09	4/19/2016	E351.2	N/A	TKN	0.17	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09	4/19/2016	SW6010B	Total	Iron	0.08	mg/L		0.01	0.04	J	be,fd	EB, FD
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Total	Iron	0.13	mg/L		0.01	0.04	J	be,fd	EB, FD
440-144883-1	BP-MW02-EM09	4/19/2016	SW6010B	Dissolved	Aluminum	0.034	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Dissolved	Aluminum	0.039	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-144883-1	PC-98R-EM09	4/19/2016	SW6010B	Dissolved	Aluminum	0.036	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-144883-1	BP-MW08-EM09	4/19/2016	SW6010B	Dissolved	Boron	2.7	mg/L	F1	0.01	0.05	J-	m	Matrix Spike %Recovery
440-144883-1	BP-MW02-EM09	4/19/2016	SW6010B	Dissolved	Chromium	0.0027	mg/L	J	0.0025	0.005	J	bf,sp	FB, Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Dissolved	Chromium	0.0039	mg/L	J	0.0025	0.005	J	bf,sp	FB, Detect < PQL
440-144883-1	BP-MW04-EM09	4/19/2016	SW6010B	Dissolved	Chromium	0.006	mg/L		0.0025	0.005	J+	bf	FB
440-144883-1	BP-MW08-EM09	4/19/2016	SW6010B	Dissolved	Chromium	0.032	mg/L		0.0025	0.005	J+	bf	FB
440-144883-1	PC-98R-EM09	4/19/2016	SW6010B	Dissolved	Chromium	0.04	mg/L		0.0025	0.005	J+	bf	FB
440-144883-1	BP-MW02-EM09	4/19/2016	SW6010B	Dissolved	Cobalt	0.0036	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Dissolved	Cobalt	0.0032	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW04-EM09	4/19/2016	SW6010B	Dissolved	Cobalt	0.0057	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW06-EM09	4/19/2016	SW6010B	Dissolved	Cobalt	0.0062	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09	4/19/2016	SW6010B	Dissolved	Iron	0.012	mg/L	J	0.01	0.04	J	bl,be,bf,sp	Lab Blank, EB, FB, Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Dissolved	Iron	0.017	mg/L	J	0.01	0.04	J	bl,be,bf,sp	Lab Blank, EB, FB, Detect < PQL
440-144883-1	BP-MW04-EM09	4/19/2016	SW6010B	Dissolved	Iron	0.043	mg/L		0.01	0.04	J+	bl,be,bf	Lab Blank, EB, FB
440-144883-1	BP-MW06-EM09	4/19/2016	SW6010B	Dissolved	Iron	0.061	mg/L		0.01	0.04	J+	bl,be,bf	Lab Blank, EB, FB
440-144883-1	PC-98R-EM09	4/19/2016	SW6010B	Dissolved	Iron	0.022	mg/L	J	0.01	0.04	J	be,bf,sp	EB, FB, Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6010B	Dissolved	Lead	0.0058	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW04-EM09	4/19/2016	SW6010B	Dissolved	Lead	0.0066	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW06-EM09	4/19/2016	SW6010B	Dissolved	Lead	0.0099	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	PC-98R-EM09	4/19/2016	SW6010B	Dissolved	Lead	0.0063	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-144883-1	BP-MW08-EM09	4/19/2016	SW6010B	Dissolved	Phosphorus	0.027	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-144883-1	PC-98R-EM09	4/19/2016	SW6010B	Dissolved	Phosphorus	0.072	mg/L		0.02	0.04	J+	bl	Lab Blank
440-144883-1	BP-MW06-EM09	4/19/2016	SW6010B	Dissolved	Zinc	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09	4/19/2016	SW6020	Dissolved	Selenium	6.1	ug/L	J	0.5	10	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW6020	Dissolved	Selenium	5	ug/L	J	0.5	10	J	sp	Detect < PQL
440-144883-1	BP-MW04-EM09	4/19/2016	SW6020	Dissolved	Selenium	6.8	ug/L	J	0.5	10	J	sp	Detect < PQL
440-144883-1	BP-MW06-EM09	4/19/2016	SW6020	Dissolved	Selenium	4	ug/L	J	0.5	10	J	sp	Detect < PQL
440-144883-1	BP-MW08-EM09	4/19/2016	SW6020	Dissolved	Selenium	9.3	ug/L	J	0.5	10	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-144883-1	PC-98R-EM09	4/19/2016	SW6020	Dissolved	Selenium	8	ug/L	J	0.5	10	J	sp	Detect < PQL
440-144883-1	BP-MW02-EM09-FD	4/19/2016	SW7199	N/A	Chromium VI	4.2	ug/L	H	0.25	2	J-	h	Holding Time
440-144883-1	BP-MW06-EM09	4/19/2016	SW7199	N/A	Chromium VI	0.63	ug/L	J	0.25	2	J	sp	Detect < PQL
440-145019-1	BP-MW05-EM09	4/20/2016	E300.0	N/A	Bromide	6.1	mg/L	J	0.25	10	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	E300.0	N/A	Bromide	5.8	mg/L	J	0.25	10	J	sp	Detect < PQL
440-145019-1	BP-MW09-EM09	4/20/2016	E300.0	N/A	Bromide	5	mg/L	J	0.25	10	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	E300.0	N/A	Chloride	0.31	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-FB	4/20/2016	E300.0	N/A	Chloride	0.27	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-145019-1	BP-MW03-EM09	4/20/2016	E300.0	N/A	Nitrate	1.7	mg/L	J	0.055	2.2	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-FB	4/20/2016	E300.0	N/A	Nitrate	0.094	mg/L	J	0.055	0.11	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	E300.0	N/A	Sulfate	0.27	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	E351.2	N/A	TKN	1.3	mg/L	F1	0.1	0.2	J-	m	Matrix Spike %Recovery
440-145019-1	BP-MW01-EM09	4/20/2016	E365.3	N/A	Phosphorus	0.043	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	E365.3	N/A	Phosphorus	0.031	mg/L	JF1	0.025	0.05	J	m,sp	Matrix Spike %Recovery, Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	RSK175	N/A	Methane	0.00048	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-145019-1	BP-MW05-EM09	4/20/2016	SM5220D	N/A	COD	37	mg/L	J	10	40	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SM5220D	N/A	COD	28	mg/L	J	10	40	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SM5310B	N/A	TOC	7.5	mg/L		0.65	1	J-	pH	Preservation
440-145019-1	BP-MW09-EM09	4/20/2016	SW6010B	Total	Iron	0.012	mg/L	J	0.01	0.04	J	be,sp	EB, Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	SW6010B	Total	Iron	0.015	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Total	Manganese	2.1	mg/L	F1	0.01	0.02	J-	m	Matrix Spike %Recovery
440-145019-1	BH-01-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.037	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW03-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.045	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW05-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.049	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.039	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW09-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.039	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	MW-K5-EM09	4/20/2016	SW6010B	Dissolved	Aluminum	0.036	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-FB	4/20/2016	SW6010B	Dissolved	Boron	0.015	mg/L	J	0.01	0.05	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	SW6010B	Dissolved	Calcium	0.083	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-145019-1	BP-MW01-EM09	4/20/2016	SW6010B	Dissolved	Chromium	0.099	mg/L		0.0025	0.005	J+	bf	FB
440-145019-1	BP-MW05-EM09	4/20/2016	SW6010B	Dissolved	Chromium	0.031	mg/L		0.0025	0.005	J+	bf	FB
440-145019-1	BP-MW09-EM09	4/20/2016	SW6010B	Dissolved	Chromium	0.095	mg/L		0.0025	0.005	J+	bf	FB
440-145019-1	MW-K5-EM09	4/20/2016	SW6010B	Dissolved	Chromium	0.003	mg/L	J	0.0025	0.005	J	bf,sp	FB, Detect < PQL
440-145019-1	BP-MW05-EM09	4/20/2016	SW6010B	Dissolved	Cobalt	0.0045	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-145019-1	BP-MW01-EM09	4/20/2016	SW6010B	Dissolved	Iron	0.082	mg/L		0.01	0.04	J+	be,bf	EB, FB
440-145019-1	BP-MW03-EM09	4/20/2016	SW6010B	Dissolved	Iron	0.38	mg/L		0.01	0.04	J+	bf	FB
440-145019-1	BP-MW05-EM09	4/20/2016	SW6010B	Dissolved	Iron	0.048	mg/L		0.01	0.04	J+	be,bf	EB, FB
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Dissolved	Iron	0.66	mg/L		0.01	0.04	J+	bf	FB
440-145019-1	BP-MW09-EM09	4/20/2016	SW6010B	Dissolved	Iron	0.011	mg/L	J	0.01	0.04	J	be,bf,sp	EB, FB, Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	SW6010B	Dissolved	Iron	0.011	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-145019-1	BH-01-EM09	4/20/2016	SW6010B	Dissolved	Lead	0.0078	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-145019-1	FIELDQC-EM09-EB	4/20/2016	SW6010B	Dissolved	Magnesium	0.013	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Dissolved	Molybdenum	0.01	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-145019-1	BP-MW03-EM09	4/20/2016	SW6010B	Dissolved	Nickel	0.0053	mg/L	J	0.005	0.01	J	bf,sp	FB, Detect < PQL
440-145019-1	FIELDQC-EM09-FB	4/20/2016	SW6010B	Dissolved	Nickel	0.0075	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-145019-1	BH-01-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.054	mg/L		0.02	0.04	J+	bl	Lab Blank
440-145019-1	BP-MW01-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.042	mg/L		0.02	0.04	J+	bl	Lab Blank
440-145019-1	BP-MW03-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.075	mg/L		0.02	0.04	J+	bl	Lab Blank
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.17	mg/L	J	0.02	0.2	J	bl,sp	Lab Blank, Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-145019-1	BP-MW09-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.037	mg/L	J	0.02	0.04	J	bl,sp	Lab Blank, Detect < PQL
440-145019-1	MW-K5-EM09	4/20/2016	SW6010B	Dissolved	Phosphorus	0.068	mg/L		0.02	0.04	J+	bl	Lab Blank
440-145019-1	FIELDQC-EM09-EB	4/20/2016	SW6010B	Dissolved	Silicon	0.04	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-145019-1	BP-MW01-EM09	4/20/2016	SW6010B	Dissolved	Titanium	0.0032	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SW6010B	Dissolved	Vanadium	0.0078	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-145019-1	BH-01-EM09	4/20/2016	SW6010B	Dissolved	Zinc	0.01	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-145019-1	BP-MW01-EM09	4/20/2016	SW6010B	Dissolved	Zinc	0.012	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-145019-1	BP-MW05-EM09	4/20/2016	SW6020	Dissolved	Arsenic	160	ug/L		0.5	5	J	sd	Serial Dilution
440-145019-1	BP-MW03-EM09	4/20/2016	SW6020	Dissolved	Selenium	6.7	ug/L	J	0.5	10	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	SW6020	Dissolved	Selenium	3	ug/L	JF1	0.5	10	J	m,sp	Matrix Spike %Recovery, Detect < PQL
440-145019-1	BP-MW09-EM09	4/20/2016	SW6020	Dissolved	Selenium	9.9	ug/L	J	0.5	10	J	sp	Detect < PQL
440-145019-1	MW-K5-EM09	4/20/2016	SW6020	Dissolved	Selenium	7.2	ug/L	J	0.5	10	J	sp	Detect < PQL
440-145019-1	BP-MW07-EM09	4/20/2016	VFA-IC	N/A	Acetic acid	0.15	mg/L	UF1	0.15	1	UJ	m	Matrix Spike %Recovery
440-145019-1	BP-MW07-EM09	4/20/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-147424-1	BP-IW01-EM09B	5/12/2016	SM5310B	N/A	TOC	840	mg/L		0.65	50	J-	pH	Preservation
440-147424-1	BP-IW02-EM09B	5/12/2016	SM5310B	N/A	TOC	40	mg/L		0.65	10	J-	pH	Preservation
440-147424-1	BP-IW03-EM09B	5/12/2016	SM5310B	N/A	TOC	44	mg/L		0.65	10	J-	pH	Preservation
440-147621-1	FIELD QC EM10-EB	5/16/2016	RSK175	N/A	Methane	0.00097	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-147621-1	BP-MW04-EM10	5/16/2016	SW6010B	Dissolved	Cobalt	0.0058	mg/L	J	0.0025	0.02	J	sp	Detect < PQL
440-147621-1	FIELD QC EM10-EB	5/16/2016	SW6010B	Dissolved	Sodium	0.47	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	E365.3	N/A	Phosphorus	0.042	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-147753-1	BP-MW02-EM10	5/17/2016	SW6010B	Total	Iron	0.24	mg/L	B	0.01	0.04	J	bl,fd	Lab Blank, FD
440-147753-1	BP-MW02-EM10-FD	5/17/2016	SW6010B	Total	Iron	0.5	mg/L	B	0.01	0.04	J	fd	FD
440-147753-1	BP-MW08-EM10	5/17/2016	SW6010B	Total	Iron	0.21	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-147753-1	BP-MW02-EM10	5/17/2016	SW6010B	Dissolved	Chromium	0.0029	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	SW6010B	Dissolved	Cobalt	0.0076	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-147753-1	MW-K5-EM10	5/17/2016	SW6010B	Dissolved	Copper	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-147753-1	BP-MW02-EM10	5/17/2016	SW6010B	Dissolved	Iron	0.011	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	SW6010B	Dissolved	Iron	0.034	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	SW6010B	Dissolved	Lead	0.0031	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-147753-1	BH-01-EM10	5/17/2016	SW6010B	Dissolved	Phosphorus	0.025	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW02-EM10-FD	5/17/2016	SW6010B	Dissolved	Phosphorus	0.038	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	SW6010B	Dissolved	Phosphorus	0.029	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW08-EM10	5/17/2016	SW6010B	Dissolved	Phosphorus	0.024	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-147753-1	MW-K5-EM10	5/17/2016	SW6010B	Dissolved	Phosphorus	0.035	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-147753-1	BP-MW06-EM10	5/17/2016	SW7199	N/A	Chromium VI	0.29	ug/L	J	0.25	2	J	sp	Detect < PQL
440-147753-2	PC-98R-EM10	5/17/2016	SW6010B	Dissolved	Iron	0.021	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-147753-2	PC-98R-EM10	5/17/2016	SW6010B	Dissolved	Manganese	0.012	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-147753-2	PC-98R-EM10	5/17/2016	SW6010B	Dissolved	Tin	0.093	mg/L	J	0.012	0.1	J	sp	Detect < PQL
440-147905-1	BP-MW05-EM10	5/18/2016	E300.0	N/A	Bromide	4.7	mg/L	J	0.25	5	J	sp	Detect < PQL
440-147905-1	BP-MW09-EM10	5/18/2016	E300.0	N/A	Bromide	3.5	mg/L	J	0.25	5	J	sp	Detect < PQL
440-147905-1	BP-MW07-EM10	5/18/2016	E300.0	N/A	Nitrate	0.68	mg/L	J	0.055	1.1	J	sp	Detect < PQL
440-147905-1	BP-MW05-EM10	5/18/2016	E351.2	N/A	TKN	0.18	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-147905-1	BP-MW03-EM10	5/18/2016	E365.3	N/A	Phosphorus	0.033	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-147905-1	BP-MW05-EM10	5/18/2016	E365.3	N/A	Phosphorus	0.044	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-147905-1	BP-MW01-EM10	5/18/2016	SW6010B	Total	Iron	0.18	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-147905-1	BP-MW05-EM10	5/18/2016	SW6010B	Total	Iron	0.15	mg/L	B	0.01	0.04	J+	bl	Lab Blank
440-147905-1	BP-MW09-EM10	5/18/2016	SW6010B	Total	Iron	0.018	mg/L	JB	0.01	0.04	J	bl,sp	Lab Blank, Detect < PQL
440-147905-1	BP-MW05-EM10	5/18/2016	SW6010B	Dissolved	Barium	0.047	mg/L	J	0.005	0.05	J	sp	Detect < PQL

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-147905-1	BP-MW05-EM10	5/18/2016	SW6010B	Dissolved	Cobalt	0.003	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-147905-1	BP-MW01-EM10	5/18/2016	SW6010B	Dissolved	Iron	0.011	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-147905-1	BP-MW07-EM10	5/18/2016	SW6010B	Dissolved	Phosphorus	0.11	mg/L	J	0.02	0.2	J	sp	Detect < PQL
440-147905-1	BP-MW03-EM10	5/18/2016	SW6020	Dissolved	Antimony	0.5	ug/L	J	0.5	2	J	bl,sp	Lab Blank, Detect < PQL
440-147905-1	BP-MW05-EM10	5/18/2016	SW6020	Dissolved	Antimony	0.71	ug/L	J	0.5	2	J	bl,sp	Lab Blank, Detect < PQL
440-147905-1	BP-MW07-EM10	5/18/2016	SW6020	Dissolved	Selenium	2.4	ug/L	F1F2	0.5	2	J	m,ld	Matrix Spike %Recovery and RPD
440-147905-1	BP-MW07-EM10	5/18/2016	VFA-IC	N/A	Acetic acid	0.15	mg/L	U^F1	0.15	1	UJ	m	Matrix Spike %Recovery
440-147905-1	BP-MW07-EM10	5/18/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-147905-1	BP-MW07-EM10	5/18/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-154949-1	FIELDQC-EM11-EB	8/8/2016	RSK175	N/A	Methane	0.0005	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-154949-1	FIELDQC-EM11-FB	8/8/2016	SW6010B	Total	Iron	0.031	mg/L	J	0.01	0.04	J	sp	Detect < PQL
440-154949-1	FIELDQC-EM11-FB	8/8/2016	SW6010B	Dissolved	Aluminum	0.031	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-154949-1	FIELDQC-EM11-EB	8/8/2016	SW6010B	Dissolved	Calcium	0.1	mg/L	B	0.05	0.1	J+	bl	Lab Blank
440-154949-1	FIELDQC-EM11-FB	8/8/2016	SW6010B	Dissolved	Iron	0.011	mg/L	JB	0.01	0.04	J	bl,sp	Lab Blank, Detect < PQL
440-154949-1	FIELDQC-EM11-EB	8/8/2016	SW6010B	Dissolved	Magnesium	0.012	mg/L	JB	0.01	0.02	J	bl,sp	Lab Blank, Detect < PQL
440-154949-1	FIELDQC-EM11-EB	8/8/2016	SW6010B	Dissolved	Silicon	0.026	mg/L	JB	0.025	0.05	J	bl,sp	Lab Blank, Detect < PQL
440-154949-1	FIELDQC-EM11-FB	8/8/2016	SW6010B	Dissolved	Silicon	0.033	mg/L	JB	0.025	0.05	J	bl,sp	Lab Blank, Detect < PQL
440-154949-1	FIELDQC-EM11-EB	8/8/2016	SW6010B	Dissolved	Sodium	0.7	mg/L	B	0.25	0.5	J+	bl	Lab Blank
440-155093-1	BP-MW02-EM11	8/9/2016	E300.0	N/A	Bromide	6.7	mg/L	J	0.25	10	J	sp	Detect < PQL
440-155093-1	BP-MW02-EM11-FD	8/9/2016	E300.0	N/A	Bromide	5.3	mg/L	J	0.25	10	J	sp	Detect < PQL
440-155093-1	BP-MW09-EM11	8/9/2016	E300.0	N/A	Bromide	5.8	mg/L	J	0.25	10	J	sp	Detect < PQL
440-155093-1	BP-MW02-EM11	8/9/2016	E300.0	N/A	Nitrate	6.1	mg/L	H	0.055	2.2	J-	h	Holding Time
440-155093-1	BP-MW02-EM11-FD	8/9/2016	E300.0	N/A	Nitrate	5.7	mg/L	H	0.055	2.2	J-	h	Holding Time
440-155093-1	BP-MW07-EM11	8/9/2016	E300.0	N/A	Nitrate	1.1	mg/L	UF1	0.055	2.2	UJ	m	Matrix Spike %Recovery
440-155093-1	BP-MW09-EM11	8/9/2016	E300.0	N/A	Nitrate	11	mg/L	H	0.055	2.2	J-	h	Holding Time
440-155093-1	BP-MW02-EM11	8/9/2016	E300.0	N/A	Nitrite	1.4	mg/L	UH	0.07	3	UJ	h	Holding Time
440-155093-1	BP-MW02-EM11-FD	8/9/2016	E300.0	N/A	Nitrite	1.4	mg/L	UH	0.07	3	UJ	h	Holding Time
440-155093-1	BP-MW09-EM11	8/9/2016	E300.0	N/A	Nitrite	1.4	mg/L	UH	0.07	3	UJ	h	Holding Time
440-155093-1	BP-MW07-EM11	8/9/2016	E314.0	N/A	Perchlorate	3.1	ug/L	JF1	0.95	4	J	sp,m	Detect < PQL, Matrix Spike %Recovery
440-155093-1	BP-MW07-EM11	8/9/2016	E365.3	N/A	Phosphorus	0.12	mg/L	F1F2	0.025	0.05	J	m,ld	Matrix Spike %Recovery and RPD
440-155093-1	BP-MW02-EM11	8/9/2016	RSK175	N/A	Methane	0.01	mg/L		0.00025	0.00099	J	fd	FD
440-155093-1	BP-MW02-EM11-FD	8/9/2016	RSK175	N/A	Methane	0.0042	mg/L		0.00025	0.00099	J	be,fd	EB, FD
440-155093-1	BP-MW09-EM11	8/9/2016	RSK175	N/A	Methane	0.00035	mg/L	J	0.00025	0.00099	J	be,sp	EB, Detect < PQL
440-155093-1	BP-MW04-EM11	8/9/2016	SM5220D	N/A	COD	37	mg/L	J	10	40	J	sp	Detect < PQL
440-155093-1	BP-MW07-EM11	8/9/2016	SM5220D	N/A	COD	50	mg/L	F1	10	40	J-	m	Matrix Spike %Recovery
440-155093-1	BP-MW02-EM11	8/9/2016	SW6010B	Total	Iron	0.044	mg/L		0.01	0.04	J+	bf	FB
440-155093-1	BP-MW02-EM11-FD	8/9/2016	SW6010B	Total	Iron	0.033	mg/L	J	0.01	0.04	J	bf,sp	FB, Detect < PQL
440-155093-1	BP-MW07-EM11	8/9/2016	SW6010B	Total	Iron	1.5	mg/L	F1	0.01	0.04	J+	m	Matrix Spike %Recovery
440-155093-1	BP-MW08-EM11	8/9/2016	SW6010B	Total	Iron	0.012	mg/L	J	0.01	0.04	J	bf,sp	FB, Detect < PQL
440-155093-1	BP-MW04-EM11	8/9/2016	SW6010B	Dissolved	Cobalt	0.003	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-155093-1	BP-MW07-EM11	8/9/2016	SW6010B	Dissolved	Potassium	21	mg/L	F1	0.25	0.5	J+	m	Matrix Spike %Recovery
440-155093-1	BP-MW02-EM11	8/9/2016	SW6020	Dissolved	Selenium	7.9	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155093-1	BP-MW02-EM11-FD	8/9/2016	SW6020	Dissolved	Selenium	7.3	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155093-1	BP-MW04-EM11	8/9/2016	SW6020	Dissolved	Selenium	5.8	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155093-1	BP-MW08-EM11	8/9/2016	SW6020	Dissolved	Selenium	7.4	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155093-1	BP-MW07-EM11	8/9/2016	VFA-IC	N/A	Acetic acid	0.15	mg/L	UF1	0.15	1	UJ	m	Matrix Spike %Recovery
440-155093-1	BP-MW07-EM11	8/9/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-155093-1	BP-MW07-EM11	8/9/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	UJ	m	Matrix Spike %Recovery
440-155093-1	BP-MW07-EM11	8/9/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery

Table 7 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	MDL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-155280-1	BP-MW05-EM11	8/10/2016	E300.0	N/A	Bromide	3.7	mg/L	J	0.25	5	J	sp	Detect < PQL
440-155280-1	BP-MW05-EM11	8/10/2016	E365.3	N/A	Phosphorus	0.043	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	SM5220D	N/A	COD	15	mg/L	J	4.5	20	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SM5220D	N/A	COD	14	mg/L	J	4.5	20	J	sp	Detect < PQL
440-155280-1	BP-MW05-EM11	8/10/2016	SM5220D	N/A	COD	19	mg/L	J	4.5	20	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SM5220D	N/A	COD	17	mg/L	J	4.5	20	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Total	Iron	0.3	mg/L		0.01	0.04	J+	bf	FB
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Dissolved	Cobalt	0.0046	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SW6010B	Dissolved	Cobalt	0.0054	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	SW6010B	Dissolved	Copper	0.0085	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Dissolved	Copper	0.0093	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW05-EM11	8/10/2016	SW6010B	Dissolved	Copper	0.0053	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SW6010B	Dissolved	Copper	0.0058	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	SW6010B	Dissolved	Nickel	0.0065	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Dissolved	Nickel	0.0063	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SW6010B	Dissolved	Nickel	0.0052	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Dissolved	Phosphorus	0.031	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-155280-1	BP-MW05-EM11	8/10/2016	SW6010B	Dissolved	Phosphorus	0.025	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	SW6010B	Dissolved	Zinc	0.012	mg/L	J	0.01	0.02	J	be,sp	EB, Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6010B	Dissolved	Zinc	0.013	mg/L	J	0.01	0.02	J	be,sp	EB, Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	SW6020	Dissolved	Selenium	8.8	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155280-1	BP-MW03-EM11	8/10/2016	SW6020	Dissolved	Selenium	7.6	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155280-1	BP-MW05-EM11	8/10/2016	SW6020	Dissolved	Selenium	6.7	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SW6020	Dissolved	Selenium	4.6	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155280-1	BP-MW06-EM11	8/10/2016	SW7199	N/A	Chromium VI	0.34	ug/L	J	0.25	2	J	sp	Detect < PQL
440-155280-1	BP-MW01-EM11	8/10/2016	VFA-IC	N/A	Formic-acid	0.11	mg/L	UF1	0.11	1	UJ	m	Matrix Spike %Recovery
440-155280-1	BP-MW01-EM11	8/10/2016	VFA-IC	N/A	Lactic acid	0.14	mg/L	UF1	0.14	1	UJ	m	Matrix Spike %Recovery
440-155280-1	BP-MW01-EM11	8/10/2016	VFA-IC	N/A	n-Butyric Acid	0.16	mg/L	UF1	0.16	1	UJ	m	Matrix Spike %Recovery
440-155522-1	BP-IW03-EM11	8/11/2016	E300.0	N/A	Nitrate	0.71	mg/L	J	0.055	1.1	J	sp	Detect < PQL
440-155522-1	BP-IW01-EM11	8/11/2016	SM5310B	N/A	TOC	0.87	mg/L	J	0.65	1	J	pH,sp	Preservation, Detect < PQL
440-155522-1	MW-K5-EM11	8/11/2016	SW6010B	Dissolved	Chromium	0.0025	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-155522-1	BH-01-EM11	8/11/2016	SW6010B	Dissolved	Cobalt	0.0027	mg/L	J	0.0025	0.01	J	sp	Detect < PQL
440-155522-1	MW-K5-EM11	8/11/2016	SW6010B	Dissolved	Copper	0.0071	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155522-1	PC-98R-EM11	8/11/2016	SW6010B	Dissolved	Copper	0.0061	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-155522-1	BH-01-EM11	8/11/2016	SW6010B	Dissolved	Phosphorus	0.027	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-155522-1	MW-K5-EM11	8/11/2016	SW6010B	Dissolved	Phosphorus	0.034	mg/L	J	0.02	0.04	J	sp	Detect < PQL
440-155522-1	BH-01-EM11	8/11/2016	SW6020	Dissolved	Selenium	7.3	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155522-1	MW-K5-EM11	8/11/2016	SW6020	Dissolved	Selenium	7.9	ug/L	J	0.5	10	J	sp	Detect < PQL
440-155522-1	PC-98R-EM11	8/11/2016	SW6020	Dissolved	Selenium	8.9	ug/L	J	0.5	10	J	sp	Detect < PQL

Table 8 MS/MSD RPD Exceedances

SDG	Method	Sample	Analyte	RPD (%)	Allowed RPD (%)
440-119195-1	SW6010B	BP-MW08-B-MS/MSD	Calcium	26	20
440-119195-1	SW6010B	BP-MW08-B-MS/MSD	Iron	34	20
440-131433-1	E300.0	BP-MW08-EM02-MS/MSD	Nitrate as N	76	20
440-142130-1	VFA-IC	BP-MW08-EM08-MS/MSD	Lactic Acid	21	20
440-147905-1	SW6020	BP-MW07-EM10-MS/MSD	Selenium	23	20
440-155093-1	E365.3	BP-MW07-EM11-MS/MSD	Phosphorus	23	20

Table 9 FD Exceedances

SDG	Method	Analyte	Units	Parent Sample ID	Result	FD Result	RPD (%)	Difference
440-107289-1	E314.0	Perchlorate	mg/kg	BHW-1-0-201504	4.9	7.9	46.9	---
440-136168-1	SW6010B	Dissolved Iron	mg/l	BP-MW02-EM06	0.04 U	0.2	---	0.16
440-144883-1	SW6010B	Total Iron	mg/l	BP-MW02-EM09	0.08	0.13	---	0.05
440-147753-1	SW6010B	Total Iron	mg/l	BP-MW02-EM10	0.24	0.5	70.3	---
440-155093-1	RSK175	Methane	mg/l	BP-MW02-EM11	0.01	0.0042	81.7	---

Table 10 Calibration Exceedances

SDG	Method	Sample	Analyte	Recovery (%)	Allowed (%)
440-122317-1	VFA-IC	CCV	Pyruvic Acid	123	80-120
440-122387-1	VFA-IC	CCV	Pyruvic Acid	123	80-120
440-139059-1	SW6010B	CCV	Dissolved Iron	114	90-110
440-147753-1	VFA-IC	CCV	Acetic acid	273	80-120
440-147905-1	VFA-IC	CCV	Acetic acid	273	80-120

Table 11 MS/MSD Recovery Exceedances

SDG	Lab Sample ID	Spiked Sample	Sample Date	Method	Fraction	Analyte	MS Recovery (%)	MSD Recovery (%)	Acceptance Range (%)
440-108121-1	440-108121-1	BHW-1-20150427	4/27/2015	E300.0	N/A	Bromide	76	66	80-120
440-108121-1	440-108121-1	BHW-1-20150427	4/27/2015	E300.0	N/A	Nitrate as N	76	67	80-120
440-122031-1	440-122031-1	BP-MW08-EMBL	9/21/2015	VFA-IC	Total	Pyruvic Acid	11	13	80-120
440-122031-1	440-122031-2	BP-MW02-EMBL	9/21/2015	VFA-IC	Total	Formic-acid	66	Not analyzed	80-120
440-122031-1	440-122031-2	BP-MW02-EMBL	9/21/2015	VFA-IC	Total	Lactic acid	20	Not analyzed	80-120
440-122031-1	440-122031-2	BP-MW02-EMBL	9/21/2015	VFA-IC	Total	n-Butyric Acid	75	Not analyzed	80-120
440-122031-1	440-122031-2	BP-MW02-EMBL	9/21/2015	VFA-IC	Total	Propionic acid	1126	Not analyzed	80-120
440-122031-1	440-122031-2	BP-MW02-EMBL	9/21/2015	VFA-IC	Total	Pyruvic Acid	10	Not analyzed	80-120
440-122171-1	440-122171-1	BH-1-EMBL	9/22/2015	E300.0	N/A	Bromide	123	118	80-120
440-122171-1	440-122171-1	BH-1-EMBL	9/22/2015	E300.0	N/A	Nitrate as N	73	69	80-120
440-122171-1	440-122171-5	MW-K5-EMBL	9/22/2015	E300.0	N/A	Nitrite as N	155	151	80-120
440-122317-1	440-122317-1	BP-MW06-EMBL	9/23/2015	E300.0	N/A	Nitrite as N	158	155	80-120
440-122317-1	440-122317-6	BP-IW03-EMBL	9/23/2015	VFA-IC	Total	Acetic acid	67	Not analyzed	80-120
440-122317-1	440-122317-6	BP-IW03-EMBL	9/23/2015	VFA-IC	Total	Formic-acid	54	Not analyzed	80-120
440-122317-1	440-122317-6	BP-IW03-EMBL	9/23/2015	VFA-IC	Total	Lactic acid	3	Not analyzed	80-120
440-122317-1	440-122317-6	BP-IW03-EMBL	9/23/2015	VFA-IC	Total	n-Butyric Acid	55	Not analyzed	80-120
440-122317-1	440-122317-6	BP-IW03-EMBL	9/23/2015	VFA-IC	Total	Propionic acid	61	Not analyzed	80-120
440-122317-1	440-122317-7	FIELDQC-EMBL-FB	9/23/2015	VFA-IC	Total	Pyruvic Acid	130	Not analyzed	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	E300.0	N/A	Nitrate as N	78	75	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	E351.2	Total	Total Kjeldahl Nitrogen	52	61	90-110
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	VFA-IC	Total	Acetic acid	78	75	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	VFA-IC	Total	Lactic acid	127	87	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	VFA-IC	Total	n-Butyric Acid	55	47	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	VFA-IC	Total	Propionic acid	62	63	80-120
440-122387-1	440-122387-1MS	BP-MW04-EMBL	9/24/2015	VFA-IC	Total	Pyruvic Acid	60	60	80-120
440-131337-1	440-131337-1	BP-MW07-EM02	12/16/2015	E365.3	Total	Phosphorus	19	19	75-125
440-131433-1	440-131433-3	BP-MW08-EM02	12/17/2015	E300.0	N/A	Nitrate as N	96	296	80-120
440-132568-1	440-132568-3	BP-MW07-EM04	12/29/2015	E300.0	N/A	Nitrite as N	128	122	80-120
440-132568-1	440-132568-3	BP-MW07-EM04	12/29/2015	SM5310B	Total	Total Organic Carbon	80	76	80-120
440-132568-1	440-132568-3	BP-MW07-EM04	12/29/2015	VFA-IC	Total	Lactic acid	75	77	80-120
440-132568-1	440-132568-3	BP-MW07-EM04	12/29/2015	VFA-IC	Total	Propionic acid	136	124	80-120
440-132568-1	440-132568-3	BP-MW07-EM04	12/29/2015	VFA-IC	Total	Pyruvic Acid	176	157	80-120
440-132568-1	440-132568-4	BP-MW03-EM04	12/29/2015	VFA-IC	Total	Pyruvic Acid	175	160	80-120
440-134828-2	440-134828-1	BP-MW07-EM05	1/12/2016	E300.1B	N/A	Chlorite	0	0	75-125
440-134828-2	440-134828-1	BP-MW07-EM05	1/12/2016	E314.0	N/A	Perchlorate	58	69	80-120
440-136168-1	440-136168-1	BP-MW09-EM06	1/26/2016	E365.3	Total	Phosphorus	0	0	75-125
440-136168-1	440-136168-2	BP-MW07-EM06	1/26/2016	E300.0	N/A	Nitrite as N	138	138	80-120
440-136168-1	440-136168-2	BP-MW07-EM06	1/26/2016	E300.0	N/A	Sulfate	70	67	80-120

Table 11 MS/MSD Recovery Exceedances

SDG	Lab Sample ID	Spiked Sample	Sample Date	Method	Fraction	Analyte	MS Recovery (%)	MSD Recovery (%)	Acceptance Range (%)
440-136168-1	440-136168-2	BP-MW07-EM06	1/26/2016	SW6010B	Dissolved	Tungsten	101	0	75-125
440-136168-1	440-136168-2	BP-MW07-EM06	1/26/2016	VFA-IC	Total	Pyruvic Acid	160	148	80-120
440-136337-1	440-136337-2	BP-MW01-EM06	1/27/2016	E365.3	Total	Phosphorus	56	45	75-125
440-136337-1	440-136337-2	BP-MW01-EM06	1/27/2016	VFA-IC	Total	Formic-acid	75	81	80-120
440-136337-1	440-136337-2	BP-MW01-EM06	1/27/2016	VFA-IC	Total	Lactic acid	46	50	80-120
440-136337-1	440-136337-2	BP-MW01-EM06	1/27/2016	VFA-IC	Total	Pyruvic Acid	129	127	80-120
440-136337-1	440-136337-4	BP-MW08-EM06	1/27/2016	E300.0	N/A	Nitrite as N	159	157	80-120
440-139059-1	440-139059-3	BP-MW07-EM07	2/23/2016	E300.0	N/A	Nitrite as N	124	123	80-120
440-139059-1	440-139059-3	BP-MW07-EM07	2/23/2016	E300.1B	N/A	Chlorite	0	0	75-125
440-139059-1	440-139059-3	BP-MW07-EM07	2/23/2016	VFA-IC	Total	Propionic acid	158	148	80-120
440-139184-1	440-139184-3	BP-MW01-EM07	2/24/2016	SW6010B	Dissolved	Tungsten	0	0	75-125
440-139184-1	440-139184-5	BP-MW03-EM07	2/24/2016	VFA-IC	Total	Acetic acid	78	Not analyzed	80-120
440-139184-1	440-139184-5	BP-MW03-EM07	2/24/2016	VFA-IC	Total	Formic-acid	68	Not analyzed	80-120
440-139184-1	440-139184-5	BP-MW03-EM07	2/24/2016	VFA-IC	Total	Lactic acid	60	Not analyzed	80-120
440-139184-1	440-139184-5	BP-MW03-EM07	2/24/2016	VFA-IC	Total	n-Butyric Acid	55	Not analyzed	80-120
440-139184-1	440-139184-5	BP-MW03-EM07	2/24/2016	VFA-IC	Total	Propionic acid	2466	Not analyzed	80-120
440-139184-1	440-139184-7	BP-MW08-EM07	2/24/2016	VFA-IC	Total	Pyruvic Acid	122	Not analyzed	80-120
440-142130-1	440-142130-3	BP-MW08-EM08	3/21/2016	VFA-IC	Total	Formic-acid	71	77	80-120
440-142130-1	440-142130-3	BP-MW08-EM08	3/21/2016	VFA-IC	Total	Lactic acid	70	86	80-120
440-142130-1	440-142130-3	BP-MW08-EM08	3/21/2016	VFA-IC	Total	n-Butyric Acid	45	45	80-120
440-142130-1	440-142130-3	BP-MW08-EM08	3/21/2016	VFA-IC	Total	Propionic acid	1369	1384	80-120
440-142292-1	440-142292-3	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Boron	149	139	75-125
440-142292-1	440-142292-3	BP-MW09-EM08	3/22/2016	SW6010B	Dissolved	Potassium	110	133	75-125
440-142292-1	440-142292-4	BP-MW01-EM08	3/22/2016	E300.0	N/A	Nitrate as N	72	73	80-120
440-142440-1	440-142440-1	PC-98-EM08	3/23/2016	E300.0	N/A	Nitrate as N	77	82	80-120
440-142440-1	440-142440-1	PC-98-EM08	3/23/2016	E300.0	N/A	Nitrite as N	118	143	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	E300.0	N/A	Nitrite as N	144	143	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	E300.1B	N/A	Chlorite	0	0	75-125
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	E365.3	Total	Phosphorus	17	19	75-125
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Antimony	63	67	75-125
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Arsenic	64	76	75-125
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	SW6020	Dissolved	Selenium	-10	-12	75-125
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	VFA-IC	Total	Formic-acid	71	79	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	VFA-IC	Total	Lactic acid	52	56	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	VFA-IC	Total	n-Butyric Acid	47	47	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	VFA-IC	Total	Propionic acid	4300	4360	80-120
440-142440-1	440-142440-2	BP-MW07-EM08	3/23/2016	VFA-IC	Total	Pyruvic Acid	134	137	80-120
440-142440-1	440-142440-5	BP-MW04-EM08	3/23/2016	VFA-IC	Total	Lactic acid	78	Not analyzed	80-120

Table 11 MS/MSD Recovery Exceedances

SDG	Lab Sample ID	Spiked Sample	Sample Date	Method	Fraction	Analyte	MS Recovery (%)	MSD Recovery (%)	Acceptance Range (%)
440-144883-1	440-144883-1	BP-MW08-EM09	4/19/2016	SW6010B	Dissolved	Boron	71	77	75-125
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	E300.0	N/A	Nitrite as N	124	124	80-120
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	E351.2	Total	Total Kjeldahl Nitrogen	95	89	90-110
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	E365.3	Total	Phosphorus	16	18	75-125
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	SW6010B	Total	Manganese	76	73	75-125
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	SW6020	Dissolved	Selenium	37	44	75-125
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	VFA-IC	Total	Acetic acid	56	57	80-120
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	VFA-IC	Total	Lactic acid	135	134	80-120
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	VFA-IC	Total	n-Butyric Acid	36	32	80-120
440-145019-1	440-145019-6	BP-MW07-EM09	4/20/2016	VFA-IC	Total	Propionic acid	3430	3292	80-120
440-147905-1	440-147905-2	BP-MW07-EM10	5/18/2016	E300.0	N/A	Nitrite as N	122	122	80-120
440-147905-1	440-147905-2	BP-MW07-EM10	5/18/2016	VFA-IC	Total	Acetic acid	73	69	80-120
440-147905-1	440-147905-2	BP-MW07-EM10	5/18/2016	VFA-IC	Total	Formic-acid	77	82	80-120
440-147905-1	440-147905-2	BP-MW07-EM10	5/18/2016	VFA-IC	Total	n-Butyric Acid	68	66	80-120
440-147905-1	440-147905-2	BP-MW07-EM10	5/18/2016	VFA-IC	Total	Propionic acid	2770	2755	80-120
440-147905-1	440-147905-2MSD	BP-MW07-EM10	5/18/2016	SW6020	Dissolved	Selenium	77	61	75-125
440-147905-1	440-147905-2MSD	BP-MW07-EM10	5/18/2016	VFA-IC	Total	Pyruvic Acid	117	122	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	SM5220D	Total	Chemical Oxygen Demand	67	69	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	E300.0	Total	Nitrate as N	79	78	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	E300.0	Total	Nitrite as N	181	181	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	E314.0	N/A	Perchlorate	120	126	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	E365.3	Total	Phosphorus	104	67	75-125
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	SW6010B	Dissolved	Potassium	110	134	75-125
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	SW6010B	Total	Iron	127	126	75-125
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	Acetic acid	69	69	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	Formic-acid	68	64	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	Lactic acid	40	36	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	n-Butyric Acid	47	42	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	Propionic acid	2382	2386	80-120
440-155093-1	440-155093-2MS	BP-MW07-EM11	8/9/2016	VFA-IC	Total	Pyruvic Acid	141	134	80-120
440-155280-1	440-155280-4	BP-MW01-EM11	8/10/2016	VFA-IC	Total	Formic-acid	70	64	80-120
440-155280-1	440-155280-4	BP-MW01-EM11	8/10/2016	VFA-IC	Total	Lactic acid	46	38	80-120
440-155280-1	440-155280-4	BP-MW01-EM11	8/10/2016	VFA-IC	Total	n-Butyric Acid	70	69	80-120
440-155280-1	440-155280-4	BP-MW01-EM11	8/10/2016	VFA-IC	Total	Pyruvic Acid	121	127	80-120

Table 12 Holding Time Exceedances

SDG	Sample ID	Method	Analyte	Time Limit	Time Elapsed
440-108121-1	BHW-1-20150427	SW7199	Chromium VI	24 hours	26.1 hours
440-108121-1	PC-98R-20150427	SW7199	Chromium VI	24 hours	24.5 hours
440-130250-1	BP-MW01-EM01	E300.0	Nitrate as N	48 hours	52 hours
440-130250-1	BP-MW03-EM01	E300.0	Nitrate as N	48 hours	49.4 hours
440-130250-1	BP-MW05-EM01	E300.0	Nitrate as N	48 hours	50.9 hours
440-130250-1	BP-MW05-EM01-FD	E300.0	Nitrate as N	48 hours	51.1 hours
440-136337-1	BP-MW03-EM06	E300.1	Chlorite	14 days	17.3 days
440-136337-1	BP-MW04-EM06	E300.1	Chlorite	14 days	17.2 days
440-136337-1	BP-MW08-EM06	E300.1	Chlorite	14 days	17.2 days
440-144883-1	BP-MW02-EM09-FD	SW7199	Chromium VI	24 hours	24.2 hours
440-155093-1	BP-MW02-EM11	E300.0	Nitrate as N	48 hours	85.5 hours
440-155093-1	BP-MW02-EM11	E300.0	Nitrite as N	48 hours	85.5hours
440-155093-1	BP-MW02-EM11-FD	E300.0	Nitrate as N	48 hours	75.2 hours
440-155093-1	BP-MW02-EM11-FD	E300.0	Nitrite as N	48 hours	75.2 hours
440-155093-1	BP-MW09-EM11	E300.0	Nitrate as N	48 hours	85.1hours
440-155093-1	BP-MW09-EM11	E300.0	Nitrite as N	48 hours	85.1 hours

Table 13 Sample Preservation Infractions

SDG	Sample ID	Method	Analyte	Sample pH	Limit
440-122171-1	MW-K5-EMBL	E300.1	Chlorate	pH > 2	pH < 2
440-122171-1	MW-K5-EMBL	E300.1	Chlorite	pH > 2	pH < 2
440-132568-1	FIELD QC-EM04-EB	E365.3	Phosphorus	pH > 2	pH < 2
440-132568-1	FIELD QC-EM04-EB	NTOTAL-CALC	Nitrogen, Total	pH > 2	pH < 2
440-132568-1	FIELD QC-EM04-EB	E365.3	Phosphorus	pH > 2	pH < 2
440-132568-1	FIELD QC-EM04-EB	NTOTAL-CALC	Nitrogen, Total	pH > 2	pH < 2
440-134828-1	BP-MW07-EM05	SM5310B	TOC	pH > 2	pH < 2
440-134828-1	BP-MW07-EM05-FD	SM5310B	TOC	pH > 2	pH < 2
440-136168-1	BP-MW07-EM06	SM5310B	TOC	pH > 2	pH < 2
440-136337-1	BP-IW01-EM06	SM5310B	TOC	pH > 2	pH < 2
440-136337-1	BP-MW03-EM06	SM5220D	COD	pH > 2	pH < 2
440-142292-1	MW-K5-EM08	SM5310B	TOC	pH > 2	pH < 2
440-142440-1	BP-MW07-EM08	RSK175	Methane	pH > 2	pH < 2
440-142440-1	BP-MW07-EM08	SM5310B	TOC	pH > 2	pH < 2
440-145019-1	BP-MW07-EM09	SM5310B	TOC	pH > 2	pH < 2
440-147424-1	BP-IW01-EM09B	SM5310B	TOC	pH > 2	pH < 2
440-147424-1	BP-IW02-EM09B	SM5310B	TOC	pH > 2	pH < 2
440-147424-1	BP-IW03-EM09B	SM5310B	TOC	pH > 2	pH < 2
440-155522-1	BP-IW01-EM11	SM5310B	TOC	pH > 2	pH < 2

Table 14 Calibration Blank Detections

SDG	Blank Type	Method	Analyte	Maximum Concentration	Units	Associated Samples
440-122387-1	ICB/CCB	SW6010B	Molybdenum	0.0132	mg/L	BP-MW04-EMBL, BP-MW03-EMBL
440-122387-1	CCB	SW6010B	Silicon	0.0274	mg/L	BP-MW04-EMBL, BP-MW03-EMBL
440-122387-1	ICB/CCB	SW6020	Antimony	0.520	ug/L	BP-MW04-EMBL, BP-MW03-EMBL
440-122031-1	CCB	E300.0	Chloride	0.274	ug/mL	BP-MW08-EMBL, BP-MW02-EMBL
440-122317-1	CCB	SW6010B	Aluminum	0.0642	mg/L	BP-MW06-EMBL,BP-IW01-EMBL,BP-MW07-EMBL,BP-IW02-EMBL,BP-MW09-EMBL,BP-IW03-EMBL
440-134828-1	CCB	SW6010B	Iron	0.0218	mg/L	BP-MW07-EM05,BP-MW07-EM05-MS,BP-MW07-EM05-MSD
440-134828-1	CCB	SW6010B	Iron	0.0132	mg/L	BP-MW06-EM05,BP-MW06-EM05-FD
440-136058-1	ICB/CCB	SW6010B	Lead	0.00430	mg/L	FIELDQC-EM06-EB, FIELDQC-EM06-FB
440-136337-1	CCB	SW6010B	Boron	0.0134	mg/L	BP-MW01-EM06,BP-MW03-EM06,BP-MW04-EM06,BP-MW08-EM06
440-136337-1	ICB	SW6010B	Lead	0.00322	mg/L	BP-MW01-EM06,BP-MW03-EM06,BP-MW04-EM06,BP-MW08-EM06
440-136337-1	CCB	SW6020	Antimony	0.537	ug/mL	BP-MW01-EM06,BP-MW03-EM06,BP-MW04-EM06,BP-MW08-EM06
440-136337-1	CCB	E300.0	Chloride	0.287	ug/mL	BP-IW01-EM06,BP-IW03-EM06,BP-MW01-EM06,BP-MW03-EM06,BP-MW04-EM06,BP-MW08-EM06
440-136507-1	CCB	E300.0	Sulfate	0.256	ug/mL	BH-01-EM06,BP-IW02-EM06,MW-K5-EM06,PC-98R-EM06
440-139059-1	CCB	SW6010B	Magnesium	0.0143	mg/L	BP-MW02-EM07,BP-MW02-EM07-FD,BP-MW04-EM07,BP-MW09-EM07, BP-MW07-EM07
440-139059-1	CCB	SW6010B	Copper	0.0634	mg/L	BP-MW04-EM07
440-139059-1	CCB	SW6020	Antimony	0.514	ug/mL	BP-MW02-EM07,BP-MW02-EM07-FD,BP-MW04-EM07
440-139184-1	ICB/CCB	SW6010B	Iron	0.0209	mg/L	BP-MW01-EM07,BP-MW03-EM07,BP-MW06-EM07,BP-MW08-EM07
440-139184-1	CCB	E300.0	Chloride	0.304	ug/mL	BP-MW01-EM07,BP-MW03-EM07,BP-MW05-EM07,BP-MW06-EM07,BP-MW08-EM07
440-142130-1	CCB	SW6010B	Beryllium	0.00112	mg/L	FieldQC-EM08-EB, FieldQC-EM08-FB, BP-MW08-EM08
440-142130-1	CCB	SW6010B	Boron	0.01050	mg/L	FieldQC-EM08-EB, FieldQC-EM08-FB, BP-MW08-EM08
440-142130-1	CCB	SW6010B	Titanium	0.00274	mg/L	FieldQC-EM08-EB, FieldQC-EM08-FB, BP-MW08-EM08
440-144883-1	CCB	SW6010B	Iron	0.0208	mg/L	BP-MW02-EM09,BP-MW02-EM09-FD,BP-MW04-EM09, BP-MW06-EM09,PC-98R-EM09
440-144883-1	CCB	SW6010B	Phosphorus	0.0282	mg/L	BP-MW02-EM09,BP-MW02-EM09-FD,BP-MW04-EM09, BP-MW06-EM09,PC-98R-EM09
440-144883-1	CCB	SW6010B	Calcium	0.120	mg/L	BP-MW02-EM09,BP-MW02-EM09-FD,BP-MW04-EM09, BP-MW06-EM09,PC-98R-EM09
440-144883-1	CCB	SW6010B	Titanium	0.00257	mg/L	BP-MW02-EM09,BP-MW02-EM09-FD,BP-MW04-EM09, BP-MW06-EM09,PC-98R-EM09
440-144883-1	CCB	SW6010B	Magnesium	0.0121	mg/L	BP-MW08-EM09
440-144883-1	ICB	SW6010B	Silver	0.00989	mg/L	BP-MW08-EM09
440-145019-1	CCB	SW6010B	Calcium	0.120	mg/L	EM09
440-145019-1	CCB	SW6010B	Phosphorus	0.0330	mg/L	EM09
440-145019-1	CCB	SW6010B	Magnesium	0.0324	mg/L	BH-01-EM09, BP-MW03-EM09, BP-MW05-EM09,BP-MW07-EM09,BP-MW09-EM09,MW-K5-EM09
440-145019-1	CCB	SW6010B	Sodium	0.3190	mg/L	BH-01-EM09, BP-MW03-EM09, BP-MW05-EM09,BP-MW07-EM09,BP-MW09-EM09,MW-K5-EM09
440-147905-1	CCB	SW6020	Antimony	0.509	ug/L	BP-MW01-EM10,BP-MW03-EM10,BP-MW05-EM10,BP-MW07-EM10,BP-MW09-EM10
440-147905-1	CCB	SW6020	Arsenic	0.658	ug/L	BP-MW01-EM10,BP-MW03-EM10,BP-MW05-EM10,BP-MW07-EM10,BP-MW09-EM10
440-155093-1	CCB	E300.0	Chloride	0.436	ug/L	BP-MW04-EM11,BP-MW07-EM11,BP-MW08-EM11
440-155093-1	ICB/CCB	SW6010B	Aluminum	0.0529	mg/l	BP-MW02-EM11,BP-MW02-EM11-FD,BP-MW04-EM11,BP-MW07-EM11,BP-MW08-EM11,BP-MW09-EM11
440-155093-1	ICB/CCB	SW6010B	Lead	0.0047	mg/l	BP-MW02-EM11,BP-MW02-EM11-FD,BP-MW04-EM11,BP-MW07-EM11,BP-MW08-EM11,BP-MW09-EM11
440-155093-1	ICB/CCB	SW6010B	Strontium	0.319	mg/l	BP-MW02-EM11,BP-MW02-EM11-FD,BP-MW04-EM11,BP-MW07-EM11,BP-MW08-EM11,BP-MW09-EM11
440-155280-1	ICB/CCB	SW6010B	Aluminum	0.0657	mg/l	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11
440-155280-1	ICB	SW6010B	Silver	0.00845	mg/l	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11
440-155280-1	CCB	SW6010B	Iron	0.0136	mg/l	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11
440-155280-1	CCB	SW6010B	Magnesium	0.014	mg/l	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11
440-155280-1	CCB	SW6010B	Sodium	0.396	mg/l	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11
440-155522-1	ICB	SW6010B	Silver	0.00845	mg/l	BH-01-EM11,MW-K5-EM11,PC-98R-EM11
440-155522-1	CCB	SW6010B	Iron	0.0136	mg/l	BH-01-EM11
440-155522-1	CCB	SW6010B	Magnesium	0.014	mg/l	BH-01-EM11
440-155522-1	CCB	SW6010B	Sodium	0.396	mg/l	BH-01-EM11,MW-K5-EM11,PC-98R-EM11

Table 15 Method Blank Detections

SDG	SampleID	Method	Analyte	Result	Units	Associated Samples
440-107289-1	MB 440-250167/1-B	SW6010B	Calcium	0.0618	mg/L	BHW-1-0-201504
440-119195-1	MB 440-277177/1-A ^5	SW6010B	Calcium	30.2	mg/kg	BP-IW02-A,BP-IW02-B,BP-IW02-B-FD,BP-IW02-C,BP-MW05-A,BP-MW05-B,BP-MW08-A,BP-MW08-B,BP-MW08-C
440-122031-1	MB 440-283590/1-A	SW6010B	Iron	0.0173	mg/L	BP-MW02-EMBL,BP-MW08-EMBL
440-122317-1	MB 440-283590/1-A	SW6010B	Iron	0.0173	mg/L	BP-MW06-EMBL,BP-IW01-EMBL,BP-MW07-EMBL,BP-IW02-EMBL,BP-MW09-EMBL,BP-IW03-EMBL
440-132568-1	MB 440-303665/1-A	SW6010B	Iron	0.0205	mg/L	BP-MW01-EM04,BP-MW03-EM04,BP-MW05-EM04,BP-MW07-EM04,BP-MW09-EM04,FIELD QC EM04-FB,FIELD QC-EM04-EB
440-134828-1	MB 440-306048/1-A	SW6010B	Iron	0.0263	mg/L	BP-MW06-EM05,BP-MW07-EM05,BP-MW07-EM05-FD
440-136058-1	MB 440-308614/1-A	SW6010B	Lead	0.00406	mg/L	FIELDQC-EM06-EB,FIELDQC-EM06-FB
440-136337-1	MB 440-309213/1-A	SW6010B	Zinc	0.0285	mg/L	BP-MW01-EM06,BP-MW03-EM06,BP-MW04-EM06,BP-MW08-EM06
440-139059-1	MB 440-314121/1-A	SW6010B	Magnesium	0.0149	mg/L	BP-MW02-EM07, BP-MW02-EM07-FD
440-142130-1	MB 440-320991/1-A	SW6010B	Boron	0.011	mg/L	BP-MW08-EM08,FIELDQC-EM08-EB,FIELDQC-EM08-FB
440-142440-1	MB 440-321134/1-A	SW6010B	Iron	0.0245	mg/L	BP-MW03-EM08,BP-MW04-EM08,BP-MW06-EM08,BP-MW07-EM08
440-147621-1	MB 440-332163/1-A	SW6010B	Iron	0.034	mg/L	BP-MW04-EM10,FIELD QC EM10-EB,FIELD QC-EM10-FB
440-147753-1	MB 440-332163/1-A	SW6010B	Iron	0.034	mg/L	BP-MW02-EM10, BP-MW08-EM10
440-147905-1	MB 440-332163/1-A	SW6010B	Iron	0.034	mg/L	BP-MW01-EM10,BP-MW05-EM10, BP-MW09-EM10
440-154949-1	MB 440-348826/1-A	SW6010B	Boron	0.0148	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-154949-1	MB 440-348826/1-A	SW6010B	Calcium	0.0661	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-154949-1	MB 440-348826/1-A	SW6010B	Iron	0.0184	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-154949-1	MB 440-348826/1-A	SW6010B	Magnesium	0.0161	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-154949-1	MB 440-348826/1-A	SW6010B	Silicon	0.0392	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-154949-1	MB 440-348826/1-A	SW6010B	Sodium	0.45	mg/L	FIELDQC-EM11-EB, FIELDQC-EM11-FB
440-155093-1	MB 440-349915/1-A	SW6010B	Aluminum	0.0493	mg/L	BP-MW02-EM11,BP-MW02-EM11-FD,BP-MW04-EM11,BP-MW07-EM11,BP-MW08-EM11,BP-MW09-EM11
440-155280-1	MB 440-350185/1-A	SW6010B	Aluminum	0.07	mg/L	BP-MW01-EM11,BP-MW03-EM11,BP-MW05-EM11,BP-MW06-EM11

Table 16 Equipment and Field Blank Detections

SampleID	Blank Type	Sample Date	Method	Total or Dissolved	Analyte	LQ	Result	Units	Associated Samples
FIELD QC-EMBL-EB	EB	9/22/15	E365.3	Total	Phosphorus	J	0.043	mg/L	All samples in round EMBL
FIELD QC-EMBL-EB	EB	9/22/15	RSK175	N/A	Methane	J	0.00046	mg/L	All samples in round EMBL
FIELD QC-EMBL-EB	EB	9/22/15	SW6010B	Dissolved	Calcium		0.13	mg/L	All samples in round EMBL
FIELD QC-EMBL-EB	EB	9/22/15	SW6010B	Dissolved	Magnesium		0.021	mg/L	All samples in round EMBL
FIELD QC-EMBL-EB	EB	9/22/15	SW6010B	Dissolved	Silicon		0.11	mg/L	All samples in round EMBL
FIELD QC-EMBL-EB	EB	9/22/15	SW6010B	Dissolved	Sodium	J	0.3	mg/L	All samples in round EMBL
FIELDQC-EMBL-FB	FB	9/23/15	E300.0	N/A	Chloride	J	0.3	mg/L	All samples in round EMBL
FIELDQC-EMBL-FB	FB	9/23/15	E300.0	N/A	Sulfate		0.51	mg/L	All samples in round EMBL
FIELDQC-EM02-EB	EB	12/15/15	E351.2	Total	Total Kjeldahl Nitrogen	J	0.19	mg/L	All samples in round EM02
FIELD QC-EM04-EB	EB	12/29/15	E314.0	N/A	Perchlorate	J	3.9	ug/L	All samples in round EM04
FIELD QC-EM04-EB	EB	12/29/15	SW6010B	Total	Iron	B	0.1	mg/L	All samples in round EM04
FIELDQC-EM06-FB	FB	1/25/16	E300.0	N/A	Chloride	J	0.33	mg/L	All samples in round EM06
FIELDQC-EM06-FB	FB	1/25/16	E300.0	N/A	Nitrate as N	J	0.066	mg/L	All samples in round EM06
FIELDQC-EM06-FB	FB	1/25/16	SM2540C	Total	Total Dissolved Solids	J	6	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	E300.0	N/A	Chloride	J	0.34	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	E300.0	N/A	Nitrate as N		0.19	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	RSK175	N/A	Methane	J	0.00037	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SM2540C	Total	Total Dissolved Solids		12	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Aluminum	J	0.045	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Calcium		0.18	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Iron	J	0.027	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Total	Iron		0.12	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Magnesium		0.024	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Silicon	J	0.046	mg/L	All samples in round EM06
FIELDQC-EM06-EB	EB	1/25/16	SW6010B	Dissolved	Sodium	J	0.43	mg/L	All samples in round EM06
FIELDQC-EM07-EB	EB	2/22/16	SW6010B	Dissolved	Calcium	J	0.053	mg/L	All samples in round EM07
FIELDQC-EM07-EB	EB	2/22/16	SW6010B	Dissolved	Magnesium	J	0.011	mg/L	All samples in round EM07
FIELDQC-EM07-FB	FB	2/22/16	E365.3	Total	Phosphorus	J	0.044	mg/L	All samples in round EM07
FIELDQC-EM08-EB	EB	3/21/16	E300.0	N/A	Chloride	J	0.34	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	E314.0	N/A	Perchlorate	J	1.5	ug/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	RSK175	N/A	Methane	J	0.00039	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Aluminum	J	0.032	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Boron	JB	0.018	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Calcium		0.49	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Iron	J	0.014	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Magnesium		0.23	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Silicon		0.11	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Sodium		1.1	mg/L	All samples in round EM08
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Strontium	J	0.011	mg/L	All samples in round EM08

Table 16 Equipment and Field Blank Detections

SampleID	Blank Type	Sample Date	Method	Total or Dissolved	Analyte	LQ	Result	Units	Associated Samples
FIELDQC-EM08-EB	EB	3/21/16	SW6010B	Dissolved	Zinc	J	0.017	mg/L	All samples in round EM08
FIELDQC-EM08-FB	FB	3/21/16	E300.0	N/A	Chloride	J	0.32	mg/L	All samples in round EM08
FIELDQC-EM08-FB	FB	3/21/16	E300.0	N/A	Nitrate as N	J	0.088	mg/L	All samples in round EM08
FIELDQC-EM08-FB	FB	3/21/16	SW6010B	Dissolved	Aluminum	J	0.038	mg/L	All samples in round EM08
FIELDQC-EM08-FB	FB	3/21/16	SW6010B	Dissolved	Boron	JB	0.02	mg/L	All samples in round EM08
FIELDQC-EM08-FB	FB	3/21/16	VFA	Total	Acetic acid	J	0.97	mg/L	All samples in round EM08
FIELDQC-EM09-EB	EB	4/20/16	E300.0	N/A	Chloride	J	0.31	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	E300.0	N/A	Sulfate	J	0.27	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	RSK175	N/A	Methane	J	0.00048	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	SW6010B	Dissolved	Calcium	J	0.083	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	SW6010B	Dissolved	Iron	J	0.011	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	SW6010B	Total	Iron	J	0.015	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	SW6010B	Dissolved	Magnesium	J	0.013	mg/L	All samples in round EM09
FIELDQC-EM09-EB	EB	4/20/16	SW6010B	Dissolved	Silicon	J	0.04	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	E300.0	N/A	Chloride	J	0.27	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	E300.0	N/A	Nitrate as N	J	0.094	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	SW6010B	Dissolved	Boron	J	0.015	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	SW6010B	Dissolved	Chromium		0.012	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	SW6010B	Dissolved	Iron		0.084	mg/L	All samples in round EM09
FIELDQC-EM09-FB	FB	4/20/16	SW6010B	Dissolved	Nickel	J	0.0075	mg/L	All samples in round EM09
FIELD QC EM10-EB	EB	5/16/16	RSK175	N/A	Methane	J	0.00097	mg/L	All samples in round EM10
FIELD QC EM10-EB	EB	5/16/16	SW6010B	Dissolved	Calcium		0.1	mg/L	All samples in round EM10
FIELD QC EM10-EB	EB	5/16/16	SW6010B	Dissolved	Silicon		0.32	mg/L	All samples in round EM10
FIELD QC EM10-EB	EB	5/16/16	SW6010B	Dissolved	Sodium	J	0.47	mg/L	All samples in round EM10
FIELDQC-EM11-FB	FB	8/8/16	SW6010B	Dissolved	Aluminum	J	0.031	mg/L	All samples in round EM11
FIELDQC-EM11-FB	FB	8/8/16	SW6010B	Dissolved	Iron	JB	0.011	mg/L	All samples in round EM11
FIELDQC-EM11-FB	FB	8/8/16	SW6010B	Total	Iron	J	0.031	mg/L	All samples in round EM11
FIELDQC-EM11-FB	FB	8/8/16	SW6010B	Dissolved	Silicon	JB	0.033	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	RSK175	N/A	Methane	J	0.0005	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	SW6010B	Dissolved	Calcium	B	0.1	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	SW6010B	Dissolved	Magnesium	JB	0.012	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	SW6010B	Dissolved	Silicon	JB	0.026	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	SW6010B	Dissolved	Sodium	B	0.7	mg/L	All samples in round EM11
FIELDQC-EM11-EB	EB	8/8/16	SW6010B	Dissolved	Zinc		0.022	mg/L	All samples in round EM11

Appendix F.1
Data Verification and Validation Summary Reports

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 2
SDG/Report No.: 440-107257-1/2
Lab ID: Test America – Irvine/Buffalo
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Interference Check Samples	X		No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Duplicates		X	No	None

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as reported.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BHW-1-201504	440-107257-1	4/14/2015	2.8 °C, 3.1°C
MW-K5-201504	440-107257-2	4/15/2015	2.8 °C, 3.1°C
MW-K5-201504-MS	440-107257-2MS	4/15/2015	2.8 °C, 3.1°C
MW-K5-201504-MSD	440-107257-2MSD	4/15/2015	2.8 °C, 3.1°C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Notes: Sample number listed on COC was BHW-1-20150415 and differed from the sample label.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium was detected in MB 440-277177/1-A ^5 at 30.2 mg/kg. Concentrations in the samples were > 10x the amount in the blank. No qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
The field provided MS/MSD sample aliquot for 314.0 analysis only.	
300.0: MS/MSD ran on an unrelated sample. Nitrite recoveries were high. Sulfate recoveries were low. Project data not affected.	
6010B: Recoveries were outside limits for calcium, sodium, and silicon. Concentrations in the parent sample were >4x the amount spiked. No qualification needed.	
VFA: MS/MSD ran on an unrelated sample. Recoveries were outside limits for all. Project data not affected.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	N/A/No
Notes: Level II data package does not provide ICS data. Case narrative states that "The interference check standard (ICSAB) failed high for Silver in analytical batch 250304. The following associated sample was ND, therefore the data was not impacted: MW-K5-201504 (440-107257-2)." No qualification was applied.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Duplicates	
Were any duplicate pairs analyzed in this SDG? Were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates?	Yes/Yes

Validated by: Maureen McMyler 08/17/16 (revised 04/26/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 4
SDG/Report No.: 440-107289-1
Lab ID: Test America - Irvine
Matrix: Soil (2); Soil QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds	---	---	---	---
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Interference Check Samples		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Duplicates	X		Yes	BHW-1-0-201504 and BHW-1-0-201504-FD: Qualify perchlorate "J".

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BHW-1-0-201504	440-107289-1	04/16/15	3.1 ºC
BHW-1-0-201504-MS	440-107289-1 MS	04/16/15	3.1 ºC
BHW-1-0-201504-MSD	440-107289-1 MSD	04/16/15	3.1 ºC
BHW-1-0-201504-FD	440-107289-2	04/16/15	3.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium was detected in MB 440-250167/1-B at 0.0618 mg/l. Concentrations in the samples were > 10x the amount in the blank. No qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A
Notes: Analyzed methods do not require surrogates	

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
COC requested MS/MSD for perchlorate only.	
314.0: MS/MSD ran on BHW-1-0-201504. MS recovery was low at 64% (80-120%). Concentration in the parent sample was >4x the amount spiked.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/N/A
BHW-1-0-201504 and BHW-1-0-201504-FD used as REG/FD pair for perchlorate only. Perchlorate RPD was 46.9%. Results will be qualified “J” in both samples.	

Validated by: Maureen McMyler 08/10/16 (revised 04/28/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 5
SDG/Report No.: 440-108121-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (3); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody	X		No	None
3. Holding Times	X		Yes	BHW-1-20150427 and PC-98R-20150427: Qualify hexavalent chromium “UJ” and "J-", respectively.
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	BHW-1-20150427 and PC-98R-20150427: Qualify bromide and nitrate “J-”.
7. Laboratory Control Samples		X	No	None
8. Interference Check Samples	---	---	---	---
9. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL “J”.
10. Duplicates		X	No	None

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified “J” or “J-“are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
BHW-1-20150427	440-108121-1	04/27/15	0.9 °C, 1.2 °C, 1.4 °C, 2.7 °C, 4.6 °C
PC-98R-20150427	440-108121-2	04/27/15	0.9 °C, 1.2 °C, 1.4 °C, 2.7 °C, 4.6 °C
PC-98R-20150427-FD	440-108121-3	04/27/15	0.9 °C, 1.2 °C, 1.4 °C, 2.7 °C, 4.6 °C
FIELDQC-20150427-EB	440-108121-4	04/27/15	0.9 °C, 1.2 °C, 1.4 °C, 2.7 °C, 4.6 °C
FIELDQC-20150427-FB	440-108121-5	04/27/15	0.9 °C, 1.2 °C, 1.4 °C, 2.7 °C, 4.6 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
Cooler temperatures at receipt were 0.9 ºC, 1.2 ºC, 1.4 ºC. No qualification.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/No
Note: The container sample time did not match the COC time for FIELDQC-20150427-EB and FIELDQC-20150427-FB. The lab logged in the samples per the COC. An additional analysis (Total Iron by 6010B) was requested after samples were sent to the lab and was not on the COC. Documentation is in the lab report.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
7199: BHW-1-20150427 and PC-98R-20150427 were analyzed outside holding time for hexavalent chromium.	

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No
Note: EB and FB analyzed for perchlorate only.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BHW-1-0-20150427. Recoveries were low for bromide, chloride, and nitrate and not reported for sulfate. The concentration of chloride in the parent sample was >4x the amount spike. No qualification is needed for chloride. Based on field readings and other lab results, PC-98R-20150427 is considered matrix-similar and will be qualified also.	
6010B: MS/MSD ran on an unrelated sample. Several recoveries were outside limits. Project data are not affected.	
RSK-175: MS/MSD not analyzed. Lab ran LCS/LCSD instead.	
VFA: MSD not analyzed. MS ran on an unrelated sample. Pyruvic Acid was not detected in one run. Propionic acid recovery was high in the other run. Project data are not affected.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	N/A
ICS information not provided in Level II package.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

10. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
PC-98R-20150427 and PC-98R-20150427-FD used as REG/FD pair for perchlorate only. RPD = 3.2%	

Validated by: Maureen McMyler 08/11/16 (revised 04/24/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 9
SDG/Report No.: 440-119195-1
Lab ID: Test America - Irvine
Matrix: Soil

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds	---	---	---	---
6. Matrix Spike/Matrix Spike Duplicate	X		No	BP-MW08-B: Qualify calcium and iron "J".
7. Laboratory Control Samples		X	No	None
8. Interference Check Samples	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	No	None
10. Duplicates		X	No	None

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW05-A	440-119195-1	8/24/2015	2.7 ºC, 2.9 ºC
BP-MW05-B	440-119195-2	8/24/2015	2.7 ºC, 2.9 ºC
BP-MW08-A	440-119195-3	8/24/2015	2.7 ºC, 2.9 ºC
BP-MW08-B	440-119195-4	8/24/2015	2.7 ºC, 2.9 ºC
BP-MW08-C	440-119195-5	8/25/2015	2.7 ºC, 2.9 ºC
BP-IW02-A	440-119195-6	8/25/2015	2.7 ºC, 2.9 ºC
BP-IW02-B	440-119195-7	8/25/2015	2.7 ºC, 2.9 ºC
BP-IW02-B-FD	440-119195-8	8/25/2015	2.7 ºC, 2.9 ºC
BP-IW02-C	440-119195-9	8/25/2015	2.7 ºC, 2.9 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium was detected in MB 440-277177/1-A ^5 at 30.2 mg/kg. Concentrations in the samples were > 10x the amount in the blank. No qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A
Notes: Analyzed methods do not require surrogates	

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
6010B: MS/MSD ran on BP-MW08-B. Recoveries and RPDs were outside limits for calcium (409% and 902%) and iron (-1147% and 9230%). The concentrations in the samples were >4x the amount spiked, so recovery criteria do not apply. Calcium and iron in BP-MW08-B will be qualified for imprecision.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	N/A
Notes: Level II data package does not provide ICS data.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
BP-IW02-B and BP-IW02-B-FD used as REG/FD pair.	

Validated by: Maureen McMyler 08/17/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 2
SDG/Report No.: 440-122031-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times	X		No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW02-EMBL: Qualify formic-acid, n-butyric acid, and pyruvic acid "UJ"; qualify lactic acid and pyruvic acid "R". BP-MW08-EMBL: Qualify pyruvic acid "R".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results qualified "R" are not useable. Sample results qualified estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW08-EMBL	440-122031-1	9/21/15	2.4 ºC, 2.5 ºC, 3.7 ºC
BP-MW02-EMBL	440-122031-2	9/21/15	2.4 ºC, 2.5 ºC, 3.7 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes
Notes:	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Notes:	

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	No
7199: BP-MW02-EMBL was analyzed twice, once outside of holding time. The concentration outside of holding time was higher, but would be considered estimated. Use the original run without qualification.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes
Notes:	

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes
Notes:	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in MB 440-283590/1-A. It was not detected in the samples. Detections in equipment blank FIELD QC-EMBL-EB in SDG 440-122171-1 include the following metals: calcium, magnesium, silicon, and sodium. Concentrations in the samples were > 10X the amount in the blanks. No qualification is needed.	
E300.0: The continuing calibration blank (CCB) for analytical batch 440-281591 contained chloride above the method detection limit (MDL). Chloride and sulfate were detected in field blank FIELDQC-EMBL-FB in SDG 440-122317-1. The concentrations in the samples were > 10X the amount in the blanks. No qualification is needed.	
E365.3: Phosphorous was detected in equipment blank FIELD QC-EMBL-EB in 440-122171. It was not detected in the samples.	
RSK-175: Methane (FID) was detected in equipment blank FIELD QC-EMBL-EB in 440-122171. It was not detected in the samples.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
E300: MS/MSDs ran on unrelated samples. MSD recoveries were low for nitrate and sulfate, but concentrations were >4x the amount spiked. Recoveries were high for nitrite. Project data are not affected. No qualification.	
6010B: MS/MSD ran on unrelated samples. In batch 440-283361, manganese MSD recovery was low, but concentration >4x the amount spiked. In batch 440-283590 calcium, magnesium, silicon, and sodium (MSD only) recoveries were low. Project data are not affected. No qualification.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA: The MS/MSD recoveries for batch 265307 were outside control limits for fatty acids. MS analyzed only on BP-MW02-EMBL. Recoveries low for formic-acid, lactic acid, n-butyric Acid, and pyruvic acid. Recovery high for propionic acid. Propionic acid was not detected in the parent sample, so there can be no high bias. MS/MSD ran for pyruvic acid only on BP-MW08-EMBL - both low.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes
Notes:	

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: ICSA 440-283613/7: metals detected above the |MDL|: barium, boron, cobalt, potassium, silicon, sodium, tin, vanadium, and zinc. The interferents (aluminum, calcium, iron, magnesium) are not present at high enough concentrations in the field samples to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/N/A
6020: Sample used for analysis was from a different work order. No detections, so %D was not calculated.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
6010B: CRQL check standard shows Found is ND for Tungsten, but has %R of 84%. Spiked amount is less than MDL. No qualification is needed.	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab duplicates only.	

Validated by: Maureen McMyler 12/14/15 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 6
SDG/Report No.: 440-122171-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (5); Water QC (1)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	MW-K5-EMB: Qualify chlorite "R" and chlorate "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times	X		No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW05-EMBL: Qualify total phosphorous “J”.
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BH-1-EMBL: Qualify nitrate “J”.
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL “J”.
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results qualified “R” are not useable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-1-EMBL	440-122171-1	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC
BP-MW05-EMBL	440-122171-2	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC
BP-MW05-EMBL-FD	440-122171-3	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC
BP-MW01-EMBL	440-122171-4	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC
MW-K5-EMBL	440-122171-5	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC
FIELDQC-EMBL-EB	440-122171-6	9/22/15	2.6 ºC, 2.8 ºC, 3.1 ºC, 3.3 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
E300.1B: The field did not provide a chlorite/chlorate aliquot for sample MW-K5-EMBL. An unpreserved aliquot was taken from another bottle. Preservative was added by the lab.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Notes: The field did not provide a chlorite/chlorate aliquot (300.1B) for sample MW-K5-EMBL.	

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	No
7199: BP-MW01-EMBL analyzed twice, once outside of holding time. The results and dilution were the same. Used the first run with no qualification.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Detections in FIELD QC-EMBL-EB include the following metals: calcium, magnesium, sodium, and silicon. Concentrations in the samples were >10x the concentration found in the EB. No qualification is needed. Iron detected in method blank MB 440-283590/1-A at 0.0173 mg/L. Iron was not detected in the associated samples. No qualification is needed.	
E300: Chloride and sulfate were detected in FIELDQC-EMBL-FB in SDG 440-122317. The concentrations in the samples were > 10x the amount in the FB. No qualification is needed.	
E365.3: Total phosphorus was detected in FIELD QC-EMBL-EB. It was detected in BP-MW05-EMBL at a lower concentration. Phosphorous should be considered estimated in BP-MW05-EMBL and qualified "J".	
RSK-175: Methane was detected in FIELD QC-EMBL-EB. It was not detected in the associated samples. No qualification is needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/ Yes/ Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
6010B: MS/MSD ran on an unrelated sample. Recoveries low for calcium, magnesium, silicon, and sodium (MSD only). Concentration in parent sample >4x the amount spiked for calcium, magnesium, and sodium. Project data are not affected.	
E300: The following recoveries were outside limits in the MS/MSD of BH-1-EMBL: bromide (high in MS), chloride (low), nitrate (low), sulfate (low). Concentration in the sample was >4x the amount spiked for chloride and sulfate, so recoveries do not apply. Bromide and chloride were not requested for the parent sample. Nitrate will be qualified "J" in BH-1-EMBL. The lab reported nitrate twice, one at a high dilution. Both results will be estimated, so higher concentration was chosen. Nitrite recovery was high in the MS/MSD of MW-K5-EMBL. Nitrite was not detected in the parent sample, so there can be no high bias. Sulfate recovery was not evaluated due to high concentrations in MW-K5-EMBL.	
E300.1B: MS/MSD ran on unrelated sample. Chlorite MS recovery was low. Project data are not affected.	
VFA-IC: MS/MSD ran on samples from different work orders. Several recoveries and RPDs were outside limits. No qualification is needed in this work order.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes.
6010B: ICSA 440-284233/7: metals detected above the |MDL|: barium, boron, cobalt, potassium, silicon, sodium, tin, vanadium, and zinc. The interferents (aluminum, calcium, iron, magnesium) are not present at high enough concentrations in the field samples to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/N/A
Notes: Unrelated sample from a different work order was used for analysis. No detections.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the RL are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes
Aluminum was detected at 0.14 mg/L (MDL is 0.13 mg/L) in BP-MW05-EMBL-FD, but not in BP-MW05-EMBL. Bromide was detected at 3.7 mg/L in BP-MW05-EMBL, but not in BP-MW05-EMBL-FD. The MDL is 2.5 mg/L. Total phosphorus was detected at 0.029 mg/L in BP-MW05-EMBL, but not in BP-MW05-EMBL-FD. The detection in BP-MW05-EMBL may be attributed to contamination.	

Validated by: Maureen McMyler 12/14/15 (revised 05/04/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 7
SDG/Report No.: 440-122317-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (6); Water QC (1)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks	X		Yes	BP-MW09-EMBL: Qualify iron "J". BP-MW07-EMBL: Qualify total phosphorous "J". BP-MW06-EMBL: Qualify total phosphorous "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-IW03-EMBL: Qualify acetic acid, formic-acid, n-butyric acid, and propionic acid "UJ" and lactic acid "R".
9. Laboratory Control Samples	X		No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results qualified "R" are not useable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW06-EMBL	440-122317-1	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
BP-IW01-EMBL	440-122317-2	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
BP-MW07-EMBL	440-122317-3	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
BP-IW02-EMBL	440-122317-4	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
BP-MW09-EMBL	440-122317-5	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
BP-IW03-EMBL	440-122317-6	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC
FIELDQC-EMBL-FB	440-122317-7	9/23/15	2.8 ºC, 3.7 ºC, 4.3 ºC, 4.5 ºC, 4.8 ºC, 5.5 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes
Notes:	

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) or recoveries within method requirements?	Yes/Yes/No
VFA-IC: Pyruvic acid recovery was high in CCV associated with batch 480-266013. Pyruvic acid was not detected in the samples, so there can be no high bias. Since the samples were analyzed by IC (typically inorganic), associated samples BP-MW06-EMBL, BP-IW01-EMBL, BP-MW07-EMBL, BP-IW02-EMBL, BP-MW09-EMBL, BP-IW03-EMBL, and FIELDQC-EMBL-FB will not be qualified per inorganic NFG.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in the method blank MB 440-283590/1-A. Aluminum was detected in calibration blanks (10/2/15), but was not detected in bracketed samples. Detections in FIELD QC-EMBL-EB in 440-122171-1 include the following metals: calcium, magnesium, sodium, and silicon. Concentrations in the samples were >10x the concentration found in the EB. No qualification is needed. Iron concentration in BP-MW09-EMBL is <5x the amount in the method blank. Iron in BP-MW09-EMBL will be qualified "J".	
E300: Chloride and sulfate were detected in FIELDQC-EMBL-FB. The concentrations in the samples were > 10x the amount in the FB. No qualification is needed.	
E365.3: Total phosphorus was detected in FIELD QC-EMBL-EB in 440-122171-1. It was detected in BP-MW07-EMBL at a lower concentration and in BP-MW06-EMBL above the RL. Phosphorous should be considered estimated in BP-MW07-EMBL and qualified "J" and estimated, biased high in BP-MW06-EMBL and qualified "J+".	
RSK-175: Methane was detected in FIELD QC-EMBL-EB. It was not detected in the associated samples. No qualification is needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/ Yes/ Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
6010B: MS/MSD ran on an unrelated sample. Recoveries were low for calcium, magnesium, silicon, and sodium (MSD only). Concentrations in the parent sample >4x the amount spiked for calcium, magnesium, and sodium. Project data are not affected. No qualification.	
E300.0: In analytical batch 440-282207, MS/MSD recoveries were not reported for chloride and sulfate. Concentrations in the sample BP-MW06-EMBL were >4x the amount spiked. Accuracy and precision criteria are not applicable.	
VFA-IC: MS only ran on BP-IW03-EMBL. Recoveries were low for acetic acid, formic-acid, lactic acid, n-butyric acid, and propionic acid. All will be qualified "UJ" in BP-IW03-EMBL. MS only ran on FIELDQC-EMBL-FB. Recoveries were high for pyruvic acid. No qualification because parent sample was ND. Additional MSD data provided from another work order with some recoveries out. No qualification.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/No
VFA-IC: Pyruvic acid recovery was high in LCS associated with batch 480-266013. Pyruvic acid was not detected in the samples, so there can be no high bias. No qualification needed.	

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: ICSA 440-284233/7: metals detected above the |MDL|: barium, boron, cobalt, potassium, silicon, sodium, tin, vanadium, and zinc. The interferents (aluminum, calcium, iron, magnesium) are not present at high enough concentrations in the field samples to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/N/A
Notes: Sample used for analysis was from a different work order.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the RL are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab duplicates only.	

Validated by: Maureen McMyler 12/14/15 (revised 04/24/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 7
SDG/Report No.: 440-122387-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (3); Water QC (4)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks (Method and/or Field QC)	X		Yes	BP-MW04-EMBL and BP-MW03-EMBL: Qualify molybdenum "J+". BP-MW04-EMBL: Qualify antimony "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW03-EMBL and BP-MW04-EMBL: Qualify acetic acid, n-butyric acid, propionic acid, pyruvic acid, and TKN "UJ"; qualify nitrate "J-".
9. Laboratory Control Samples	X		No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW04-EMBL*	440-122387-1	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW04-EMBL-MS*	440-122387-1MS	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW04-EMBL-MSD*	440-122387-1MSD	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW04-EMBL*	440-122387-2	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW04-EMBL-MS*	440-122387-2MS	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW04-EMBL-MSD*	440-122387-2MSD	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC
BP-MW03-EMBL	440-122387-3	9/24/15	2.9 ºC, 2.9 ºC, 3.3 ºC

*Lab assigned two lab sample IDs

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes
Notes:	

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/No
VFA-IC: Pyruvic acid recoveries were high in CCVs associated with batch 480-266013. Pyruvic acid was not detected in the samples, so there can be no high bias. Per inorganic NFG, no qualification will be applied.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Molybdenum was detected in ICB 440-284274/6, analyzed on 10/2/15. Molybdenum results should be qualified "J+". Silicon was detected in CCB 440-285282/25, analyzed on 10/7/15. Silicon concentrations in the samples were >10x the amounts in the blanks. No qualification is needed. Detections in FIELD QC-EMBL-EB in 440-122171-1 include the following metals: calcium, magnesium, sodium, and silicon. Concentrations in the samples were >10x the concentration found in the EB. No qualification is needed.	
6020: Antimony was detected in ICB 440-285353/7 and CCB 440-285353/23, analyzed on 10/7/15. Antimony in BP-MW04-EMBL will be qualified "J".	
E300: Chloride and sulfate were detected in FIELDQC-EMBL-FB. The concentrations in the samples were > 10x the amount in the FB. No qualification is needed.	
E365.3: Total phosphorus was detected in FIELD QC-EMBL-EB in 440-122171-1. It was not detected in the samples in this work order.	
RSK-175: Methane was detected in FIELD QC-EMBL-EB. It was not detected in the associated samples. No qualification is needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/ Yes/ Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
6010B: MS/MSD recoveries were outside limits for calcium, magnesium, sodium, and strontium in analytical batch 440-284274. MS recovery was high for silicon in batch 440-285282. Concentrations in the parent sample BP-MW04-EMBL were >4x the amount spiked. Accuracy criteria are not applicable. No qualification is needed.	
E300.0: In analytical batch 440-282505 MS/MSD recoveries were low for nitrate. Nitrate will be qualified "J" in BP-MW04-EMBL and BP-MW03-EMBL (similar matrix based on field readings and lab results). In analytical batch 440-282894 MS/MSD recoveries for chloride and sulfate were below limits. Concentrations in the sample BP-MW04-EMBL were >4x the amount spiked. Accuracy criteria are not applicable.	
E300.1: MS/MSD ran on BP-MW04-EMBL. Recoveries were outside limits for chlorite and chlorate. Chlorite was not detected in the MS or MSD. The sample was diluted 50x. Chlorate recoveries were high. Chlorate concentrations in sample BP-MW04-EMBL were >4x the amount spiked. Accuracy criteria are not applicable. No qualification will be applied.	
E352.1: In analytical batch 440-285393, MS/MSD ran on BP-MW04-EMBL. Recoveries were low for Total Kjeldahl Nitrogen. TKN will be qualified "UJ" in BP-MW04-EMBL and BP-MW03-EMBL (similar matrix based on field readings and lab results).	
VFA-IC: MS/MSD ran on BP-MW04-EMBL. Recoveries were low for acetic acid, n-butyric acid, propionic acid, and pyruvic acid. All will be qualified "UJ" in BP-MW04-EMBL and BP-MW03-EMBL (similar matrix based on field readings and lab results). MS recovery and RPD were high for lactic acid, but it was not detected in the parent sample, so there can be no high bias or imprecision. Inorganic NFG does not MS RPD information, so defaulted to organic NFG.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/No
VFA-IC: Pyruvic acid recoveries were high in the LCS associated with batch 480-266013. Pyruvic acid was not detected in the samples, so there can be no high bias. No qualification is needed.	

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: ICSA 440-284274/7: metals detected above the |MDL|: barium, boron, chromium, lead, molybdenum, phosphorous, tin, vanadium, and zinc. The interferents (aluminum, calcium, iron, magnesium) are not present at high enough concentrations in the field samples to affect other results. No qualification is needed. According to the narrative, the ICSA recovery for batch 440-285282 was above the upper acceptance limit for lead. Lead was not detected in the associated samples. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the RL are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab duplicates only.	

Validated by: Maureen McMyler 12/14/15 (revised on 05/04/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 8
SDG/Report No.: 440-130250-1/2
Lab ID: Test America - Irvine
Matrix: Water (6); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	BP-MW01-EM01, BP-MW05-EM01, BP-MW05-EM01-FD: Qualify Dissolved Nitrate "J-". BP-MW03-EM01: Qualify Dissolved Nitrate "UJ".
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	Yes	None
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW01-EM01	440-130250-1	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW05-EM01	440-130250-2	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW05-EM01-MS	440-130250-2MS	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW05-EM01-MSD	440-130250-2MSD	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW05-EM01-FD	440-130250-3	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW03-EM01	440-130250-4	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW07-EM01	440-130250-5	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC
BP-MW09-EM01	440-130250-6	12/08/15	3.0 ºC, 3.6 ºC, 4.3 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
E300.0: For BP-MW01-EM01, BP-MW03-EM01, BP-MW05-EM01, and BP-MW05-EM01-FD, and BP-MW05-EM01-MS, BP-MW05-EM01-MSD dissolved nitrate was analyzed outside the 48-hour holding time.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.1B: MS/MSD ran on BP-MW05-EM01. Recoveries of chlorate were above acceptance limits. The concentration in the parent sample was >4X the amount spiked. Recovery criteria do not apply. Qualification is not needed. In batch 440-300938, MS/MSD ran on an unrelated sample. Recoveries of chlorite were low. Project data are not affected.	
314: MS/MSD ran on BP-MW05-EM01. Recoveries of perchlorate were above acceptance limits. The concentration in the parent sample was >4X the amount spiked. Recovery criteria do not apply. Qualification is not needed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes
Field duplicate pair: BP-MW05-EM01 and BP-MW05-EM01-FD	

Validated by: Maureen McMyler 01/05/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 4
SDG/Report No.: 440-131167-1/2
Lab ID: Test America - Irvine
Matrix: Water (2); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as reported.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
FIELDQC-EM02-FB	440-131167-1	12/15/15	1.6 ºC, 2.5 ºC
FIELDQC-EM02-EB	440-131167-2	12/15/15	1.6 ºC, 2.5 ºC
BP-MW09-EM02	440-131167-3	12/15/15	1.6 ºC, 2.5 ºC
BP-MW06-EM02	440-131167-4	12/15/15	1.6 ºC, 2.5 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
E351.2: Total Kjeldahl Nitrogen was detected in FIELDQC-EM02-EB. It was not detected in the samples.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.0: MS/MSD ran on an unrelated sample. Recoveries of nitrate were below acceptance limits. The concentration in the parent sample was > 4x the amount spiked. No qualification needed. Project data are not affected.	
300.1B: MS/MSD ran on an unrelated sample. MS recovery of chlorite was below acceptance limits. No qualification needed. Project data are not affected.	
365.3: MS/MSD ran on an unrelated sample. Recoveries of phosphorous were below acceptance limits. Project data are not affected. No qualification needed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
Results detected between the method detection limit and reporting limit are estimated and qualified "J".	

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Lab duplicate only.	

Validated by: Maureen McMyler 01/04/16 (revised 05/01/17)

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-131337-1/2
Project No.:	100-TEN-T35908	Lab ID:	Test America - Irvine
No. of Samples:	4 and MS/MSD	Matrix:	Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)	X		Yes	BP-MW03-EM02 and BP-MW07-EM02: Qualify TKN "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM02: Qualify phosphorous "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW07-EM02	440-131337-1	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC
BP-MW07-EM02-MS	440-131337-1MS	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC
BP-MW07-EM02-MSD	440-131337-1MSD	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC
BP-MW05-EM02	440-131337-2	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC
BP-MW03-EM02	440-131337-3	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC
BP-MW01-EM02	440-131337-4	12/16/15	1.3 ºC, 1.6 ºC, 2.2 ºC, 2.7 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
E351.2: Total Kjeldahl Nitrogen (TKN) was detected in FIELDQC-EM02-EB at 0.19 mg/L in job 440-131167. TKN was detected in BP-MW03-EM02 and BP-MW07-EM02 above the reporting limit and will be qualified as estimated. TKN was detected in calibration blank CCB 440-301581/16. It bracketed the MS/MSD pair only, so no qualification will be applied.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
365.3: MS/MSD ran on BP-MW07-EM02. Recoveries of phosphorous were below acceptance limits. Phosphorous result in BP-MW07-EM02 will be qualified "J"-.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A
6010B: Samples analyzed for Iron only.	

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
Results detected between the method detection limit and reporting limit are estimated and qualified "J".	

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/NA/N/A

Validated by: Maureen McMyler 01/05/16 (revised 05/09/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 3
SDG/Report No.: 440-131433-1
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW08-EM02: Qualify nitrate "J".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW04-EM02	440-131433-1	12/17/15	3.0 ºC
BP-MW02-EM02	440-131433-2	12/17/15	3.0 ºC
BP-MW08-EM02	440-131433-3	12/17/15	3.0 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.0: MS/MSD ran on BP-MW08-EM02. Nitrate and nitrite MSD recoveries and RPDs were above acceptance limits. Nitrite was not detected in the sample, so there can be no high bias or imprecision. Nitrate will be qualified "J".	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 01/05/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 9
SDG/Report No.: 440-131796-1
Lab ID: Test America - Irvine
Matrix: Water (7); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as reported.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW01-EM03	440-131796-1	12/21/15	2.3 ºC
BP-MW02-EM03	440-131796-2	12/21/15	2.3 ºC
BP-MW03-EM03	440-131796-3	12/21/15	2.3 ºC
BP-MW05-EM03	440-131796-4	12/21/15	2.3 ºC
BP-MW05-EM03-MS	440-131796-4MS	12/21/15	2.3 ºC
BP-MW05-EM03-MSD	440-131796-4MSD	12/21/15	2.3 ºC
BP-MW05-EM03-FD	440-131796-5	12/21/15	2.3 ºC
BP-MW07-EM03	440-131796-6	12/21/15	2.3 ºC
BP-MW09-EM03	440-131796-7	12/21/15	2.3 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.0: MS/MSD ran on BP-MW05-EM03. Sulfate recoveries were below acceptance limits. Sulfate concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply. No qualification is required. Lab applied the F1 qualifier to nitrate, however the low recovery was for nitrite, which was not requested.	
300.1B: MS/MSD ran on BP-MW05-EM03. Chlorate recoveries were above acceptance limits. Chlorate concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply. No qualification is required.	
314.0: MS/MSD ran on BP-MW05-EM03. Perchlorate recoveries were outside acceptance limits. Perchlorate concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply. No qualification is required.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes
Notes: FD pair is BP-MW05-EM03 and BP-MW05-EM03-FD.	

Validated by: Maureen McMyler 01/19/16 (revised 05/04/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 3
SDG/Report No.: 440-131951-1
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds	---	---	---	---
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
12. Duplicates	---	---	---	---

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW04-EM03	440-131951-1	12/22/15	5.0 ºC
BP-MW06-EM03	440-131951-2	12/22/15	5.0 ºC
BP-MW08-EM03	440-131951-3	12/22/15	5.0 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.0: MS/MSD ran on an unrelated sample and BP-MW08-EM03. Nitrate recoveries were below acceptance limits in the unrelated sample, but within limits in BP-MW08-EM03. No qualification is required.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
Results detected between the method detection limit and reporting limit are estimated and qualified "J".	

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 01/22/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 9
SDG/Report No.: 440-132568-1/2
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (5); Water QC (4)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	FIELDQC-EM04-EB, FIELDQC-EM04-FB: Qualify Total Nitrogen and Total Phosphorous "R".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration	X		No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW09-EM04: Qualify iron "J". BP-MW03-EM04, BP-MW05-EM04, BP-MW07-EM04, FIELDQC-EM04-EB: Qualify iron "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM04: Qualify propionic acid “J+”, TOC "J", and lactic acid "UJ".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL “J”.
12. Duplicates	---	----	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results rejected are unuseable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW01-EM04	440-132568-1	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW05-EM04	440-132568-2	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW07-EM04	440-132568-3	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW07-EM04-MS	440-132568-3MS	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW07-EM04-MSD	440-132568-3MSD	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW03-EM04	440-132568-4	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
FIELDQC-EM04-EB	440-132568-5	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
FIELDQC-EM04-FB	440-132568-6	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC
BP-MW09-EM04	440-132568-7	12/29/15	3.0 ºC, 3.8 ºC, 4.0 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
351.2: Field QC-EM04-EB and Field QC EM04-FB for Total Nitrogen were not preserved to pH ≤2 in the field. The samples were preserved at the lab.	
365.3: Field QC-EM04-EB and Field QC EM04-FB for Total Phosphorous were not preserved to pH ≤2 in the field. The samples were preserved at the lab.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes
351.2, 365.3, SM5310B, VFA-IC: ICAL data not provided.	

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
314.0: Perchlorate was detected in equipment blank FIELDQC-EM04-EB. Concentrations in the samples were > 10x the amount found in the EB or were not detected. No qualification is needed.	
6010B: Iron was detected in the method blank of prep batch 303665 below the RL and in equipment blank FIELDQC-EM04-EB above the RL. Iron result in BP-MW09-EM04 should be considered estimated. Iron results in BP-MW03-EM04, BP-MW05-EM04, BP-MW07-EM04, and FIELDQC-EM04-EB should be considered biased high.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM04. Recoveries of chloride were below acceptance limits. The concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. Recoveries of nitrite were high. Nitrite was not detected in the parent sample, so there can be no high bias. No qualification is needed.	
300.1B: MS/MSD ran on BP-MW07-EM04. Recoveries of chlorite were not evaluated because of sample dilution for matrix. Chlorite was not detected in the parent sample. Chlorate recoveries were within limits. No qualification is needed.	
SM5310B: MS/MSD not analyzed with batch 303537. LCSD ran instead. MS/MSD ran on BP-MW07-EM04. Recoveries of TOC were below lab control limits. TOC will be qualified "J-" in BP-MW07-EM04	
VFA-IC: MS/MSD ran on BP-MW07-EM04. Recoveries of propionic acid and pyruvic were above acceptance limits. Recoveries of lactic acid were below limits. Pyruvic acid was not detected in the parent sample, so there can be no high bias. Propionic acid and lactic acid will be qualified in BP-MW07-EM04. MS/MSD ran on BP-MW03-EM04 for pyruvic acid only. Recoveries were above acceptance limits. Pyruvic acid was not detected in the parent sample, so there can be no high bias. No qualification for BP-MW07-EM04.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 01/22/16 (revised 04/25/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 4
SDG/Report No.: 440-132679-1
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate		X	No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates	---	----	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as reported.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW08-EM04	440-132679-1	12/30/15	2.8 ºC, 2.9 ºC
BP-MW06-EM04	440-132679-2	12/30/15	2.8 ºC, 2.9 ºC
BP-MW02-EM04	440-132679-3	12/30/15	2.8 ºC, 2.9 ºC
BP-MW04-EM04	440-132679-4	12/30/15	2.8 ºC, 2.9 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4°C (+ or – 2°C)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes
SM5310B: ICAL data not provided.	

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/Yes

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 01/22/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 5
SDG/Report No.: 440-134828-1/2
Lab ID: Test America - Irvine
Matrix: Water (3); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-MW07-EM05 and BP-MW07-EM05-FD: Qualify TOC "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM05 and BP-MW07-EM05-FD: Qualify perchlorate "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW07-EM05	440-134828-1	1/12/16	3.1 ºC
BP-MW07-EM05-MS	440-134828-1MS	1/12/16	3.1 ºC
BP-MW07-EM05-MSD	440-134828-1MSD	1/12/16	3.1 ºC
BP-MW06-EM05	440-134828-2	1/12/16	3.1 ºC
BP-MW07-EM05-FD	440-134828-3	1/12/16	3.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
SM5310B: The following samples were not preserved to pH < 2: BP-MW07-EM05 and BP-MW07-EM05-FD. The lab adjusted the pH to <2 prior to analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in the method blank of prep batch 306048 and calibration blanks CCB 440-306516/13 and CCB 440-306620/13 below the RL. Iron concentrations in the samples are >10x the amount in the blanks. No qualification needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM05. Recoveries of sulfate were below acceptance limits. The concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.	
300.1B: MS/MSD ran on BP-MW07-EM05. Recoveries of chlorite were zero because of 50X sample dilution for matrix. Chlorite was not detected in the parent sample. Chlorate recoveries were within limits. No qualification is needed.	
314: MS/MSD ran on BP-MW07-EM05. Recoveries of perchlorate were low.	
RSK-175: MS/MSD not analyzed in batch 306651.	
SM 5310B: MS/MSD ran on BP-MW07-EM05. Recoveries of TOC were below acceptance limits. The concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A
6010B: Samples ran for total iron only.	

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL	Yes/Yes/Yes

Validated by: Maureen McMyler 01/28/16 (revised 05/01/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 7
SDG/Report No.: 440-135045-1/2
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW03-EM05	440-135045-1	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW08-EM05	440-135045-2	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW05-EM05	440-135045-3	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW09-EM05	440-135045-4	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW01-EM05	440-135045-5	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW02-EM05	440-135045-6	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC
BP-MW04-EM05	440-135045-7	1/13/16	1.8 ºC, 1.9 ºC, 2.2 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
ALL: Cooler temps were below 2 ºC.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
RSK-175: On the COC, sample BP-MW02-EM05 was marked for RSK-175 analysis, but no VOA vials were provided for the sample. VOA vials were received for sample BP-MW01-EM05. Sample BP-MW01-EM05 was logged for and analyzed for RSK-175.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW09-EM05. Data not evaluated for sulfate due to high concentration in the parent sample. Nitrate recoveries were within limits.	
300.1B: In batch 306561, MS/MSD ran on BP-MW03-EM05. Chlorate recoveries were below limits. Chlorate concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.	
6010B: Iron MS/MSD ran on an unrelated sample. MS recovery was high. Project data are not affected. No qualification is needed.	
RSK-175: MS/MSD not analyzed in batch 306900.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A
6010B:. Samples ran for total iron only.	

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 02/04/16

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 2
SDG/Report No.: 440-135159-1/2
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as reported.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-01-EM05	440-135159-1	1/14/16	1.1 ºC
MW-K5-EM05	440-135159-2	1/14/16	1.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
ALL: Cooler temp was below 2 ºC.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on MW-K5-EM05. Recoveries for sulfate were low. Sulfate concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed. Nitrate recoveries were within limits.	
300.1B: In batch 306561, MS/MSD ran on BH-01-EM05. Chlorate recoveries were below limits. Chlorate concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.	
6010B: Iron MS/MSD ran on an unrelated sample. MS recovery was high. Project data are not affected. No qualification is needed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A
6010B: Samples analyzed for total iron only.	

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 02/05/16

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 2
SDG/Report No.: 440-136058-1/2
Lab ID: Test America – Irvine/Buffalo
Matrix: Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Detections in the FB and EB may affect sample results found in other data packages.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
FIELDQC-EM06-FB	440-136058-1	1/25/16	0.6 ºC
FIELDQC-EM06-EB	440-136058-2	1/25/16	0.6 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
ALL: Cooler temp was below 2 ºC.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Nitrate and chloride was detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB.	
6010B: The following metals were detected in FIELDQC-EM06-EB: Dissolved aluminum, calcium, iron, magnesium, silicon, and sodium and total iron. Lead was detected in the MB of batch 308614 and in the following calibration blanks: ICB 440-308980/6, CCB 440-308980/13, ICB 440-309014/6, and CCB 440-309014/25. Lead was not detected in the samples.	
RSK-175: Methane was detected in FIELDQC-EM06-EB.	
SM 2540C: Total Dissolved Solids was detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/ Yes/ Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on an unrelated sample. Nitrite MS recovery was high. Project data are not affected.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on a sample from another work order. Recoveries were outside limits for acetic acid and pyruvic acid. Project data are not affected. No qualification is needed in this work order.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B/6020: Several metals were detected above the |MDL|. The interferents (aluminum, calcium, iron, magnesium) were detected in the EB, but not at high enough concentrations to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Unrelated sample from a different work order was used for analysis. No issues.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the RL are estimated and qualified "J".	
6010B: CRI 440-308980/11 has Tungsten as ND, but with %Recovery as 60%.	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab duplicates only	

Validated by: Maureen McMyler 05/01/17

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 8
SDG/Report No.: 440-136168-1/2
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (6); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-MW07-EM06: Qualify TOC "J-"
2. Chain-of-Custody		X	No	None
3. Holding Times	X		No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW02-EM06-FD: Qualify Al "J". BP-MW09-EM06: Qualify total Fe "J". BP-MW05-EM06, BP-MW06-EM06, BP-MW02-EM06, and BP-MW02-EM06-FD: Qualify total Fe "J+". BP-MW05-EM06, BP-MW02-EM06-FD: Qualify dissolved Fe "J". BP-MW06-EM06: Qualify dissolved Fe "J+". BP-MW06-EM06: Qualify methane "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM06: Qualify sulfate "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
14. Duplicates	X		Yes	BP-MW02-EM06 and BP-MW02-EM06-FD: Qualify dissolved iron "J" for detect and "UJ" for non-detect.

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW09-EM06	440-136168-1	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW07-EM06	440-136168-2	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW07-EM06-MS	440-136168-2MS	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW07-EM06-MSD	440-136168-2MSD	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW05-EM06	440-136168-3	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW04-EM06	440-136168-4	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW02-EM06	440-136168-5	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC
BP-MW02-EM06-FD	440-136168-6	01/26/2016	2.0 ºC, 2.4 ºC, 2.7 ºC, 2.8 ºC, 5.5 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
SM 5310B: BP-MW07-EM06 was not preserved to pH < 2. The lab preserved the sample before analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
7199: BP-MW07-EM06-MS and -MSD were analyzed outside the 24 hour holding time. No qualification is applied to MS/MSD data.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Nitrate and chloride were detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB in job 440-136058. The concentrations in the samples are >5x the amounts in the blank. No qualification is needed.	
6010B: The following metals were detected in FIELDQC-EM06-EB in job 440-136058: aluminum, calcium, iron (total and dissolved), magnesium, silicon, and sodium. Lead was detected in the MB of batch 308614 and in several calibration blanks. Lead was not detected in the samples. For metals with concentrations > 10x the amount in the EB, no action is needed.	
RSK-175: Methane was detected in FIELDQC-EM06-EB in job 440-136058.	
SM 2540C: Total Dissolved Solids was detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB in job 440-136058. Concentrations in the associated samples are too high to be affected. No qualification is needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM06. Recoveries for nitrite were high. Nitrite was not detected in the parent sample, so there can be no high bias. Sulfate recovery was low. Chloride was not evaluated because of high concentration in the parent sample.	

314.0: In batch 308847**,** MS/MSD ran on an unrelated sample. Perchlorate recoveries were above limits. Perchlorate concentration in the parent sample was > 4x the amount spiked. No qualification is needed.
6010B: MS/MSD ran on BP-MW07-EM06 and unrelated samples. Recoveries were outside limits for the following: calcium, magnesium, manganese, silicon, sodium, strontium (MSD), and tungsten (MSD – no recovery). Concentrations in the BP-MW07-EM06 were > 4x the amount spiked, except for tungsten. Recovery criteria are not applicable. The post-digestion spike recovery for tungsten was within limits. No qualification.
SM 5310B: MS/MSD ran on BP-MW07-EM06. MS recovery of TOC was high. TOC concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.
VFA-IC: MS/MSD ran on BP-MW07-EM06. Recoveries for pyruvic acid were high in batch 285431. Pyruvic acid was not detected in the parent sample, so there can be no high bias. No qualification is needed.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B/6020: Metals were detected above the MDLs. Concentrations of the interferents in the samples are not comparable. No qualification	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes:	

12. Internal Standards (IS)	
Is an IS Summary form present? Were at least five standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
Results detected between the method detection limit and reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/No
BP-MW02-EM06 and BP-MW02-EM06-FD were used for the FD pair. Chemical Oxygen Demand was detected in BP-MW02-EM06, but not in the FD. Dissolved aluminum, iron, titanium, and zinc were detected in BP-MW02-EM06-FD, but not the original.	

Validated by: Maureen McMyler 02/29/16 (revised 05/02/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 6
SDG/Report No.: 440-136337-1/2
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-IW01-EM06: Qualify TOC "J-". BP-MW03-EM06: Qualify COD "R".
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	BP-MW03-EM06, BP-MW04-EM06, and BP-MW08-EM06: Qualify chlorite "UJ".
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW01-EM06, BP-MW03-EM06, BP-MW04-EM06, and BP-MW08-EM06: Qualify total Fe "J+". BP-MW08-EM06: Qualify dissolved Fe "J+". BP-MW04-EM06: Qualify antimony "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW01-EM06: Qualify formic acid, lactic acid, and phosphorous "UJ".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards	X		Yes	BP-MW03-EM06 and BP-MW08-EM06: Qualify thallium "UJ".
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results qualified "R" are not useable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-IW01-EM06	440-136337-1	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C
BP-MW01-EM06	440-136337-2	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C
BP-MW03-EM06	440-136337-3	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C
BP-MW08-EM06	440-136337-4	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C
BP-MW04-EM06	440-136337-5	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C
BP-IW03-EM06	440-136337-6	01/27/2016	2.3 °C, 3.3 °C, 3.5 °C, 4.0 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
SM 5310B: The lab received BP-IW01-EM06 at a pH of 4. The method requires samples to be preserved to a pH<2. The lab added preservative to BP-IW01-EM06.	
SM 5220D: The lab received BP-MW03-EM06 at a pH of 7. The method requires samples to be preserved to a pH<2. The lab added preservative to BP-MW03-EM06.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
E300.1B: BP-MW03-EM06, BP-MW04-EM06, BP-MW08-EM06 were analyzed for chlorite outside the 14 day holding time.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Nitrate was detected in FIELDQC-EM06-EB (0.19 mg/L) and FIELDQC-EM06-FB (0.066 mg/L) in job 440-136058. Chloride was detected in calibration blank (CB) CCB440-308670/17. The concentrations in the samples are >5x the amounts in the blanks. No qualification is needed.	
6010B: The following metals were detected in FIELDQC-EM06-EB in job 440-136058: aluminum, calcium, iron (total and dissolved), magnesium, silicon, and sodium. Zinc was detected in the MB of batch 309213. Zinc was not detected in the samples. Boron was detected in CCB 440-309658/25. Lead was detected in ICB 440-309658/6.	
6020: Antimony was detected in CCB 440-309906/23. It was detected in BP-MW04-EM06 between the MDL and RL.	
RSK-175: Methane was detected in FIELDQC-EM06-EB in job 440-136058.	
SM 2540C: Total Dissolved Solids was detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB in job 440-136058.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW08-EM06. Recoveries for nitrite were high. Nitrite was not detected in the sample, so there can be no high bias. No qualification is needed. Sulfate and chloride recoveries were not evaluated because of high levels in the parent sample.	

314.0: In batch 308847**,** MS/MSD ran on an unrelated sample. Perchlorate recoveries were above limits. Perchlorate concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.
365.3: MS/MSD ran on BP-MW01-EM06. Recoveries for phosphorous were low and will be qualified "UJ" in BP-MW01-EM06.
SM 5310B: MS/MSD ran on BP-MW07-EM06 (440-136168). MS recovery of TOC was high. TOC concentration in the parent sample was > 4x the amount spiked. Recovery criteria are not applicable. No qualification is needed.
VFA-IC: MS/MSD ran on BP-MW01-EM06. Recoveries for pyruvic acid were high. Pyruvic acid was not detected in the sample, so there can be no high bias. No qualification is needed. Recoveries of formic acid and lactic acid were low and will be qualified "UJ" in the BP-MW01-EM06.
Notes: MS/MSD not analyzed for all methods.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: In ICSA 440-309658/7, several metals were detected above the |MDL|. The interferents (aluminum, calcium, iron, magnesium) are not present at high enough concentrations in the field samples to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/No/No
6020: Only three standards were evaluated in CCV 440-309906/33 on 2/3/16. %RI of Bi-209 was <60% in BP-MW03-EM06 and BP-MW08-EM06. Thallium is associated with Bi-209.	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/No
6010B: Tungsten was reported as ND in CQRL standards, but had a percent recovery associated with it. The MDL for Tungsten was 0.5 mg/L, but the amount in the CRQL check standard was 0.0200 mg/L. Tungsten recovery in CRI 440-309774/11 was -9%. The lab reported tungsten sample results from a different run.	
6020: The metals were reported as ND in a CQRL standard, but had percent recoveries shown. The MDLs were greater/higher than the amount in the CRQL check standard.	
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A

Validated by: Maureen McMyler 03/02/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-136507-1/2
Project No.:	100-TEN-T35908	Lab ID:	Test America - Irvine
No. of Samples:	4	Matrix:	Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)	X		No	None
7. Surrogates/Monitoring Compounds	---	---	N/A	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Compound Quantitation and Reporting Limits		X	No	None
12. Duplicates	---	---	N/A	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as reported.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-IW02-EM06	440-136507-1	01/28/2016	2.4 ºC
PC-98R-EM06	440-136507-2	01/28/2016	2.4 ºC
BH-01-EM06	440-136507-3	01/28/2016	2.4 ºC
MW-K5-EM06	440-136507-4	01/28/2016	2.4 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Nitrate was detected in FIELDQC-EM06-EB and FIELDQC-EM06-FB in 440-136058. Sulfate was detected in calibration blank CCB 440-308917/41. The concentrations in the samples were >5x the amount in the blanks. No qualification is needed.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A/ N/A/ N/A

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
300.0: MS/MSD ran on an unrelated sample. Sulfate recoveries were low. Project data are not affected.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/Yes

11. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

12. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

Validated by: Maureen McMyler 03/03/16

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-138886-1
Project No.:	100-TEN-T35908	Lab ID:	Test America – Irvine/Buffalo
No. of Samples:	2	Matrix:	Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Detections in the FB and EB may affect sample results found in other data packages.
Usability: All results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
FIELDQC-EM07-EB	440-138886-1	02/22/16	2.6 °C, 3.0 °C, 5.6 °C
FIELDQC-EM07-FB	440-138886-2	02/22/16	2.6 °C, 3.0 °C, 5.6 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples extracted and/or analyzed within acceptable holding time?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/No
6010B: Silicon % recovery was > 110% in CCV 440-315679/12 (112%) and CCV 440-315679/19 (111%). The samples were ND. Per inorganic NFG, no qualification is needed.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
365.3: Total phosphorous was detected in FIELDQC-EM07-FB.	
6010B: Dissolved calcium and magnesium were detected in FIELDQC-EM07-EB.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/ Yes/ Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on an unrelated sample. Sulfate recoveries low. Project data are not affected.	
351.2/6010B/6020/RSK175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on an unrelated sample. Recoveries were outside limits for lactic acid and propionic acid. Project data are not affected.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B/6020: Several metals were detected above the |MDL|. Some interferents (calcium, magnesium) were detected in the EB, but not all and not at high enough concentrations to affect other results. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/Yes/N/A

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the RL are estimated and qualified "J".	
6010B: CRI 440-316305/11 has Tungsten as ND, but with %Recovery as 110%.	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab duplicates only	

Validated by: Maureen McMyler 05/01/17

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-139059-1
Project No.:	100-TEN-T35908	Lab ID:	Test America – Irvine/Buffalo
No. of Samples:	8	Matrix:	Water (6); Water WC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks	X		Yes	BP-MW07-EM07: Qualify total phosphorous "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM07: Qualify chlorite "R".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards	X		No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Sample results qualified "R" are not useable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
PC-98R-EM07	440-139059-1	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW09-EM07	440-139059-2	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW07-EM07	440-139059-3	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW07-EM07-MS	440-139059-3MS	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW07-EM07-MSD	440-139059-3MSD	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW02-EM07	440-139059-4	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW02-EM07-FD	440-139059-5	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC
BP-MW04-EM07	440-139059-6	02/23/16	1.1 ºC, 2.7 ºC, 3.8 ºC, 3.0 ºC, 4.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
One cooler was received at 1.1 ºC.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) or percent recoveries ≤ method requirements?	No/Yes/No
6010B: The closing CCV for iron in CCV 440-315289/26 (03/03/2016 21:28) was high at 114%. Dissolved iron was not detected in BP-MW04-EM07. Per inorganic NFG, no qualification is needed.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
365.3: Phosphorous was detected in FIELDQC-EM07-FB in 440-138886-1 (0.044 mg/L). For most samples, concentrations in the samples were >10x the amount in the FB. BP-MW07-EM07 concentration was 0.43mg/L.	
6010B: Calcium and magnesium were detected in FIELDQC-EM07-EB in 440-138886-1. Magnesium was detected in MB 440-314121/1-A (0.0149 mg/L). Magnesium was detected in CCB 440-315289/13, CCB 440-315289/24, and CCB 440-315289/27. Concentrations in the samples were >10x the amount in the blanks. Copper was detected in CCB 440-315289/27, but not in the associated sample. No qualification.	
6020: Antimony was detected in CCB 440-315059/25. It was detected in one sample at a concentration >10x the amount in the blank. No qualification.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM07. The following recoveries were outside limits: nitrite (high), chloride (low), sulfate (low). Nitrite was not detected in the sample, so there can be no high bias. Chloride and sulfate concentrations in the sample were >4x the amount spiked, so recovery criteria do not apply. No qualification is needed.	

300.1B: MS/MSD ran on BP-MW07-EM07. Chlorite was not recovered in the MS/MSD.
6010B: MS/MSD ran on BP-MW07-EM07. The following recoveries were outside limits: calcium (high in MS), magnesium (low), and sodium (high). Concentrations in the sample were >4x the amount spiked, so recovery criteria do not apply. No qualification is needed.
6020: MS/MSD ran on BP-MW07-EM07. Arsenic recovery was high in the MSD. The concentration in the sample was >4x the amount spiked, so recovery criteria do not apply. No qualification is needed.
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.
VFA-IC: MS/MSD ran on BP-MW07-EM07 in batch 289145. Recoveries were high for propionic acid. The compound was not detected in the sample, so there can be no high bias. No qualification is needed. In analytical batch 288966, MS/MSD were not evaluated for accuracy and precision due to high concentrations in the batch QC source sample.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6020: Selenium was detected above the absolute value of the MDL. The concentrations of selenium and the interferents in the project samples are not comparable, so qualification is not required.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/No/Yes
Notes: Only 3 IS were added to the closing CCV and CCB of batch 315059. Four IS were added to the ICAL, samples, and opening CCVs and CCBs. Method 6020 doesn't specify the number of IS to use. Lab stated that the missing IS (Sc-45) is not used for the metals reported and the recoveries for Sc-45 failed in those 2 samples. No qualification.	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/ Yes/Yes

Validated by: Maureen McMyler 06/10/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 7
SDG/Report No.: 440-139184-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW03-EM07 and BP-MW08-EM07: Qualify total Phosphorous "J+". BP-MW01-EM07: Qualify total iron "J+"
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW03-EM07: Qualify acetic acid, formic-acid, lactic acid, n-butyric acid "UJ". BP-MW01-EM07: Qualify tungsten "R".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution		X	No	None
12. Internal Standards	X		No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified, unless rejected.
Usability: Results qualified "R" are not useable. Results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-01-EM07	440-139184-1	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
MW-K5-EM07	440-139184-2	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
BP-MW01-EM07	440-139184-3	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
BP-MW05-EM07	440-139184-4	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
BP-MW03-EM07	440-139184-5	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
BP-MW06-EM07	440-139184-6	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC
BP-MW08-EM07	440-139184-7	02/24/16	1.8 ºC, 2.4 ºC, 3.1 ºC, 3.5 ºC, 3.9 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
One cooler was received at 1.8 ºC.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Chloride was detected in CCB 440-313601/53. Concentrations in the samples were >10x the amount in the blank. No qualification.	
365.3: Phosphorous was detected in FIELDQC-EM07-FB in 440-138886-1 below the RL. Concentrations in BP-MW03-EM07 and BP-MW08-EM07 may be biased high.	
6010B: Calcium and magnesium were detected in FIELDQC-EM07-EB in 440-138886-1. Magnesium was detected in CCB of analytical batch 440-315515 above the RL. Calcium and boron were detected in CBs below the RL. Concentrations in the samples were >10x the amount in the blanks. No qualification. Iron was detected in CCB 440-315291/21 (3/3/16) at 0.0209 mg/L. Concentrations in all samples except BP-MW01-EM07 were >10x the amount in the blank.	
6020: Antimony was detected in CCB 440-315059/25, but not in the samples. No qualification.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on unrelated samples. Chloride MS recovery was below limits. Project data are not affected.	
365.3: MS/MSD (Batch 314861) ran on an unrelated sample. MS recovery of phosphorous was low. Project data are not affected.	

6010B: MS/MSD ran on BP-MW01-EM07. The following recoveries were outside limits in the MS and/or MSD: calcium, magnesium, silicon, sodium, strontium, and tungsten. Concentrations in the sample were >4x the amount spiked for all except tungsten, so recovery criteria do not apply. Tungsten was not detected in the MS/MSD.
6020: MS/MSD ran on a sample from another work order. Arsenic recovery was high in the MSD. The concentration in the sample was >4x the amount spiked, so recovery criteria do not apply. No qualification is needed.
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.
VFA-IC: MS/MSD ran on BP-MW03-EM07. Recoveries were low for acetic acid, formic-acid, lactic acid, n-butyric acid, and high for propionic acid. No VFAs were detected in the parent. MS/MSD ran on BP-MW08-EM07 for pyruvic acid. Recoveries were high, but it was not detected in the parent.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/Yes

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/No/Yes
Notes: Only 3 IS were added to the closing CCV and CCB of batch 315059. Four IS were added to the ICAL, samples, and opening CCVs and CCBs. Method 6020 doesn't specify the number of IS to use, however, CLP guidelines specify that 5 should be added.	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA

Validated by: Maureen McMyler 07/05/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation EM08
Project No.: 100-TEN-T35908B
No. of Samples: 3
SDG/Report No.: 440-142130-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (1); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW08-EM08: Qualify acetic acid and dissolved iron "J+" and dissolved aluminum "J". FieldQC-EM08-EB and FieldQC-EM08-FB: Qualify dissolved boron "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW08-EM08: Qualify butyric acid, formic acid, lactic acid "UJ".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
FieldQC-EM08-EB	440-142130-1	03/21/16	1.6 °C, 2.1 °C, 4.1 °C
FieldQC-EM08-FB	440-142130-2	03/21/16	1.6 °C, 2.1 °C, 4.1 °C
BP-MW08-EM08	440-142130-3	03/21/16	1.6 °C, 2.1 °C, 4.1 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
Note: Sample temperature at receipt was 1.6 ºC. Since the samples were not frozen, no qualification is needed.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300: Chloride was detected in FieldQC-EM08-EB. Chloride and nitrate were detected in FIELDQC-EM08-FB. The concentrations in the sample are greater than 10x the amount in the blanks. Project data are not affected.	
314: Perchlorate was detected in FieldQC-EM08-EB. The concentration in the sample is greater than 1000x the amount in the blank. Project data are not affected.	
6010B: Detections in blanks: FieldQC-EM08-FB: dissolved aluminum and boron; FieldQC-EM08-EB: dissolved aluminum, boron, calcium, iron, magnesium, silicon, sodium, strontium, and zinc. Boron was detected in the method blank of prep batch 440-320991, and in calibration blanks CCB 440-321359/15 and CCB 440-321359/27. In most cases, the concentrations in the sample are greater than 10x the amount in the blank. Aluminum was detected in BP-MW08-EM08 at similar concentration. Boron concentrations in the EB and FB are at similar concentrations as the prep blank. Dissolved iron detection in BP-MW08-EM08 may be biased high, but is estimated. Beryllium and titanium were detected in CCB 440-321359/27 from 3/30/16, but not in the associated samples.	
RSK-175: Methane was detected in FIELDQC-EM08-EB. The concentrations in the associated sample is greater than 10x the amount in the blank. Project data are not affected.	
VFA-IC: Acetic acid was detected in FieldQC-EM08-FB and the field sample. The concentration in the sample may be biased high and will be qualified "J"	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on an unrelated sample. Several recoveries were outside limits. Project data are not affected.	
365.3: MS/MSD ran on an unrelated sample. Phosphorous recoveries were below limits. Project data are not affected.	
6010B: MS/MSD ran on an unrelated sample. Several recoveries were outside acceptable limits: calcium, magnesium, manganese, sodium, strontium. Project data are not affected.	
7199, SM5220: MS/MSD ran on equipment rinsate FieldQC-EM08-EB.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on BP-MW08-EM08 and an unrelated sample. In BP-MW08-EM08 recoveries were outside limits for butyric acid, formic acid, lactic acid (MS), and propionic acid. Lactic acid RPD was high. Propionic acid recoveries were high. Since it was not detected in the sample, there can be no high bias.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standards, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. The interferents' concentrations in the sample were not high enough to affect the samples. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Serial dilution ran for 6020 only on an unrelated sample.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA

Validated by: Maureen McMyler 06/07/16 (revised 04/26/17)

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-142292-1/2
Project No.:	100-TEN-T35908	Lab ID:	Test America - Irvine
No. of Samples:	7	Matrix:	Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	MW-K5-EM08: Qualify TOC "J-"
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW01-EM08, BP-MW09-EM08: Qualify dissolved iron "J". BP-MW02-EM08, BP-MW02-EM08-FD: Qualify dissolved iron "J+". BP-MW02-EM08, BP-MW05-EM08: Qualify dissolved zinc "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW01-EM08: Qualify nitrate "J-" BP-MW09-EM08: Qualify boron and potassium "J+".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	BP-MW09-EM08: Qualify Tungsten "UJ". All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-01-EM08	440-142292-1	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
MW-K5-EM08	440-142292-2	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
BP-MW09-EM08	440-142292-3	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
BP-MW01-EM08	440-142292-4	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
BP-MW05-EM08	440-142292-5	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
BP-MW02-EM08	440-142292-6	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC
BP-MW02-EM08-FD	440-142292-7	03/22/16	2.1 ºC, 2.5 ºC, 3.8 ºC, 4.4 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
SM5310B: MW-K5-EM08 was not preserved to pH <2 in the field. The pH was adjusted by the lab before analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300: In data package 440-142130-1, chloride was detected in FieldQC-EM08-EB and FieldQC-EM08-FB. Nitrate was detected in FIELDQC-EM08-FB. The concentrations in the samples are greater than 1000x the amount in the blanks. Project data are not affected.	
314: In data package 440-142130-1, perchlorate was detected in FieldQC-EM08-EB. The concentrations in the samples are greater than 1000x the amount in the blanks. Project data are not affected.	
6010B: Detections in blanks: FieldQC-EM08-FB: dissolved aluminum and boron; FieldQC-EM08-EB: dissolved aluminum, boron, calcium, iron, magnesium, silicon, sodium, strontium, and zinc. Boron was detected in the method blank of prep batch 440-320991, and in calibration blanks CCB 440-321359/15 and CCB 440-321359/27. Aluminum was not detected in any field samples. In most cases, the concentrations in the samples are greater than 10x the amount in the blank. Iron and zinc detections <RL may be biased high, but are estimated. Beryllium and titanium were detected in CCB 440-321359/27 from 3/30/16, but not in the associated samples. Silver was detected in ICB 440-324859/6 on 4/17/16, but not in the associated sample. Calcium was detected in CCB 440-324859/23 on 4/17/16. Concentration in the associated sample was > 10x the amount in the blank.	
RSK-175: Methane was detected in FIELDQC-EM08-EB. The concentrations in the samples are greater than 10x the amount in the blank. Project data are not affected.	
VFA-IC: Acetic acid was detected in FieldQC-EM08-EB and one field sample. The concentration in the sample was >10x the amount in the blank. Project data are not affected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW01-EM08. Nitrate recoveries were low. Concentrations of chloride and sulfate in the parent sample were much higher than the amount spiked. The lab did not evaluate accuracy and precision.	
6010B: MS/MSD ran on BP-MW09-EM08 and an unrelated sample. In BP-MW09-EM08 the following recoveries were outside acceptable limits: boron, calcium, magnesium, potassium (MSD), silicon (MSD), sodium, strontium. For all but boron and potassium, the concentrations in the parent sample were >4x the amount spiked. Dissolved boron and potassium results in BP-MW09-EM08 should be considered estimated, biased high. Potassium MS recovery and RPD were within limits.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on an unrelated sample from another work order. Recoveries were outside limits for several fatty acids. Project data are not affected. No qualification is needed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: ICSA for batch 440-324859 associated with sample BP-MW09-EM08 was detected above the MDL. Since lead was not detected in the sample, there is no false positive. No qualification is needed.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/No
6010B: Tungsten recovery was low (29%) in CRI 440-326122/11. Accepted range is 50%-150%. Sample BP-MW09-EM08 was associated with this batch and will be qualified "UJ".	
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes
Field duplicate pair was BP-MW02-EM08 and BP-MW02-EM08-FD.	

Validated by: Maureen McMyler 06/06/16 (revised 05/05/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908B
No. of Samples: 7
SDG/Report No.: 440-142440-1/2
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (5); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-MW07-EM08: Qualify methane and TOC “J-”.
2. Chain-of-Custody		X	No	None
3. Holding Times	X		No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)	X		Yes	BP-MW03-EM08: Qualify perchlorate "J+". BP-MW04-EM08: Qualify Fe(D) "J", Fe(T) “J+”, and methane “J+”. BP-MW06-EM08: Qualify Fe(T) “J+”. BP-MW07-EM08: Qualify Fe(D) "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM08: Qualify chlorite “R”; formic-acid, lactic acid, n-butyric acid "UJ"; qualify As(D) and Se(D) "J-“; qualify P(T) and Sb(D) "J". BP-MW04-EM08: Qualify lactic acid "UJ". PC-98-EM08: Qualify nitrate "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	BP-MW07-EM08, BP-MW03-EM08, BP-MW06-EM08, BP-MW04-EM08: Qualify Tungsten "UJ". All: Qualify detections between the MDL and RL “J”.
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified “R” are not useable. Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
PC-98-EM08	440-142440-1	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW07-EM08	440-142440-2	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW07-EM08-MS	440-142440-2MS	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW07-EM08-MSD	440-142440-2MSD	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW03-EM08	440-142440-3	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW06-EM08	440-142440-4	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC
BP-MW04-EM08	440-142440-5	03/23/16	2.2 ºC, 3.8 ºC, 4.1 ºC, 4.2 ºC, 4.4 ºC, 4.5 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
RSK-175: BP-MW07-EM08 pH was 5.	
SM5310B: BP-MW07-EM08 was received at the lab with pH >2. The lab adjusted the pH before analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
7199: MS/MSD of BP-MW07-EM08 was analyzed outside of holding time. Regular field samples not affected.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: FieldQC-EM08-EB and FieldQC-EM08-FB are found in SDG 440-142130-1.	
300: Chloride was detected in FieldQC-EM08-EB and FieldQC-EM08-FB. Nitrate was detected in FIELDQC-EM08-FB. The concentrations in the sample are greater than 10x the amount in the blanks or not detected. Project data are not affected.	
314: Perchlorate was detected in FieldQC-EM08-EB. The concentration in BP-MW03-EM08 should be considered estimated, biased high. Other project data are not affected.	
6010B: Iron was detected in MB 440-321134/1-A. Dissolved metals detected in FieldQC-EM08-EB include: aluminum, boron, calcium, iron, magnesium, silicon, sodium, strontium, and zinc. Aluminum and boron were was detected in FieldQC-EM08-FB. In most cases, the concentrations in the samples were greater than 10x the amount in the blank or were not detected. Dissolved iron detections in BP-MW04-EM08 and BP-MW07-EM08 should be considered estimated and estimated, biased high, respectively. Total iron detections in BP-MW04-EM08 and BP-MW06-EM08 should be considered estimated, biased high. Silver was detected in ICB 440-321939/6 but not in the samples. Silicon was detected in CCB 440-321939/13. The concentrations in the samples are > 10x the amount in the blank. No qualification is needed for either metal.	
RSK-175: Methane was detected in FIELDQC-EM08-EB. The concentration BP-MW04-EM08 should be considered estimated, biased high. Other project data are not affected.	
VFA-IC: Acetic acid was detected in FieldQC-EM08-EB. The concentrations in the samples are greater than 10x the amount in the blanks or not detected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: In the MS/MSD of PC-98-EM08 nitrate MS recovery was low (77%) and nitrite MSD recovery was high (143%). Nitrite was not detected in the parent sample, there can be no high bias. Nitrate MSD recovery and RPD were within limits. In the MS/MSD of BP-MW07-EM08, nitrite recoveries were high (144 and 143%) and chloride recoveries were low (-89% and -43%). Nitrite was not detected in the parent sample; there can be no high bias. Chloride concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1: MS/MSD ran on BP-MW07-EM08. Chlorite recoveries were low (0%).	
314: MS/MSD ran on an unrelated sample. Perchlorate recoveries were outside acceptable limits. Concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply. Project data are not affected.	
365.3: MS/MSD ran on BP-MW07-EM08. Phosphorous recoveries were low at 17% and 19%. Phosphorous should be considered estimated, biased low in BP-MW07-EM08.	
6010B: MS/MSD ran on BP-MW07-EM08. The following recoveries were outside acceptable limits: calcium (153% and 160%), silicon (MS: 72%), and sodium (-264% and 165%). Concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
6020: MS/MSD ran on BP-MW07-EM08. The following recoveries were outside acceptable limits: antimony (63% and 67%), arsenic (MS only 64%), and selenium (-10% and -12%). Antimony and selenium should be considered estimated, biased low in BP-MW07-EM08.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on BP-MW04-EM08 and BP-MW07-EM08. In BP-MW07-EM08 recoveries were outside limits for butyric acid (47% and 47%), formic acid (71% and 79%), lactic acid (52% and 56%), propionic acid (4304% and 4360%), and pyruvic acid (134% and 137%). Since propionic and pyruvic acids were not detected in the sample, there can be no high bias. The other VFAs should be considered estimated, biased low in BP-MW07-EM08. MS only was ran on BP-MW04-EM08. Recovery was low for lactic acid (78%). It should be considered estimated, biased low in the parent.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: The interference check standard ICSA 440-321939/7 was detected above the reporting limit for lead. Lead was not detected in the associated samples. Project data are not affected.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	
6010B: Tungsten recovery was low (45%) in CRI 440-321916/11. Accepted range is 50%-150%. Non-detects will be qualified "UJ".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA

Validated by: Maureen McMyler 07/13/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908B
No. of Samples: 6
SDG/Report No.: 440-144883-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	BP-MW02-EM09-FD: Qualify CrVI "J-".
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW02-EM09, BP-MW02-EM09-FD: Qualify Cr(D), Fe(D), and Fe(T) "J"; PC-98R-EM09: Qualify Cr(D) and P(D) "J+", and Fe(D) "J"; BP-MW04-EM09: Qualify Cr(D) and Fe(D) "J+"; BP-MW06-EM09: Qualify Fe(D) "J+"; BP-MW08-EM09: Qualify Cr(D) "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	BP-MW08-EM09: Qualify B(D) "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates	X		Yes	BP-MW02-EM09 and BP-MW02-EM09-FD: Qualify total iron "J".

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW08-EM09	440-144883-1	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC
BP-MW04-EM09	440-144883-2	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC
BP-MW02-EM09	440-144883-3	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC
BP-MW02-EM09-FD	440-144883-4	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC
BP-MW06-EM09	440-144883-5	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC
PC-98R-EM09	440-144883-6	04/19/16	1.7 ºC, 3.3 ºC, 3.6 ºC, 3.7 ºC, 3.7 ºC, 4.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
One cooler was received at 1.7 ºC. No qualification.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
7199: BP-MW02-EM09-FD was analyzed outside of holding time (24.17 hours).	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: Equipment blank FieldQC-EM09-EB and field blank FieldQC-EM09-FB are in SDG 440-145019-1.	
300: Chloride was detected in FieldQC-EM09-EB and FieldQC-EM09-FB. Nitrate was detected in FIELDQC-EM09-FB. Sulfate was detected in FieldQC-EM09-EB. The concentrations in the samples are greater than 10x the amount in the blanks. Project data are not affected.	
6010B: Metals were detected in several blanks. Metals detected in FieldQC-EM09-EB include: dissolved calcium, iron, magnesium, and silicon and total iron. Metals detected in FieldQC-EM09-FB were dissolved boron, chromium, iron, and nickel. Several metals were detected in calibration blanks above the MDL. CCB 440-327048/13: iron and titanium; CCB 440-327048/25: calcium; CCB 440-327048/37: calcium and phosphorus; ICB 440-327674/6: silver; CCB 440-327674/13: magnesium; CCB 440-327674/21: magnesium and sodium; CCB 440-328179/25: sodium. Most concentrations in the field samples were either >10x the amount in the blank or not detected. Some chromium, iron, and phosphorous results will be qualified.	
RSK-175: Methane was detected in FIELDQC-EM09-EB. The concentration in the associated sample is greater than 10x the amount in the blank. Project data are not affected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No

300.0: MS/MSD ran on BP-MW02-EM09-FD and an unrelated sample. Due to high concentrations of chloride and sulfate in BP-MW02-EM09-FD recoveries were not applicable nor were they evaluated by the lab.
6010B: MS/MSD ran on BP-MW08-EM09. The following recoveries were outside acceptable limits: Boron (71% in MS), calcium (-360% in MS), magnesium (-93% and 3%), silicon (31% and 52%), and sodium (-184% in MS). Concentrations in the parent sample were >4x the amount spiked for all but boron, so recovery criteria do not apply. Boron MSD recovery and RPD were within limits.
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.
VFA-IC: MS/MSD ran on a sample from another work order. Recoveries were outside limits for most VFAs. No qualification in this work order.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: The interference check standard for batch 321939 was above the upper acceptance limit for lead. Lead was not detected in the associated samples. Metals were detected in interference check standards, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	
6020: Selenium was detected in interference check standard ICSA 440-326891/12 at a negative concentration. The absolute value of the concentration was above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/NA
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/No
The difference was > RL for total iron. Total iron should be considered estimated in BP-MW02-EM09 and BP-MW02-EM09-FD.	

Validated by: Maureen McMyler 07/06/16 (Revised 05/02/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908B
No. of Samples: 11
SDG/Report No.: 440-145019-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (7); Water QC (4)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	BP-MW07-EM09: Qualify TOC "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks (Method and/or Field QC)	X		Yes	BH-01-EM09: Qualify P(D) "J+"; BP-MW01-EM09: Qualify Cr(D), Fe(D), and P(D) "J+"; BP-MW03-EM09: Qualify Fe(D) and P(D) "J+", Ni(D) "J"; BP-MW05-EM09: Qualify Cr(D) "J+"; BP-MW09-EM09: Qualify Cr(D) "J+"; Fe(D), Fe (T), and P(D) "J"; MW-K5-EM09: Qualify Cr(D) "J" and P(D) "J+".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM09: Qualify Se(D) and total P "J"; qualify acetic acid and n-butyric acid "UJ"; qualify TKN and Mn(T) "J-".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution	X		Yes	BP-MW05-EM09: Qualify As(D) "J".
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-01-EM09	440-145019-1	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
MW-K5-EM09	440-145019-2	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW01-EM09	440-145019-3	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW03-EM09	440-145019-4	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW05-EM09	440-145019-5	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW07-EM09	440-145019-6	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW07-EM09-MS	440-145019-6MS	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW07-EM09-MSD	440-145019-6MSD	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
BP-MW09-EM09	440-145019-7	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
FIELDQC-EM09-EB	440-145019-8	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC
FIELDQC-EM09-FB	440-145019-9	04/20/16	1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC, 2.4 ºC, 2.5 ºC, 4.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/No/Yes
Coolers were received at 1.1 ºC, 1.5 ºC, 1.7 ºC, 1.9 ºC. No qualification.	
SM5310B: BP-MW07-EM09 was received with pH >2. The pH of the sample was adjusted to pH<2 in the laboratory prior to analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/No
300.1: The %D for the surrogate compound was outside limits in CCV 440-327662/56 on 5/3/2016. Project data are not affected.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300: Chloride and sulfate were detected in FieldQC-EM09-EB. Chloride and nitrate were detected in FIELDQC-EM09-FB. The concentrations in the samples are greater than 10x the amount in the blanks. Project data are not affected.	
6010B: Metals were detected in several blanks. Metals detected in FieldQC-EM09-EB include: dissolved calcium, iron, magnesium, and silicon and total iron. Metals detected in FieldQC-EM09-FB were dissolved boron, chromium, iron, and nickel. Several metals were detected in calibration blanks above the MDL. CCB 440-327048/25: calcium; CCB 440-327048/37 and CCB 440-327048/42: calcium and phosphorus; CCB 440-327266/23: calcium and magnesium; CCB 440-328179/25 and CCB 440-328179/37: sodium. Most concentrations in the field samples were either >10x the amount in the blank or not detected. Some chromium, iron, nickel, and phosphorous results will be qualified.	
RSK-175: Methane was detected in FIELDQC-EM09-EB. The concentrations in the associated samples are greater than 10x the amount in the blank or it was not detected. Project data are not affected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM09. Chloride and sulfate recoveries were outside limits. Concentrations in the parent sample were >4x the amount spiked. Nitrite recoveries were high, but it was not detected in the parent sample so there can be no high bias. No qualification.	
351.2: MS/MSD ran on BP-MW07-EM09. MSD recovery of Total Kjeldahl Nitrogen was low. MS recovery and RPD were within limits.	
365.3: MS/MSD ran on BP-MW07-EM09. Total Phosphorous recoveries were low. Total Phosphorous should be considered estimated, biased low in BP-MW07-EM09.	
6010B: MS/MSD ran on BP-MW07-EM09 and a sample from another work order. The following recoveries were outside acceptable limits in BP-MW07-EM09: calcium, magnesium, total manganese (MSD), silicon, sodium, and strontium (MSD). Concentrations in the parent sample were >4x the amount spiked for all but total manganese, so recovery criteria do not apply. Manganese MS recovery and RPD were within limits.	
6020: MS/MSD ran on BP-MW07-EM09. Selenium recoveries were low. Selenium should be considered estimated, biased low in BP-MW07-EM09.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
VFA-IC: MS/MSD ran on BP-MW07-EM09. The following recoveries were outside limits: acetic acid (low), lactic acid (high), n-butyric acid (low), propionic acid (high). All were ND in the parent sample. Acetic acid and n-butyric acid will be qualified.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Phosphorous was detected in interference check standard ICSA 440-328819/7 above the MDL. It was not detected in the associated sample. Project data are not affected.	
6020: Selenium was detected in interference check standard ICSA 440-326891/12 at a negative concentration. The absolute value of the concentration was greater than the MDL. Since interferents were not at sufficient levels in the sample, no qualification is necessary. Project data are not affected.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/No
6020: Serial dilution %D was high for arsenic in BP-MW05-EM09.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
Results detected between the method detection limit and reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA

Validated by: Maureen McMyler 07/13/16 (revised 05/02/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 3
SDG/Report No.: 440-147424-1
Lab ID: Test America - Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-IW01-EM09B, BP-IW02-EM09B, BP-IW03-EM09B: Qualify TOC "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Method and/or Field QC)		X	No	None
7. Surrogates/Monitoring Compounds	---	---	---	---
8. Matrix Spike/Matrix Spike Duplicate		X	No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples		X	No	None
11. Serial Dilution	---	---	---	---
12. Internal Standards	---	---	---	---
13. Compound Quantitation and Reporting Limits		X	No	None
14. Duplicates	X		No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-IW01-EM09B	440-147424-1	05/12/16	1.8 ºC
BP-IW02-EM09B	440-147424-2	05/12/16	1.8 ºC
BP-IW03-EM09B	440-147424-3	05/12/16	1.8 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4°C (+ or – 2°C)? Were samples received in proper condition?	No/No/Yes
Note: Cooler temperature at receipt was 1.8 °C	
SM5310B: Samples were not preserved to pH < 2. The lab adjusted the pH to <2 before analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	N/A
Note: Analyzed methods do not require surrogates	

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/Yes
ALL: MS/MSD ran on unrelated samples.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/N/A

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	N/A
Note: Analyzed methods do not require serial dilutions	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	N/A
Note: Analyzed methods do not require IS.	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA
314.0: Lab duplicate ran on an unrelated sample. RPD was high. Project data are not affected.	

Validated by: Maureen McMyler 07/14/16 (revised 02/07/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908B
No. of Samples: 3
SDG/Report No.: 440-147621-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (1); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks (Lab and/or Field)	X		No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Tune		X	No	None
13. Internal Standards		X	No	None
14. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
15. Duplicates		X	No	None

Verification and Validation Label	Stage_4_Validation_Manual for sample
Verification and Validation Label Code	S4VM

Overall Assessment: Acceptable as qualified.
Detections in Field QC EM10-EB may affect data in other work orders.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
Field QC EM10-EB	440-147621-1	05/16/16	2.0 °C, 3.9 °C, 3.9 °C
Field QC-EM10-FB	440-147621-2	05/16/16	2.0 °C, 3.9 °C, 3.9 °C
BP-MW04-EM10	440-147621-3	05/16/16	2.0 °C, 3.9 °C, 3.9 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in MB 440-332163/1-A. Dissolved metals detected in FIELDQC-EM10-EB include: calcium, silicon, and sodium. The concentrations in BP-MW04-EM10 were greater than 10x the amount in the blanks.	
RSK-175: Methane was detected in FIELDQC-EM10-EB. The concentration in BP-MW04-EM10 is greater than 10x the amount in the EB.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/No/No
300.0: MS/MSD ran on an unrelated sample. Nitrite recoveries were high. Chloride and sulfate recoveries were not reported. Project data are not affected.	
365.3: MS/MSD ran on an unrelated sample. Phosphorous recoveries were low. Project data are not affected.	
6010B: MS/MSD ran on an unrelated sample. Calcium and magnesium (MS only) recoveries were low. Concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply. Some recalculated recoveries do not match the reported values. Project data not affected.	
6020: MS/MSD ran on Field QC EMI0-EB, not a field sample. Recoveries and RPDs were acceptable.	
7199: The lab analyzed MS/MSD on Field QC EMI0-FB, not a field sample. Recoveries and RPDs were acceptable.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
SM5310B: MS/MSD ran on an unrelated sample. TOC recalculated recoveries do not match the reported values, although they are within limits. Project data are not affected.	
VFA-IC: MS/MSD ran on an unrelated sample. Recoveries were outside limits for lactic acid and propionic acid. Project data are not affected.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/No
6010: Eleven metals were detected in interference check standard ICSA 440-331963/10, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	
6020: Selenium was detected in interference check standard ICSA 440-332619/10 at a negative concentration. The absolute value of the concentration was above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution (SD)	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/Yes/NA
Notes: Serial dilution ran for 6020 only. Field QC-EM10-FB was used for SD. No detections.	

12. Tune (Method 6020)	
Did the lab analyze or scan an ICP-MS tuning solution? Were 5 consecutive scans performed? Do the resolutions of the mass calibrations fall within the limits for each isotope? Is the %RSD of the absolute signals < 5%?	Yes/Yes/Yes/Yes
Notes:	

13. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

14. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

15. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Lab duplicates only.	

Validated by: Maureen McMyler 08/04/16 (revised 05/03/17)

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-147753-1/2
Project No.:	100-TEN-T35908B	Lab ID:	Test America – Irvine/Buffalo
No. of Samples:	7	Matrix:	Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		Yes	BP-MW02-EM10, BP-MW02-EM10-FD, and BP-MW08-EM10: Qualify acetic acid "UJ".
6. Blanks	X		Yes	BP-MW02-EM10: Qualify Fe (T) "J" BP-MW08-EM10: Qualify Fe (T) "J+"
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Tune		X	No	None
13. Internal Standards		X	No	None
14. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
15. Duplicates	X		Yes	BP-MW02-EM10 and BP-MW02-EM10-FD: Qualify total iron "J".

Verification and Validation Label	Stage_4_Validation_Manual
Verification and Validation Label Code	S4VM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
MW-K5-EM10	440-147753-1	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
BH-01-EM10	440-147753-2	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
PC-98R-EM10	440-147753-3	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
BP-MW02-EM10	440-147753-4	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
BP-MW02-EM10-FD	440-147753-5	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
BP-MW08-EM10	440-147753-6	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C
BP-MW06-EM10	440-147753-7	05/17/16	3.1 °C, 3.2 °C, 3.3 °C, 3.4 °C, 4.8 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/No
6010B/6020: PC-98R-EM10 metals' analyses were not requested on the COC. The lab received the sample bottles, but did not note the discrepancy. The sample was reported separately.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/No
VFA: CCV recovery for acetic acid was 273%. Acceptable recovery range is 80-120%. Acetic acid was not detected in the samples.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in MB 440-332163/1-A. The concentrations in all samples except BP-MW02-EM10 and BP-MW08-EM10 were greater than 10x the amount in the blank. Dissolved metals detected in FIELDQC-EM10-EB include: calcium, silicon, and sodium. Magnesium and calcium were detected in CCB 440-346159/21 associated with PC-98R-EM10. The concentrations in the samples were greater than 10x the amount in the blanks.	
RSK-175: Methane was detected in FIELDQC-EM10-EB. The concentrations in the field samples are greater than 10x the amount in the EB. Project data are not affected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/No/No
300.0: MS/MSD ran on BP-MW06-EM10. Chloride and sulfate recoveries were not reported. Project data are not affected.	
300.1: MS/MSD ran on an unrelated sample. Chlorate recalculated recoveries do not match the reported values, although they are within limits. Project data are not affected.	
6010B: MS/MSD ran on an unrelated sample and on PC-98R-EM10. For PC-98R-EM10, calcium and magnesium recoveries were outside acceptable limits. Concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply. Project data not affected.	
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.	
SM5310B: MS/MSD ran on an unrelated sample. TOC recalculated recoveries do not match the reported values, although they are within limits. Project data are not affected.	
VFA-IC: MS/MSD ran on a sample from another work order in two batches. Recoveries were outside limits for several compounds. No samples in this work order are affected.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value?	Yes/No
6010: Several metals were detected in interference check standards ICSA 440-332339/7 and ICSA 440-346159/7, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. Boron was detected in ICSA 440-346175/7 above the MDL. The interferents' concentrations in the samples were not high enough to affect the samples. No qualification is needed.	
6020: Selenium was detected in interference check standard ICSA 440-332619/10 and ICSA 440-346177/10 at negative concentrations. The absolute value of the concentrations were above the method detection limit. The interferents' concentrations in the sample were not high enough to affect the samples. No qualification is needed.	

11. Serial Dilution (SD)	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/Yes/Yes
Notes: Serial dilution ran for 6020 only on PC-98R-EM10 and an unrelated sample.	

12. Tune (Method 6020)	
Did the lab analyze or scan an ICP-MS tuning solution? Were 5 consecutive scans performed? Do the resolutions of the mass calibrations fall within the limits for each isotope? Is the %RSD of the absolute signals < 5%?	Yes/Yes/Yes/Yes
Notes:	

13. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

14. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

15. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/Yes
For BP-MW02-EM10 and BP-MW02-EM10-FD, three analytes were detected in one sample, but not the other. Bromide was detected above the RL in BP-MW02-EM10. Dissolved chromium and iron were detected in BP-MW02-EM10-FD above the MDL.	

Validated by: Maureen McMyler 08/17/16 (Revised 02/07/17)

Data Verification and Validation Summary

Project Name:	NERT Bioremediation	SDG/Report No.:	440-147905-1
Project No.:	100-TEN-T35908	Lab ID:	Test America – Irvine/Buffalo
No. of Samples:	7	Matrix:	Water (5); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification	X		No	None
6. Blanks	X		Yes	BP-MW01-EM10, BP-MW05-EM10: Qualify Fe(T) "J+"; BP-MW09-EM10: Qualify Fe(T) "J". BP-MW03-EM10, BP-MW05-EM10: Qualify antimony "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM10: Qualify selenium "J"; qualify acetic acid, formic acid, and n-butyric acid "UJ".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Tune		X	No	None
13. Internal Standards		X	No	None
14. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
15. Duplicates		X	No	None

Verification and Validation Label	Stage_4_Validation_Manual
Verification and Validation Label Code	S4VM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW03-EM10	440-147905-1	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW07-EM10	440-147905-2	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW07-EM10-MS	440-147905-2MS	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW07-EM10-MSD	440-147905-2MSD	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW09-EM10	440-147905-3	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW05-EM10	440-147905-4	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C
BP-MW01-EM10	440-147905-5	05/18/16	1.9 °C, 2.0 °C, 2.7 °C, 5.7 °C, 4.8 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
One cooler received at 1.9 ºC. Project data are not affected.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/No
6010B: Silicon CCV recovery was above acceptable limits in batch 440-332871. The CCV was not associated with field samples. Project data are not affected.	
VFA: CCV recovery for acetic acid was 273%. Acceptable recovery range is 80-120%. Acetic acid was not detected in the samples. Per inorganic NFG, no qualification will be applied.	

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Iron was detected in MB 440-332163/1-A. The total iron concentrations in three samples were < than 10x the amount in the blank. They will be qualified. Dissolved metals detected in FIELDQC-EM10-EB include: calcium, silicon, and sodium. The concentrations in the sample were greater than 10x the amount in the blanks.	
6020: Antimony and arsenic were detected in ICB 440-333657/8. Arsenic was detected in CCB 440-333657/14. The arsenic concentrations in the samples were greater than 10x the amount in the blanks. Antimony will be qualified in samples were it was detected.	
RSK-175: Methane was detected in FIELDQC-EM10-EB. The concentrations in the field samples are greater than 10x the amount in the EB. Project data are not affected.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/No/No
300.0: MS/MSD ran on BP-MW07-EM10. Nitrite recoveries were high. Chloride and sulfate recoveries were low. Nitrite was not detected in the parent, so there can be no high bias. Chloride and sulfate concentrations in the parent were >4x the amount spiked so recovery criteria do not apply.	
6010B: MS/MSD ran on BP-MW07-EM10. Calcium (MSD only), magnesium (MSD only), and sodium recoveries were high. Concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

6020: MS/MSD ran on BP-MW07-EM10. Selenium MSD recovery was low. The RPD was high.
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.
VFA-IC: MS/MSD ran on BP-MW07-EM10. Recoveries were outside limits for acetic acid (low), formic acid (low-MS only), n-butyric acid (low), propionic acid (high) and pyruvic acid (high-MSD only). The VFAs were not detected in the parent sample, so there can be no high bias for high recoveries.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standards ICSA 440-333388/7 and ICSA 440-332871/9, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	
6020: Selenium was detected in interference check standard ICSA 440-333657/11 at a negative concentration. The absolute value of the concentration was above the method detection limit. Several of the interferents' concentrations in the samples were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution (SD)	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/Yes/NA
Notes: Serial dilution ran for 6020 only. Sample concentrations were <50X the MDL.	

12. Tune (Method 6020)	
Did the lab analyze or scan an ICP-MS tuning solution? Were 5 consecutive scans performed? Do the resolutions of the mass calibrations fall within the limits for each isotope? Is the %RSD of the absolute signals < 5%?	Yes/Yes/Yes/Yes
Notes:	

13. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

14. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

15. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/NA

Validated by: Maureen McMyler 08/09/16 (revised 05/04/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 2
SDG/Report No.: 440-154949-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	FIELDQC-EM11-EB: Qualify Ca(D) and Na(D) "J+"; qualify Mg(D) and Si(D) "J". FIELDQC-EM11-FB: Qualify Fe(D) and Si(D) "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
FIELDQC-EM11-FB	440-154949-1	08/08/16	2.8 °C, 3.7 °C
FIELDQC-EM11-EB	440-154949-2	08/08/16	2.8 °C, 3.7 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: Detections in equipment blank FieldQC-EM11-EB and field blank FieldQC-EM11-FB may affect sample results in other data packages.	
6010B: The following metals were detected in MB 440-348826/1-A: boron, calcium, iron, magnesium, silicon, and sodium. Several metals were detected in calibration blanks above the MDL: CCB 440-349892/20: boron, magnesium; CCB 440-349892/32: boron, sodium; CCB 440-349892/39: boron. Dissolved metals detected in FIELDQC-EM11-EB include calcium, magnesium, silicon, sodium, and zinc. Metals detected in FIELDQC-EM11-FB include dissolved aluminum, iron, and silicon. The presence of most of the metals in the FB and EB may be attributed to lab contamination, as they were detected in the lab blanks also.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0/6010B/SM 5220D/ VFA: MS/MSD ran on unrelated samples. Several recoveries were outside limits. Project data are not affected.	
RSK-175: MS/MSD not analyzed.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standards, several at negative concentrations. The absolute value of the concentrations were above the method detection limits. The interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Serial dilution ran for 6020 only on unrelated sample.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Lab duplicates only	

Validated by: Maureen McMyler 05/04/17

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 8
SDG/Report No.: 440-155093-1
Lab ID: Test America – Irvine/Buffalo
Matrix: Water (6); Water QC (2)

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	BP-MW02-EM11, BP-MW02-EM11-FD, BP-MW09-EM11: Qualify nitrate "J-" and nitrite "UJ".
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW02-EM11: Qualify total iron "J+". BP-MW08-EM11, BP-MW02-EM11-FD: Qualify total iron "J". BP-MW09-EM11, BP-MW02-EM11-FD: Qualify Methane "J".
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW07-EM11: Qualify Fe(T) and K(D) "J+"; qualify phosphorous (T) "J"; qualify acetic acid, formic-acid, lactic acid, n-butyric acid, nitrate "UJ"; qualify COD "J-"; qualify perchlorate "J".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates	X		Yes	BP-MW02-EM11, BP-MW02-EM11-FD: Qualify Methane "J"

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BP-MW09-EM11	440-155093-1	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW07-EM11	440-155093-2	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW07-EM11-MS	440-155093-2MS	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW07-EM11-MSD	440-155093-2MSD	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW02-EM11	440-155093-3	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW02-EM11-FD	440-155093-4	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW04-EM11	440-155093-5	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C
BP-MW08-EM11	440-155093-6	08/09/16	2.0 °C, 2.0 °C, 2.1 °C, 3.2 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
300.0: BP-MW02-EM11, BP-MW02-EM11-FD, BP-MW09-EM11 were analyzed outside of holding time.	

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: Equipment blank FieldQC-EM11-EB and field blank FieldQC-EM11-FB are in SDG 440-155949-1.	
300: Chloride was detected in calibration blank CCB 440-348109/33 on 8/11/16. The concentrations in the samples are greater than 10x the amount in the blank. Project data are not affected.	
6010B: Metals were detected in several blanks. Several metals were detected in calibration blanks above the MDL. ICB 440-350269/6 and CCB 440-350269/15: aluminum and lead; CCB 440-350269/27 and CCB 440-350269/30: aluminum and strontium; CCB 440-350269/41: aluminum. The concentrations in the field samples were either >10x the amount in the blank or not detected. Aluminum was detected in MB 440-349915/1-A. Dissolved metals detected in FIELDQC-EM11-EB include calcium, magnesium, silicon, sodium, and zinc. Metals detected in FIELDQC-EM11-FB include dissolved aluminum, iron, and silicon and total iron. In most cases, sample results were either ND or greater than 10x the amount in the blank.	
RSK-175: Methane was detected in FIELDQC-EM11-EB. The concentrations in most of the associated samples is greater than 10x the amount in the blank.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
300.0: MS/MSD ran on BP-MW07-EM11 and BP-MW02-EM11-FD. In BP-MW07-EM11, recoveries were low for chloride, nitrate, and sulfate and high for nitrite. Concentrations in the parent sample were >4x the amount spiked for chloride and sulfate, so recovery criteria do not apply. Nitrite was not detected in the parent sample, so there can be no high bias.	

314.0: MS/MSD ran on BP-MW07-EM11. Perchlorate recovery was high in MSD only.
365.3: MS/MSD ran on BP-MW07-EM11. Phosphorus RPD was high and MSD recovery was low. MS recovery was within limits.
6010B: MS/MSD ran on BP-MW07-EM11. The following recoveries were outside acceptable limits for dissolved metals: calcium, magnesium MSD, potassium MSD, silicon, sodium, and strontium MSD. Concentrations in the parent sample were >4x the amount spiked for all but potassium, so recovery criteria do not apply. Potassium MS recovery and RPD were within limits. Recoveries were high for total iron. Total iron and dissolved potassium will be qualified.
RSK-175: MS/MSD was not analyzed. The lab analyzed a LCSD.
VFA-IC: MS/MSD ran on BP-MW07-EM11. Recoveries were outside limits for all VFAs. The parent sample was ND for all VFAs. Propionic acid and pyruvic acid recoveries were high. They were not qualified because there can be no high bias for ND.

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standards ICSA 440-350323/8 and ICSA 440-350269/8, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. The interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	
6020: Metals were detected in interference check standard ICSA 440-350278/14 above the method detection limit. Several of the interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/Yes
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/Yes
FD RPD was high for methane in BP-MW02-EM11 and BP-MW02-EM11-FD.	

Validated by: Maureen McMyler 08/29/16 (Revised 05/02/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 5
SDG/Report No.: 440-155280-1
Lab ID: Test America – Irvine/Buffalo/Phoenix
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks	X		Yes	BP-MW01-EM11, BP-MW03-EM11: Qualify Zn(D) "J" BP-MW03-EM11: Qualify Fe(T) "J+"
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		Yes	BP-MW01-EM11: Qualify formic acid, lactic acid, n-butyric acid "UJ".
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
BP-MW06-EM11	440-155280-1	08/10/16	Range from 0.4 ºC to 4.3 ºC
BP-MW03-EM11	440-155280-2	08/10/16	Range from 0.4 ºC to 4.3 ºC
BP-MW05-EM11	440-155280-3	08/10/16	Range from 0.4 ºC to 4.3 ºC
BP-MW01-EM11	440-155280-4	08/10/16	Range from 0.4 ºC to 4.3 ºC
BP-IW02-EM11	440-155280-5	08/10/16	Range from 0.4 ºC to 4.3 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	Yes/No/Yes
All: Several coolers were received at temperatures < 2ºC. No qualification.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: Equipment blank FieldQC-EM11-EB and field blank FieldQC-EM11-FB are in SDG 440-155949-1.	
6010B: Aluminum was detected in method blank MB 440-350185/1-A above the RL. Aluminum was not detected in the samples. Several metals were detected in calibration blanks above the MDL: ICB 440-350441/7: silver; CCB 440-350441/15: iron and magnesium; CCB 440-350441/41: sodium. The concentrations in the field samples were either >10x the amount in the blank or not detected. No qualification was applied. Dissolved metals detected in FIELDQC-EM11-EB include calcium, magnesium, silicon, sodium, and zinc. Metals detected in FIELDQC-EM11-FB include dissolved aluminum, iron, and silicon. In most cases, the sample results were either ND or greater than 10x the amount in the blank. Zinc and total iron will be qualified in some samples.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
314.0 MS/MSD ran on an unrelated sample. Perchlorate MSD recovery was high. No qualification.	
351.2: MS/MSD ran on an unrelated sample. TKN recoveries and RPD were outside limits. No qualification.	
365.3: MS/MSD ran on an unrelated sample. Phosphorus recoveries and RPD were outside limits. No qualification.	
6010B: MS/MSD ran on BP-MW06-EM11. Recoveries were outside limits for calcium, magnesium (MS only), and sodium. Concentrations in the parent sample were >4x the amount spiked. No qualification needed.	
RSK-175: MS/MSD not analyzed.	
VFA: MS/MSD ran on BP-MW01-EM11. The following recoveries were low: formic acid, lactic acid, n-butyric acid. Pyruvic acid recovery was high, but it was not detected in the parent sample.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standard ICSA 440-350441/8, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. The interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/N/A
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Lab duplicates only	

Validated by: Maureen McMyler 09/07/16 (revised 05/04/17)

Data Verification and Validation Summary

Project Name: NERT Bioremediation
Project No.: 100-TEN-T35908
No. of Samples: 5
SDG/Report No.: 440-155522-1
Lab ID: Test America – Irvine
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	BP-IW01-EM11: Qualify TOC "J".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Initial Calibration		X	No	None
5. Continuing Calibration Verification		X	No	None
6. Blanks		X	No	None
7. Surrogates/Monitoring Compounds		X	No	None
8. Matrix Spike/Matrix Spike Duplicate	X		No	None
9. Laboratory Control Samples		X	No	None
10. Interference Check Samples	X		No	None
11. Serial Dilution		X	No	None
12. Internal Standards		X	No	None
13. Compound Quantitation and Reporting Limits	X		Yes	All: Qualify detections between the MDL and RL "J".
14. Duplicates		X	No	None

Verification and Validation Label	Stage_2B_Validation_Manual
Verification and Validation Label Code	S2BVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "J", estimated, are useable for limited purposes only. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature
BH-01-EM11	440-155522-1	08/11/16	4.5 ºC
PC-98R-EM11	440-155522-2	08/11/16	4.5 ºC
MW-K5-EM11	440-155522-3	08/11/16	4.5 ºC
BP-IW01-EM11	440-155522-4	08/11/16	4.5 ºC
BP-IW03-EM11	440-155522-5	08/11/16	4.5 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at 4ºC (+ or – 2ºC)? Were samples received in proper condition?	No/Yes/Yes
SM 5310B: BP-IW01-EM11 was not preserved to pH<2. The lab adjusted the pH of the sample to the pH<2 prior to analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ 20% or Coefficient of Correlation ≥ 0.995?	Yes/Yes

5. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method requirements?	Yes/Yes/Yes

6. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
Note: Equipment blank FieldQC-EM11-EB and field blank FieldQC-EM11-FB are in SDG 440-155949-1.	
6010B: Several metals were detected in calibration blanks above the MDL: ICB 440-350441/7: silver; CCB 440-350441/15: iron and magnesium; CCB 440-350441/41: sodium. The concentrations in the field samples were either >10x the amount in the blank or not detected. No qualification was applied. Dissolved metals detected in FIELDQC-EM11-EB include calcium, magnesium, silicon, sodium, and zinc. Metals detected in FIELDQC-EM11-FB include dissolved aluminum, iron, and silicon. The sample results were either ND or greater than 10x the amount in the blank.	

7. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

8. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
314.0: MS/MSD ran on a sample from another work order. Perchlorate recovery was high in MSD only. No qualification.	
6010B: MS/MSD ran on a sample from another work order. Several recoveries were outside acceptable limits. No qualification in this work order.	

9. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

10. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/No
6010B: Metals were detected in interference check standard ICSA 440-350441/8, several at negative concentrations. The absolute value of the concentrations were above the method detection limit. The interferents' concentrations in the sample were not comparable to levels in the ICS. No qualification will be applied.	

11. Serial Dilution	
Was a serial dilution analysis performed for each group of samples with the same matrix? Was a field blank used for the serial dilution analysis? For analytes with concentrations > 50X the method detection limit (MDL), is the %D < 10%?	Yes/No/N/A
Notes: Serial dilution ran for 6020 only.	

12. Internal Standards (IS)	
Is an IS Summary form present? Were the correct number of standards added to each sample? Is the percent relative intensity (%RI) in the samples within 60-125% of the response in the calibration blank?	Yes/Yes/Yes
Notes:	

13. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL but below the reporting limit are estimated and qualified "J".	

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Lab duplicates only.	

Validated by: Maureen McMyler 08/29/16 (revised 05/03/17)

Appendix F.2
Laboratory Data Packages

Appendix F.3
DVSR Database