Data Validation Summary Report
Parcel F Health Risk Assessment
Remedial Investigation Sampling
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Nevada Environmental Response Trust (NERT)
Henderson, Nevada
Revision 2

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ATTACHMENT

LIST OF ACRONYMS AND ABBREVIATIONS

CCB	Continuing Calibration Blank
NFG	National Functional Guidelines
DL	Detection Limit
DNR	Do Not Report
DQO	Data Quality Objectives
DUP	Laboratory Duplicate
DVR	Data Validation Report
DVSR	Data Validation Summary Report
EB	Equipment Blank
FD	Field Duplicate
HRA	Health Risk Assessment
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS/LCSD	Laboratory Control Sample / Laboratory Control Sample Duplicate
LDC	Laboratory Data Consultants, Inc.
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NDEP	Nevada Department of Environmental Protection
NERT	Nevada Environmental Response Trust
PAH	Polynuclear Aromatic Hydrocarbon
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PCDD/PCDF	Polychlorinated Dioxin and Dibenzofuran
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RRF	Relative Response Factor
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SIM	Selected Ion Monitoring
SQL	Sample Quantitation Limit
SRM	Standard Reference Material
SVOC	Semivolatile Organic Compound
TB	Trip Blank
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
ug/L	Micrograms per Liter
mg/L	Milligrams per Liter
pg/L	Picograms per Liter
pCi/L	Picocuries per Liter
pg/g	Picograms per Gram
ug/Kg	Micrograms per Kilogram
mg/Kg	Milligrams per Kilogram
pCi/g	Picocuries per Gram
%RSD	Percent Relative Standard Deviation
%D	Percent Difference
%R	Percent Recovery

1.0 INTRODUCTION

This data validation summary report (DVSR) has been prepared by Laboratory Data Consultants, Inc. (LDC) to assess the validity and usability of laboratory analytical data from the Parcel F Health Risk Assessment (HRA), Remedial Investigation Sampling conducted at the Nevada Environmental Response Trust (NERT) site in Henderson, Nevada. The assessment was performed by Ramboll ENVIRON as a part of the *Quality Assurance Project Plan, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada* dated July 2014 and included the collection and analyses of 52 environmental and quality control (QC) samples. The analyses were performed by the following methods:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW-846 Method 8260B
1,2,3-Trichloropropane and 1 ,4-Dioxane by EPA SW 846 Method 8260B in Selected Ion Monitoring (SIM) mode
Semivolatile Organic Compounds (SVOCs) by EPA SW-846 Method 8270C
Polynuclear Aromatic Hydrocarbons (PAHs) by EPA SW-846 Method 8270C in SIM mode
Chlorinated Pesticides by EPA SW-846 Method 8081A
Aroclor-1260 by EPA SW-846 Method 8082
Polychlorinated Dioxins and Dibenzofurans (PCDD/PCDFs) by EPA SW-846 Method 8290
Metals by EPA SW-846 Methods 6010B/6020A/7470A/7471A

Wet Chemistry:
Nitrate as NO3 and Nitrite as Nitrogen by EPA Method 300.0 and Nitrate/Nitrite as Nitrogen by Calculation Method (Anions)
Chlorate by EPA Method 300.1B
Perchlorate by EPA Method 314.0
Hexavalent Chromium by EPA SW-846 Method 7199

Radium-226 by EPA Method 903.0
Radium-228 by EPA Method 904.0
Isotopic Thorium by Method A-01-R

Laboratory analytical services were provided by TestAmerica, Inc. The samples were grouped into sample delivery groups (SDGs). The soil and water samples are associated with quality assurance and quality control (QA/QC) samples designed to document the data quality of the entire SDG or a sub-group of samples within an SDG. Table I is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample number, matrix, and validation level. Table II is a reference table that identifies the QC elements reviewed for each validation level per method, as applicable.

The laboratory analytical data were validated in accordance with procedures described in the Nevada Division of Environmental Protection (NDEP) *Data Verification and Validation Requirements - Supplement* established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada, April 13, 2009. Consistent with the NDEP requirements, one hundred percent of the water analytical data were validated according to Stage 2A and approximately ninety percent of the soil analytical data were validated according to Stage 2B data validation procedures and approximately ten percent of the soil samples were validated according to Stage 4 data validation procedures. The number of samples and percentage of samples validated to Stage 2A, Stage 2B, and Stage 4 for each method is presented in Table III.

The analytical data were evaluated for QA/QC based on the following documents: *Quality Assurance Project Plan, Revision 1, NERT Site, Henderson, Nevada,* July 2014; Nevada Department of Environmental Protection (NDEP) *Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas,* January 5 2012; *Multi Agency Radiological Laboratory Analytical*

Protocols (MARLAP) Manual, July 2014; a modified outline of the *USEPA National Functional Guidelines* (NFGs) *for Organic Superfund Methods Data Review* (January 2017), *for Inorganic Superfund Data Review* (January 2017), and *for High Resolution Superfund Method Data Review* (April 2016); 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; update V, July 2014.

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.

The PARCCS summary report evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Each analytical fraction has a separate section for each of the PARCCS criteria. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 14.0 presents a summary of the PARCCS criteria by comparing quantitative parameters with acceptability criteria defined in the project DQO's. Qualitative PARCCS criteria are also summarized in this section.

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 media.

Environmental and laboratory QA/QC samples assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include: trip blanks (TBs), equipment blanks (EBs), field duplicates (FDs), calibration blanks, laboratory blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSDs), sample reference material (SRM), matrix spike/matrix spike duplicates (MS/MSDs), and laboratory duplicates (DUPs).

Before conducting the PARCCS evaluation, the analytical data were validated according to the QAPP (July 2014), NFGs (USEPA 2017, 2017, 2016), and EPA SW 846 Test Methods. Samples not meeting the acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation.

J- Estimated The associated numerical value is an estimated quantity with a negative bias. The analyte was detected but the reported value may not be accurate or precise.

J+ Estimated The associated numerical value is an estimated quantity with a positive bias. The analyte was detected but the reported value may not be accurate or precise.

J Estimated The associated numerical value is an estimated quantity. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits but the exceedance was not sufficient to cause rejection of the data.

R Rejected The data is unusable (the analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.

U Nondetected Analyses were performed for the compound or analyte, but it was not detected.

UJ Estimated/Nondetected Analyses were performed for the analyte, but it was not detected and the sample quantitation or detection limit is an estimated quantity due to poor accuracy or precision.

DNR Do Not Report A more appropriate result is reported from another analysis or dilution.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

The hierarchy of flags is listed below:

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

Table IV lists the reason codes used. Reason codes explain why flags have been applied and identify possible limitations of data use. Reason codes are cumulative except when one of the flags is R then only the reason code associated to the R flag will be used.

Table V presents the overall qualified results after all the flags or validation qualifiers and associated reason codes have been applied.

Once the data are reviewed and qualified according to the QAPP, NFG, and EPA Test Methods, the data set is then evaluated using PARCCS criteria. PARCCS criteria provide an evaluation of overall data usability. The following is a discussion of PARCCS criteria as related to the project DQOs.

Precision is a measure of the agreement or reproducibility of analytical results under a given set of conditions. It is a quantity that cannot be measured directly but is calculated from reported concentrations. Precision is expressed as the relative percent difference (RPD):

$$RPD = (D1-D2)/\{1/2(D1+D2)\} \text{ X } 100$$

where:
D1 = reported concentration for the sample
D2 = reported concentration for the duplicate

Precision is primarily assessed by calculating an RPD from the reported concentrations 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 result 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 overall efficiency of the analytical method in recovering target analytes from an environmental matrix. A LCS is similar to an MS/MSD sample in that the LCS is spiked with the same target analytes prior to preparation and analysis. However, the LCS is prepared using a controlled interference-free matrix instead of a field sample aliquot. Laboratory reagent water or solid matrix is used to prepare an LCS. The LCS measures laboratory efficiency in recovering target analytes from either matrix in the absence of matrix interferences.

DUPs measure laboratory precision. DUPs are replicate samples and are prepared by taking two aliquots from one sample container. The analytical results for DUPs are reported as the RPD between the results of the two aliquots.

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 identically controlled conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the numerical QC limit in the LCS/LCSD, MS/MSD, DUPs, or field duplicates indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. Thus, the actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample heterogeneity, improper sample collection or handling, inconsistent sample preparation, and poor instrument stability. In some 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 considered to be estimates, RPD exceedances from these duplicate pairs do not suggest a significant impact on the data quality.

Accuracy is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is 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 MS, MSD, LCS, and samples containing surrogate spikes. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Surrogate spikes are either isotopically labeled compounds or compounds that are not typically detected in the samples. Surrogate spikes are added to every blank, environmental sample, LCS, MS/MSD, and standard, for all applicable organic analyses. Accuracy of inorganic analyses is determined using the percent recoveries 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, LCS/LCSD, and surrogate compounds added to environmental samples is evaluated with the acceptance criteria specified by the previously noted documents. 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.

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 laboratory blanks, calibration blanks, TBs, and EBs.

A laboratory 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 laboratory blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Laboratory blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

Initial and continuing calibration blanks (ICB/CCBs) consist of acidified laboratory grade water, which are injected at the beginning and at a regular frequency during each 12 - hour sample analysis run. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

Trip blanks are used to identify possible volatile organic contamination introduced into the sample during transport. A trip blank is a sample bottle filled in the laboratory with reagent-grade water and preserved to a pH less than 2 with hydrochloric acid or solid matrix. It is transported to the site, stored with the sample containers, and returned unopened to the laboratory for analysis.

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.

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 will be specific for each method and matrix analyzed. Holding time exceedance can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation.

Comparability is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability is also dependent upon other PARCCS criteria, because only when precision, accuracy, and representativeness are known can data sets be compared with confidence.

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 usable 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.

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet the DQOs. It is important that calibration requirements, detection limits (DLs), and PQLs presented in the QAPP are achieved and that target analytes can be detected at concentrations necessary to support the 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. PQLs are the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration point for the analyte. The laboratory is required to report detected analytes down to the SQL for this project. The laboratory uses a formatter that reports estimated values down to the MDL. In addition, sample results are compared to laboratory blank and field blank results to identify potential effects of laboratory background and field procedures on sensitivity.

The following sections present a review of QC data for each analytical method.

2.0 VOLATILE ORGANIC COMPOUNDS

A total of 49 soil samples and three water samples were analyzed for VOCs by EPA SW-846 Method 8260B. Additionally, a total of three water samples were analyzed for 1,2,3-trichloropropane and 1,4-dioxane by EPA SW-846 Method 8260B SIM. All VOC data were assessed to be valid since none of the 3,545 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

2.1 Precision and Accuracy

2.1.1 Instrument Calibration

Initial and continuing calibration results provide a means of evaluating accuracy within a particular SDG. Relative response factor (RRF), percent relative standard deviation (%RSD), and percent difference (%D) are the major parameters used to measure the effectiveness of instrument calibration. RRF is a measure of the relative spectral response of an analyte compared to its internal standard. %RSD is an expression of the linearity of instrument response. %D is a comparison of a continuing calibration instrumental response with its initial response. %RSD and %D exceedances suggest routine instrumental anomalies, which typically impact all sample results for the affected compounds.

The %RSDs met the acceptance criteria of 15 percent for each individual compound and 30 percent for calibration check compounds, or the coefficient of determination (r^2) was ≥ 0.990 in the initial calibration.

Fourteen dichlorodifluoromethane results were qualified as non-detected estimated (UJ). The %Ds in the initial and continuing calibration verifications were outside the method acceptance criteria of 20 percent. The details regarding the qualification of results are provided in Attachment A.

2.1.2 Surrogates

All surrogate %Rs met the laboratory acceptance criteria.

2.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs met the laboratory acceptance criteria.

2.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the acceptance the laboratory acceptance criteria

2.1.5 Internal Standards

All internal standard areas and retention times met the method acceptance criteria.

2.1.6 FD Samples

The field duplicate samples were evaluated for acceptable precision with RPDs for the compounds. All RPDs met the QAPP acceptance criteria.

2.1.7 Compound Quantitation and Target Identification

Raw data were evaluated for five soil samples. All compound quantitation and target identifications were acceptable for these Stage 4 samples.

2.2 Representativeness

2.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 14-day analysis holding time criteria for VOCs.

2.2.2 Blanks

Laboratory blanks, TBs, and EBs were collected and analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results based on the following criteria.

> Results Below the PQL If a sample result for the blank contaminant was less than the PQL and the sample result was less than or equal to 2 times the blank value, the sample result was qualified as detected estimated (J) at the reported concentration.
>
> Results Above the PQL If a sample result for the blank contaminant was greater than the PQL and the sample result was less than or equal to 2 times the blank contaminant value, the sample result was qualified as detected estimated (J+) at the reported concentration.
>
> No Action If a sample result for the blank contaminant was greater than 2 times the blank value, the result was not amended.

2.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

2.2.2.2 TBs

No contaminants were detected in the trip blanks for this analysis.

2.2.2.3 EBs

No contaminants were detected in the equipment blanks for this analysis.

2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the VOC data is regarded as acceptable.

2.4 Completeness

The completeness level attained for VOC field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

2.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

3.0 SEMIVOLATILE ORGANIC COMPOUNDS

A total of nine soil samples and one water sample were analyzed for SVOCs by EPA SW-846 Method 8270C. All SVOC data were assessed to be valid with the exception of one of the 628 total results, which were rejected based on LCS/LCSD %R. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

3.1 Precision and Accuracy

3.1.1 Instrument Calibration

The %RSDs met the acceptance criteria of 15 percent for each individual compound and 30 percent for calibration check compounds, or the coefficient of determination (r^2) was ≥ 0.990 in the initial calibration.

Seventeen benzidine and hexachlorocyclopentadiene results were qualified as non-detected estimated (UJ). The %Ds in the initial and continuing calibration verifications were outside the method acceptance criteria of 20 percent. The details regarding the qualification of results are provided in Attachment C.

3.1.2 Surrogates

No data were qualified due to a low acid surrogate %R when the %R was greater or equal to 10%.

3.1.3 MS/MSD Samples

No MS/MSDs were performed due to insufficient sample volume for this analysis.

3.1.4 LCS/LCSD Samples

As a result of severely low LCS/LCSD %Rs (i.e., 0%), the benzidine result in sample RISB-18-10.0-20170420-EB was qualified as rejected (R).

No data were qualified due to LCS/LCSD RPDs outside of the laboratory acceptance criteria, since the associated sample results were not detected.

The details regarding the qualification of results are provided in Attachment C.

3.1.5 Internal Standards

All internal standard areas and retention times met the method acceptance criteria.

3.1.6 FD Samples

No SVOCs were detected in FD samples.

3.1.7 Compound Quantitation and Target Identification

Raw data were evaluated for soil sample RI-19-5.0-20170420. All compound quantitation and target identifications were acceptable for this Stage 4 sample.

In instances where data were reextracted and reanalyzed by the laboratory, data were qualified as not reportable (DNR) by the validators in order to yield only one complete set of data for a given sample. For sample RI-18-10.0-20170420-EB, the results from the original analysis were considered most useable since the reextraction was performed outside the extraction holding time criteria.

3.2 Representativeness

3.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 14-day extraction for soils, 7-day extraction for waters and 40-day analysis holding time criteria for SVOCs.

3.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

3.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

3.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

3.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. The comparability of the SVOC data is regarded as acceptable.

3.4 Completeness

The completeness level attained for SVOC field samples was 99.8 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

3.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

4.0 POLYNUCLEAR AROMATIC HYDROCARBONS

A total of nine soil samples and one water sample were analyzed for PAHs by EPA SW-846 Method 8270C-SIM. All PAH data were assessed to be valid since none of the 160 total results which were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

4.1 Precision and Accuracy

4.1.1 Instrument Calibration

The %RSDs met the acceptance criteria of 15 percent or the coefficient of determination (r^2) was ≥ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verifications met the acceptance criteria of 20 percent.

4.1.2 Surrogates

All surrogate %Rs met the laboratory acceptance criteria.

4.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs met the laboratory acceptance criteria.

4.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the laboratory acceptance criteria.

4.1.5 Internal Standards

All internal standard areas and retention times met the method acceptance criteria.

4.1.6 FD Samples

No PAHs were detected in the FD samples.

4.1.7 Compound Quantitation and Target Identification

Raw data were evaluated for soil sample RI-19-5.0-20170420. All compound quantitation and target identifications were acceptable for this Stage 4 sample.

4.2 Representativeness

4.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 14-day extraction for soils, 7-day extraction for waters, and 40-day analysis holding time criteria for PAHs.

4.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

4.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

4.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

4.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the PAH data is regarded as acceptable.

4.4 Completeness

The completeness level attained for PAH field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

4.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

5.0 CHLORINATED PESTICIDES

A total of nine soil samples and one water sample were analyzed for chlorinated pesticides by EPA SW-846 Method 8081A. All chlorinated pesticide data were assessed to be valid since none of the 223 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

5.1 Precision and Accuracy

5.1.1 Instrument Calibration

The %RSDs met the acceptance criteria of 20 percent or the coefficient of determination (r^2) was ≥ 0.990 in the initial calibration. The %Ds in the initial calibration verifications and met the method acceptance criteria of 20 percent.

Ten results for aldrin, endrin ketone and gamma-BHC and were qualified as non-detected estimated (UJ). The %Ds in the continuing calibration verifications were outside the method acceptance criteria of 20 percent. The details regarding the qualification of results are provided in Attachment E.

5.1.2 Surrogates/Internal Standards

Forty-four results for samples RI-19-10.0-20170420 and RI-19-20.0-20170420 were qualified as non-detected estimated (UJ) due to surrogate %Rs below the laboratory acceptance criteria. The details regarding the qualification of results are provided in Attachment E.

All internal standard areas and retention times met the method acceptance criteria.

5.1.3 MS/MSD Samples

No MS/MSDs were performed for this analysis.

5.1.4 LCS Samples

All LCS %Rs met the laboratory acceptance criteria.

5.1.5 FD Samples

All FD RPDs met the QAPP acceptance criteria.

5.1.6 Compound Quantitation and Target Identification

Raw data were evaluated for soil sample RI-19-5.0-20170420. All compound quantitation and target identifications were acceptable for this Stage 4 sample.

5.2 Representativeness

5.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 14-day extraction for soils, 7-day extraction for waters, and 40-day analysis holding time criteria for chlorinated pesticides.

5.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

5.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

5.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

5.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the chlorinated pesticide data is regarded as acceptable.

5.4 Completeness

The completeness level attained for chlorinated pesticide field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

5.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

6.0 AROCLOR-1260

A total of nine soil samples and one water sample were analyzed for Aroclor-1260 by EPA SW-846 Method 8082. All Aroclor-1260 data were assessed to be valid since none of the 10 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

6.1 Precision and Accuracy

6.1.1 Instrument Calibration

The %RSDs in the initial calibration and the %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

6.1.2 Surrogates/Internal Standards

All surrogate %Rs met the laboratory acceptance criteria.

All internal standard areas and retention times met the method acceptance criteria.

6.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs met the laboratory acceptance criteria.

6.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the laboratory acceptance criteria.

6.1.5 FD Samples

No Aroclor-1260 was detected in the FD samples.

6.1.6 Compound Quantitation and Target Identification

Raw data were evaluated for soil sample RI-19-5.0-20170420. All compound quantitation and target identifications were acceptable for this Stage 4 sample.

6.2 Representativeness

6.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 14-day extraction for soils, 7-day extraction for waters, and 40-day analysis holding time criteria for Aroclor-1260.

6.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

6.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

6.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

6.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. The comparability of the Aroclor-1260 data is regarded as acceptable.

6.4 Completeness

The completeness level attained for Aroclor-1260 field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

6.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

7.0 POLYCHLORINATED DIOXINS AND DIBENZOFURANS

A total of nine soil samples and one water sample were analyzed for PCDD/PCDFs by EPA SW-846 Method 8290. All PCDD/PCDF data were assessed to be valid since none of the 260 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

7.1 Precision and Accuracy

7.1.1 Instrument Calibration

The %RSDs in the initial calibration and the %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent for unlabeled compounds and 30 percent for labeled compounds. The ion abundance ratios met the method acceptance criteria.

7.1.2 MS/MSD Samples

No MS/MSDs were performed for this analysis.

7.1.3 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the laboratory acceptance criteria.

7.1.4 Internal Standards

All internal standard %Rs met the method acceptance criteria.

7.1.5 FD Samples

All FD RPDs met the QAPP acceptance criteria.

7.1.6 Compound Quantitation and Target Identification

Seventy results were qualified as estimated (J) as a result of compound quantitation non-conformances (i.e., results were reported by the laboratory as estimated maximum possible concentration (EMPC)). The details regarding the qualification of results are provided in Attachment G.

Raw data were evaluated for soil sample RI-19-5.0-20170420. All target identifications were acceptable for this Stage 4 sample.

7.2 Representativeness

7.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 30-day extraction and 45-day analysis holding time criteria for PCDD/PCDFs.

7.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results based on the following criteria.

> Results Below or Above the PQL If a sample result for the blank contaminant was less than or greater than the PQL and less than or equal to 5 times the blank value, the sample result was qualified as detected estimated (J) at the reported concentration.

No Action If a sample result for the blank contaminant was greater than 5 times the blank value, the result was not amended.

7.2.2.1 Laboratory blanks

As a result of contamination found in the laboratory blanks, 66 PCDD/PDCF results were qualified as detected estimated (J). The details regarding the qualification of results are provided in Attachment G.

7.2.2.2 EBs

No data were qualified due to contamination found in the equipment blanks.

7.3 Comparability

The laboratory used standard analytical methods for all of the analyses. The laboratory reported non-detect results at the sample specific estimated detection limit (EDL). In all cases, the EDLs attained were below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the PCDD/PCDF data is regarded as acceptable.

7.4 Completeness

The completeness level attained for PCDD/PCDF field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

7.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

8.0 METALS

A total of nine soil samples and one water sample were analyzed for metals by EPA SW-846 Methods 6010B/7470A/7471A; nine soil samples and one water sample were analyzed for metals by EPA SW-846 Methods 6020A; 25 soil samples and one water sample were analyzed for chromium by EPA SW-846 Method 6010B. All metal data were assessed to be valid with the exception of eight of the 256 total results, which were rejected based on MS/MSD %Rs. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

8.1 Precision and Accuracy

8.1.1 Instrument Calibration

Initial and continuing calibration verification results provide a means of evaluating accuracy within a particular SDG. Correlation coefficient (r) and percent recovery (%R) are the two major parameters used to measure the effectiveness of instrument calibration. The correlation coefficient indicates the linearity of the calibration curve. %R is used to verify the ongoing calibration acceptability of the analytical system. The most critical of the two calibration parameters, r, has the potential to affect data accuracy across an SDG when it is outside the acceptable QC limits. %R exceedances suggest more routine instrumental anomalies, which typically impact all sample results for the affected analytes.

The correlation coefficients in the initial calibrations were within the acceptance criteria of ≥ 0.995.

The mercury result for sample RI-19-30.0-20170420 was qualified as detected estimated (J+) due to the CRQL standards above the method acceptance criteria of 70-130%.

The details regarding the qualification of results are provided in Attachment H.

8.1.2 MS/MSD Samples

As a result of grossly exceeded MS/MSD %Rs (e.g., < 30%), eight niobium and tungsten results were qualified as rejected (R). Additionally, nine antimony and tungsten results were qualified as non-detected estimated (UJ) due to MS/MSD %Rs below the laboratory acceptance criteria.

Fourteen results were qualified as detected estimated (J) or non-detected estimated (UJ) due to MS/MSD RPDs above the laboratory acceptance criteria. The analytes were tungsten and zirconium.

The details regarding the qualification of results are provided in Attachment H.

8.1.3 LCS/SRM Samples

All LCS and SRM %Rs met the laboratory acceptance criteria.

8.1.4 ICP Interference Check Sample

All ICP interference check %Rs met the method acceptance criteria.

8.1.5 ICP Serial Dilution

As a result of serial dilution %Ds exceeding method acceptance criteria, 54 barium, iron, magnesium, phosphorus, strontium, and vanadium results were qualified as detected estimated (J). The details regarding the qualification of results are provided in Attachment H.

8.1.6 Internal Standards

All internal standard %Rs met the method acceptance criteria.

8.1.7 FD Samples

The barium results in field duplicate samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD were qualified as detected estimated (J) due to RPDs above the QAPP acceptance criteria. The details regarding the qualification of results are provided in Attachment H.

8.1.8 Sample Result Verification

Raw data were evaluated for soil sample RI-19-5.0-20170420 for metals by EPA Methods 6010B/6020A/7471A and soil samples RI-19-5.0-20170420, RI-19-40-20170420 and RI-19-50-20170420 for chromium by EPA Method 6010B. All reported sample results were greater than the SQL and were correctly calculated for these Stage 4 samples.

8.2 Representativeness

8.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 28-day analysis holding time criteria for mercury and 180-day analysis holding time criteria for all other metals.

8.2.2 Blanks

Laboratory blanks, ICB/CCBs, and EBs were collected and analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results based on the following criteria.

> Results Below the PQL If a sample result and blank contaminant value were less than the PQL, the sample result was amended as estimated (J) at the reported concentration.
>
> Results Above the PQL If a sample result and blank contaminant value were greater than the PQL and the sample result was less than 10 times the blank contaminant value, the sample result was qualified as detected estimated (J+) at the reported concentration.
>
> No Action If blank contaminant values were less than the PQL and associated sample results were greater than the PQL, or if blank contaminant values were greater than the PQL and associated sample results were greater than 10 times the blank contaminant value, the result was not qualified.

8.2.2.1 Laboratory and Calibration Blanks

No data were qualified due to contaminants detected in the laboratory and calibration blanks.

8.2.2.2 EBs

No data were qualified due to contaminants detected in the equipment blanks.

8.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the metals data is regarded as acceptable.

8.4 Completeness

The completeness level attained for metal field samples was 96.8 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

8.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

9.0 WET CHEMISTRY

A total of 34 soil samples and two water samples were analyzed for chlorate by EPA Method 300.1B, and anions by EPA Method 300.0, and Calculation Method; nine soil samples and one water sample were analyzed for hexavalent chromium by EPA SW-846 Method 7199; 47 soil samples and two water samples were analyzed for perchlorate by EPA Method 314.0. All wet chemistry data were assessed to be valid since none of the 203 total results which were rejected based on holding time exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

9.1 Precision and Accuracy

9.1.1 Instrument Calibration

Instrument calibrations were evaluated for all wet chemistry methods. The correlation coefficients in the initial calibrations were within the acceptance criteria of ≥ 0.995 and the %Rs in the initial and continuing calibration verifications met the acceptance criteria of 90-110%.

9.1.2 Surrogate

Surrogates were evaluated for chlorate by EPA Method 300.1B. All surrogate %Rs met the laboratory acceptance criteria.

9.1.3 MS/MSD Samples

Twenty-seven perchlorate results were qualified as detected estimated (J) or non-detected estimated (UJ) due to MS/MSD %Rs below the laboratory acceptance criteria. Additionally, 28 nitrate as nitrate, nitrite as nitrogen, and nitrate/nitrite as nitrogen results were qualified as detected estimated (J+) or non-detected estimated (UJ) due to MS/MSD %Rs both below and above the laboratory acceptance criteria.

Fourteen perchlorate results were qualified as detected estimated (J) or non-detected estimated (UJ) due to MS/MSD RPDs above the laboratory acceptance criteria.

The details regarding the qualification of results are provided in Attachment I.

9.1.4 LCS Samples

All LCS %Rs met the laboratory acceptance criteria.

9.1.5 FD Samples

The nitrate/nitrite as nitrogen, perchlorate, and nitrate as NO3 results in field duplicate samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD were qualified as detected estimated (J) due to RPDs above the QAPP acceptance criteria. The details regarding the qualification of results are provided in Attachment I.

9.1.6 Sample Result Verification

Raw data were evaluated for five soil samples for anions, chlorate, and perchlorate and four soil samples for hexavalent chromium. All reported sample results were greater than the SQL and were correctly calculated for these Stage 4 samples.

9.2 Representativeness

9.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with all wet chemistry methods was conducted. All samples met the 28-day analysis holding time criteria for chlorate and perchlorate and the 24-hour analysis holding time criteria for hexavalent chromium.

As a result of analysis holding time exceedance, the anion results in sample RI-19-90.0-20170420 were qualified as detected estimated (J-) or non-detected estimated (UJ). The details regarding the qualification of results are presented in Attachment I.

9.2.2 Blanks

Laboratory blanks, ICB/CCBs, and EBs were collected and analyzed to evaluate representativeness.

9.2.2.1 Laboratory and Calibration Blanks

No contaminants were detected in the laboratory and calibration blanks for this analysis.

9.2.2.2 EBs

No data were qualified due to contaminants detected in the equipment blanks.

9.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the wet chemistry data is regarded as acceptable.

9.4 Completeness

The completeness level attained for wet chemistry field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

9.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

10.0 RADIUM-226

A total of nine soil samples and one water sample were analyzed for radium-226 by EPA Method 903.0. All radium-226 data were assessed to be valid since none of the ten total results were rejected based on holding time and QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

10.1 Precision and Accuracy

10.1.1 Instrument Calibration

All instruments and detectors were calibrated as required. Detector efficiency was determined for each radionuclide of interest. Continuing calibration and background determination was performed at the required frequencies. Results met the method acceptance criteria.

10.1.2 Carrier

All carrier %R met the method acceptance criteria.

10.1.3 DUP Samples

All DUP RPDs met the QAPP acceptance criteria.

10.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the laboratory acceptance criteria.

10.1.5 FD Samples

All FD RPDs met the QAPP acceptance criteria.

10.1.6 Isotope Quantitation and Target Identification

Raw data were evaluated for sample RI-19-5.0-20170420. All isotope quantitation and target identifications were acceptable for this Stage 4 sample.

10.2 Representativeness

10.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 180-day analysis holding time criteria for radium-226.

10.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

10.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

10.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

10.3 Comparability

The laboratory used standard analytical methods for all of the analyses. The laboratory reported non-detect results at the sample specific minimum detectable activities (MDAs). In all cases, the MDAs attained were at or below the PQLs. The comparability of the radium-226 data is regarded as acceptable.

10.4 Completeness

The completeness level attained for radium-226 field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

10.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

11.0 RADIUM-228

A total of nine soil samples and one water sample were analyzed for radium-228 by EPA Method 904.0. All radium-228 data were assessed to be valid since none of the ten total results were rejected based on holding time and QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

11.1 Precision and Accuracy

11.1.1 Instrument Calibration

All instruments and detectors were calibrated as required. Detector efficiency was determined for each radionuclide of interest. Continuing calibration and background determination was performed at the required frequencies. Results met the method acceptance criteria.

11.1.2 Carrier

All carrier %R met the method acceptance criteria.

11.1.3 DUP Samples

All DUP RPDs met the QAPP acceptance criteria.

11.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs met the laboratory acceptance criteria.

11.1.5 FD Samples

All FD RPDs met the QAPP acceptance criteria.

11.1.6 Isotope Quantitation and Target Identification

Raw data were evaluated for sample RI-19-5.0-20170420. All isotope quantitation and target identifications were acceptable for this Stage 4 sample.

11.2 Representativeness

11.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 180-day analysis holding time criteria for radium-228.

11.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

11.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

11.2.2.2 EBs

No contaminants were detected in the equipment blanks for this analysis.

11.3 Comparability

The laboratory used standard analytical methods for all of the analyses. The laboratory reported non-detect results at the sample specific MDAs. In all cases, the MDAs attained were at or below the PQLs. The comparability of the radium-228 data is regarded as acceptable.

11.4 Completeness

The completeness level attained for radium-228 field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

11.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

12.0 ISOTOPIC THORIUM

A total of nine soil samples and one water sample were analyzed for isotopic thorium by Method A-01-R. All isotopic thorium data were assessed to be valid since none of the 30 total results were rejected based on holding time and QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

12.1 Precision and Accuracy

12.1.1 Instrument Calibration

All instruments and detectors were calibrated as required. Detector efficiency was determined for each radionuclide of interest. Continuing calibration and background determination was performed at the required frequencies. Results met the method acceptance criteria.

12.1.2 Tracer

All tracer %Rs met the method acceptance criteria.

12.1.3 DUP Samples

All DUP RPDs met the QAPP acceptance criteria.

12.1.4 LCS Samples

All LCS %Rs met the laboratory acceptance criteria.

12.1.5 FD Samples

All FD RPDs met the QAPP acceptance criteria.

12.1.6 Isotope Quantitation and Target Identification

Raw data were evaluated for sample RI-19-5.0-20170420. All isotope quantitation and target identifications were acceptable for this Stage 4 sample.

12.2 Representativeness

12.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 180-day analysis holding time criteria for isotopic thorium.

12.2.2 Blanks

Laboratory blanks and EBs were collected and analyzed to evaluate representativeness.

12.2.2.1 Laboratory blanks

No contaminants were detected in the laboratory blanks for this analysis.

12.2.2.2 EBs

No data were qualified due to contaminants detected in the equipment blanks.

12.3 Comparability

The laboratory used standard analytical methods for all of the analyses. The laboratory reported non-detect results at the sample specific MDAs. In all cases, the MDAs attained were at or below the PQLs. The comparability of the isotopic thorium data is regarded as acceptable.

12.4 Completeness

The completeness level attained for isotopic thorium field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

12.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

13.0 VARIANCES IN ANALYTICAL PERFORMANCE

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted in the laboratory case narratives.

14.0 SUMMARY OF PARCCS CRITERIA

The validation reports present the PARCCS results for all SDGs. Each PARCCS criterion is discussed in detail in the following sections.

14.1 Precision and Accuracy

Precision and accuracy were evaluated using data quality indicators such as calibration, surrogates, MS/MSD, DUP, LCS/LCSD, serial dilution, and field duplicates. The precision and accuracy of the data set were considered acceptable after integration of result qualification.

All calibrations were performed as required and met the acceptance criteria with the exceptions noted in Sections 2.1.1, 3.1.1, 5.1.1, and 8.1.1. All surrogate, MS/MSD, DUP, LCS/LCSD, internal standard, serial dilution, and field duplicate percent recoveries, RPDs, and areas met acceptance criteria with the exceptions noted in Sections 3.1.4, 5.1.2, 8.1.2, 8.1.5, 8.1.7, 9.1.3, and 9.1.5. All ICP interference check sample %Rs met acceptance criteria.

14.2 Representativeness

All samples for each method and matrix were evaluated for holding time compliance. All holding times were met with the exceptions noted in Sections 9.2.1. All samples were associated with a laboratory blank in each individual SDG. The representativeness of the project data is considered acceptable after integration of result qualification.

14.3 Comparability

Sampling frequency requirements were met in obtaining necessary equipment blanks, field blanks and field duplicates. The laboratory used standard analytical methods for the analyses. The analytical results were reported in correct standard units. Sample integrity criteria were met. Sample preservation and holding times were within QC criteria with the exceptions noted in Sections 9.1.2. The overall comparability is considered acceptable after integration of result qualification.

14.4 Completeness

Of the 5,335 total analytes reported, nine sample results were rejected. The completeness for the SDGs is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
VOCs	3,545	0	100
SVOCs	628	1	99.8
PAHs	160	0	100
Chlorinated Pesticides	223	0	100
Aroclor-1260	10	0	100
PCDD/PCDFs	260	0	100
Metals	256	8	96.8
Wet Chemistry	203	0	100
Radium-226	10	0	100
Radium-228	10	0	100
Isotopic Thorium	30	0	100
Total	**5335**	**9**	**99.8**

The completeness percentage based on rejected data met the 90 percent DQO goal.

14.5 Sensitivity

Sensitivity was achieved by the laboratory to support the DQOs. Calibration concentrations and PQLs met the project requirements and low level contamination in the laboratory blanks, ICB/CCBs, and EBs did not affect sensitivity.

15.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical data quality assessment for the soil and water sample laboratory analytical results generated during the Parcel F HRA Remedial Investigation Sampling at the NERT site in Henderson, Nevada established that the overall project requirements and completeness levels were met. The sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 2A, Stage 2B, and Stage 4 data validation all other results are considered valid and usable for all purposes.

16.0 REFERENCES

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USEPA 2014. Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual. July.

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Region 9 Superfund Data Evaluation/Validation Guidance, R6QA/006.1, Draft. December 2001.

____.1996. 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; update V, July 2014.

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TABLES

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	VOCs (8260B)	1,2,3-TCP & 1,4-Diox (8260B-SIM)	SVOCs (8270C)	PAHs (8270C- SIM)	Pest. (8081A)	Aroclor-1260 (8082)	Metals (6010B/7470A/7471A)	(4) Metals (6020A)	Cr (6010B)
39210A	440-182697-2	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B									
39210A	440-182697-2	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B									
39210A	440-182697-2	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A									
39210A	440-182697-2	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B									
39210A	440-182697-2	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD1	Stage 2B									
39210A	440-182697-2	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD1	Stage 2B									
39210B	440-182697-3	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B								X	
39210B	440-182697-3	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B								X	
39210B	440-182697-3	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A								X	
39210B	440-182697-3	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B								X	
39210B	440-182697-3	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD2	Stage 2B								X	
39210B	440-182697-3	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD2	Stage 2B								X	
39210C	440-182699-2	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4									
39210C	440-182699-2	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B									
39210C	440-182699-2	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B									
39210C	440-182699-2	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B									
39210D	440-182699-3	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4								X	
39210D	440-182699-3	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B								X	
39210D	440-182699-3	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B								X	
39210D	440-182699-3	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B								X	
39210E	440-182697-1	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B	X		X	X	X	X	X		
39210E	440-182697-1	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B	X		X	X	X	X	X		
39210E	440-182697-1	RI-18-10.0-20170420-EBTB	440-182697-3	Water	4/20/2017	TB	Stage 2A	X	X							
39210E	440-182697-1	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A	X	X	X	X	X	X	X		
39210E	440-182697-1	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B	X		X	X	X	X	X		
39210E	440-182697-1	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD3	Stage 2B	X		X	X	X	X	X		
39210E	440-182697-1	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD3	Stage 2B	X		X	X	X	X	X		
39210E	440-182697-1	RI-18-40.0-20170420	440-182697-8	Soil	4/20/2017		Stage 2B	X								X
39210E	440-182697-1	RI-18-50.0-20170420	440-182697-9	Soil	4/20/2017		Stage 2B	X								X
39210E	440-182697-1	RI-18-60.0-20170420	440-182697-10	Soil	4/20/2017		Stage 2B	X								X
39210E	440-182697-1	RI-18-70.0-20170420	440-182697-11	Soil	4/20/2017		Stage 2B	X								X
39210E	440-182697-1	RI-18-80.0-20170420	440-182697-12	Soil	4/20/2017		Stage 2B	X								X
39210E	440-182697-1	RI-18-90.0-20170420	440-182697-13	Soil	4/20/2017		Stage 2B	X								X
39210F	440-182699-1	RI-19-5.0-20170420-TB	440-182699-1	Soil	4/20/2017	TB	Stage 2B	X								
39210F	440-182699-1	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4	X		X	X	X	X	X		

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	VOCs (8260B)	1,2,3-TCP & 1,4-Diox (8260B-SIM)	SVOCs (8270C)	PAHs (8270C- SIM)	Pest. (8081A)	Aroclor-1260 (8082)	Metals (6010B/7470A/7471A)	(4) Metals (6020A)	Cr (6010B)
39210F	440-182699-1	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 4	X								
39210F	440-182699-1	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B			X	X	X	X	X		
39210F	440-182699-1	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 4	X								
39210F	440-182699-1	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B			X	X	X	X	X		
39210F	440-182699-1	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 4	X								
39210F	440-182699-1	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B			X	X	X	X	X		
39210F	440-182699-1	RI-19-40.0-20170420	440-182699-6	Soil	4/20/2017		Stage 4									
39210F	440-182699-1	RI-19-40.0-20170420	440-182699-6	Soil	4/20/2017		Stage 4	X								X
39210F	440-182699-1	RI-19-50.0-20170420	440-182699-7	Soil	4/20/2017	FD4	Stage 4									X
39210F	440-182699-1	RI-19-50.0-20170420	440-182699-7	Soil	4/20/2017	FD4	Stage 2B	X								
39210F	440-182699-1	RI-19-50.0-20170420-FD	440-182699-8	Soil	4/20/2017	FD4	Stage 4									X
39210F	440-182699-1	RI-19-50.0-20170420-FD	440-182699-8	Soil	4/20/2017	FD4	Stage 2B	X								
39210F	440-182699-1	RI-19-60.0-20170420	440-182699-9	Soil	4/20/2017		Stage 2B	X								X
39210F	440-182699-1	RI-19-60.0-20170420-EB	440-182699-10	Water	4/20/2017	EB	Stage 2A	X	X							X
39210F	440-182699-1	RI-19-70.0-20170420	440-182699-11	Soil	4/20/2017		Stage 2B	X								X
39210F	440-182699-1	RI-19-80.0-20170420	440-182699-12	Soil	4/20/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-90.0-20170420-TB	440-182777-1	Soil	4/20/2017	TB	Stage 2B	X								
39210G	440-182777-1	RI-19-90.0-20170420	440-182777-2	Soil	4/20/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-95.0-20170420	440-182777-3	Soil	4/20/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-100.0-20170421	440-182777-4	Soil	4/21/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-105.0-20170421	440-182777-5	Soil	4/21/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-110.0-20170421	440-182777-6	Soil	4/21/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-115.0-20170421	440-182777-7	Soil	4/21/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-120.0-20170421	440-182777-8	Soil	4/21/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-125.0-20170421	440-182777-9	Soil	4/21/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-130.0-20170421	440-182777-10	Soil	4/21/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-135.0-20170421	440-182777-11	Soil	4/21/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-140.0-20170421	440-182777-12	Soil	4/21/2017		Stage 2B	X								X
39210G	440-182777-1	RI-19-145.0-20170421	440-182777-13	Soil	4/21/2017		Stage 2B	X								
39210G	440-182777-1	RI-19-150.0-20170421	440-182777-14	Soil	4/21/2017		Stage 2B	X								X
39210H	440-182779-1	RI-18-95.0-20170421	440-182779-1	Soil	4/21/2017		Stage 2B	X								
39210H	440-182779-1	RI-18-100.0-20170421	440-182779-2	Soil	4/21/2017		Stage 2B	X								X
39210H	440-182779-1	RI-18-105.0-20170421	440-182779-3	Soil	4/21/2017		Stage 2B	X								
39210H	440-182779-1	RI-18-110.0-20170421	440-182779-4	Soil	4/21/2017		Stage 2B	X								X

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	VOCs (8260B)	1,2,3-TCP & 1,4-Diox (8260B-SIM)	SVOCs (8270C)	PAHs (8270C- SIM)	Pest. (8081A)	Aroclor-1260 (8082)	Metals (6010B/7470A/7471A)	(4) Metals (6020A)	Cr (6010B)
39210H	440-182779-1	RI-18-115.0-20170421	440-182779-5	Soil	4/21/2017		Stage 2B	X								
39210H	440-182779-1	RI-18-120.0-20170421	440-182779-6	Soil	4/21/2017		Stage 2B	X								X
39210H	440-182779-1	RI-18-125.0-20170421	440-182779-7	Soil	4/21/2017	FD5	Stage 2B	X								
39210H	440-182779-1	RI-18-125.0-20170421-FD	440-182779-8	Soil	4/21/2017	FD5	Stage 2B	X								
39210H	440-182779-1	RI-18-130.0-20170421	440-182779-9	Soil	4/21/2017		Stage 2B	X								X
39210H	440-182779-1	RI-18-135.0-20170421	440-182779-10	Soil	4/21/2017		Stage 2B	X								
39210H	440-182779-1	RI-18-140.0-20170421	440-182779-11	Soil	4/21/2017		Stage 2B	X								X
39210H	440-182779-1	RI-18-145.0-20170421	440-182779-12	Soil	4/21/2017		Stage 2B	X								
39210H	440-182779-1	RI-18-150.0-20170421	440-182779-13	Soil	4/21/2017		Stage 2B	X								X

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	Dioxins (8290)	Anions (300.0/Calc)	ClO3 (300.1B)	ClO4 (314.0)	Cr6+ (7199)	Ra-226 (903.0)	Ra-228 (904.0)	Iso. Th (A-01-R)
39210A	440-182697-2	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B	X							
39210A	440-182697-2	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B	X							
39210A	440-182697-2	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A	X							
39210A	440-182697-2	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B	X							
39210A	440-182697-2	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD1	Stage 2B	X							
39210A	440-182697-2	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD1	Stage 2B	X							
39210B	440-182697-3	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B						X	X	X
39210B	440-182697-3	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B						X	X	X
39210B	440-182697-3	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A						X	X	X
39210B	440-182697-3	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B						X	X	X
39210B	440-182697-3	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD2	Stage 2B						X	X	X
39210B	440-182697-3	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD2	Stage 2B						X	X	X
39210C	440-182699-2	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4	X							
39210C	440-182699-2	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B	X							
39210C	440-182699-2	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B	X							
39210C	440-182699-2	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B	X							
39210D	440-182699-3	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4						X	X	X
39210D	440-182699-3	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B						X	X	X
39210D	440-182699-3	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B						X	X	X
39210D	440-182699-3	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B						X	X	X
39210E	440-182697-1	RI-18-5.0-20170420	440-182697-1	Soil	4/20/2017		Stage 2B		X	X	X	X			
39210E	440-182697-1	RI-18-10.0-20170420	440-182697-2	Soil	4/20/2017		Stage 2B		X	X	X	X			
39210E	440-182697-1	RI-18-10.0-20170420-EBTB	440-182697-3	Water	4/20/2017	TB	Stage 2A								
39210E	440-182697-1	RI-18-10.0-20170420-EB	440-182697-4	Water	4/20/2017	EB	Stage 2A		X	X	X	X			
39210E	440-182697-1	RI-18-20.0-20170420	440-182697-5	Soil	4/20/2017		Stage 2B		X	X	X	X			
39210E	440-182697-1	RI-18-30.0-20170420	440-182697-6	Soil	4/20/2017	FD3	Stage 2B		X	X	X	X			
39210E	440-182697-1	RI-18-30.0-20170420-FD	440-182697-7	Soil	4/20/2017	FD3	Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-40.0-20170420	440-182697-8	Soil	4/20/2017		Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-50.0-20170420	440-182697-9	Soil	4/20/2017		Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-60.0-20170420	440-182697-10	Soil	4/20/2017		Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-70.0-20170420	440-182697-11	Soil	4/20/2017		Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-80.0-20170420	440-182697-12	Soil	4/20/2017		Stage 2B		X	X	X				
39210E	440-182697-1	RI-18-90.0-20170420	440-182697-13	Soil	4/20/2017		Stage 2B		X	X	X				
39210F	440-182699-1	RI-19-5.0-20170420-TB	440-182699-1	Soil	4/20/2017	TB	Stage 2B								
39210F	440-182699-1	RI-19-5.0-20170420	440-182699-2	Soil	4/20/2017		Stage 4		X	X	X	X			

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	Dioxins (8290)	Anions (300.0/Calc)	ClO3 (300.1B)	ClO4 (314.0)	Cr6+ (7199)	Ra-226 (903.0)	Ra-228 (904.0)	Iso. Th (A-01-R)
39210F	440-182699-1	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 4		X	X	X	X			
39210F	440-182699-1	RI-19-10.0-20170420	440-182699-3	Soil	4/20/2017		Stage 2B								
39210F	440-182699-1	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 4		X	X	X	X			
39210F	440-182699-1	RI-19-20.0-20170420	440-182699-4	Soil	4/20/2017		Stage 2B								
39210F	440-182699-1	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 4		X	X	X	X			
39210F	440-182699-1	RI-19-30.0-20170420	440-182699-5	Soil	4/20/2017		Stage 2B								
39210F	440-182699-1	RI-19-40.0-20170420	440-182699-6	Soil	4/20/2017		Stage 4		X	X					
39210F	440-182699-1	RI-19-40.0-20170420	440-182699-6	Soil	4/20/2017		Stage 4				X				
39210F	440-182699-1	RI-19-50.0-20170420	440-182699-7	Soil	4/20/2017	FD4	Stage 4								
39210F	440-182699-1	RI-19-50.0-20170420	440-182699-7	Soil	4/20/2017	FD4	Stage 2B		X	X	X				
39210F	440-182699-1	RI-19-50.0-20170420-FD	440-182699-8	Soil	4/20/2017	FD4	Stage 4								
39210F	440-182699-1	RI-19-50.0-20170420-FD	440-182699-8	Soil	4/20/2017	FD4	Stage 2B		X	X	X				
39210F	440-182699-1	RI-19-60.0-20170420	440-182699-9	Soil	4/20/2017		Stage 2B		X	X	X				
39210F	440-182699-1	RI-19-60.0-20170420-EB	440-182699-10	Water	4/20/2017	EB	Stage 2A		X	X	X				
39210F	440-182699-1	RI-19-70.0-20170420	440-182699-11	Soil	4/20/2017		Stage 2B		X	X	X				
39210F	440-182699-1	RI-19-80.0-20170420	440-182699-12	Soil	4/20/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-90.0-20170420-TB	440-182777-1	Soil	4/20/2017	TB	Stage 2B								
39210G	440-182777-1	RI-19-90.0-20170420	440-182777-2	Soil	4/20/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-95.0-20170420	440-182777-3	Soil	4/20/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-100.0-20170421	440-182777-4	Soil	4/21/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-105.0-20170421	440-182777-5	Soil	4/21/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-110.0-20170421	440-182777-6	Soil	4/21/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-115.0-20170421	440-182777-7	Soil	4/21/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-120.0-20170421	440-182777-8	Soil	4/21/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-125.0-20170421	440-182777-9	Soil	4/21/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-130.0-20170421	440-182777-10	Soil	4/21/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-135.0-20170421	440-182777-11	Soil	4/21/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-140.0-20170421	440-182777-12	Soil	4/21/2017		Stage 2B		X	X	X				
39210G	440-182777-1	RI-19-145.0-20170421	440-182777-13	Soil	4/21/2017		Stage 2B				X				
39210G	440-182777-1	RI-19-150.0-20170421	440-182777-14	Soil	4/21/2017		Stage 2B		X	X	X				
39210H	440-182779-1	RI-18-95.0-20170421	440-182779-1	Soil	4/21/2017		Stage 2B				X				
39210H	440-182779-1	RI-18-100.0-20170421	440-182779-2	Soil	4/21/2017		Stage 2B		X	X	X				
39210H	440-182779-1	RI-18-105.0-20170421	440-182779-3	Soil	4/21/2017		Stage 2B				X				
39210H	440-182779-1	RI-18-110.0-20170421	440-182779-4	Soil	4/21/2017		Stage 2B		X	X	X				

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LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	Dioxins (8290)	Anions (300.0/Calc)	ClO3 (300.1B)	ClO4 (314.0)	Cr6+ (7199)	Ra-226 (903.0)	Ra-228 (904.0)	Iso. Th (A-01-R)
39210H	440-182779-1	RI-18-115.0-20170421	440-182779-5	Soil	4/21/2017		Stage 2B				X				
39210H	440-182779-1	RI-18-120.0-20170421	440-182779-6	Soil	4/21/2017		Stage 2B		X	X	X				
39210H	440-182779-1	RI-18-125.0-20170421	440-182779-7	Soil	4/21/2017	FD5	Stage 2B				X				
39210H	440-182779-1	RI-18-125.0-20170421-FD	440-182779-8	Soil	4/21/2017	FD5	Stage 2B				X				
39210H	440-182779-1	RI-18-130.0-20170421	440-182779-9	Soil	4/21/2017		Stage 2B		X	X	X				
39210H	440-182779-1	RI-18-135.0-20170421	440-182779-10	Soil	4/21/2017		Stage 2B				X				
39210H	440-182779-1	RI-18-140.0-20170421	440-182779-11	Soil	4/21/2017		Stage 2B		X	X	X				
39210H	440-182779-1	RI-18-145.0-20170421	440-182779-12	Soil	4/21/2017		Stage 2B				X				
39210H	440-182779-1	RI-18-150.0-20170421	440-182779-13	Soil	4/21/2017		Stage 2B		X	X	X				

Table II. Stage 2A, Stage 2B, and Stage 4 Validation Elements

Quality Control Elements	Stage 2A					
	GC/MS[1]	GC[2]	HR GC/MS[3]	Metals	Wet Chemistry	Rad[4]
Sample Receipt & Technical Holding Time	√	√	√	√	√	√
Instrument Performance Check	-	-	-	-	-	-
Initial Calibration (ICAL)	-	-	-	-	-	-
Initial Calibration Verification (ICV)	-	-	-	-	-	-
Continuing Calibration Verification (CCV)	-	-	-	-	-	-
Laboratory Blanks	√	√	√	√	√	√
Initial Calibration Blank and Continuing Calibration Blank (ICB/CCB)	**N/A**	**N/A**	**N/A**	√	√	**N/A**
Field Blanks	√	√	√	√	√	√
Inductively Coupled Plasma (ICP) Interference Check Sample	**N/A**	**N/A**	**N/A**	-	**N/A**	**N/A**
Surrogate Spikes/ Carrier Recovery	√	√	**N/A**	**N/A**	√	√
Matrix Spike (MS)/ Matrix Spike Duplicate (MSD)	√	√	√	√	√	√
Laboratory Duplicate (DUP)	**N/A**	**N/A**	**N/A**	**N/A**	√	√
Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	√	√	√	√	√	√
Serial Dilution	**N/A**	**N/A**	**N/A**	√	**N/A**	**N/A**
Internal Standards	-	-	-	-	**N/A**	**N/A**
Field Duplicate	√	√	√	√	√	√
RPD Between Two Columns	**N/A**	-	**N/A**	**N/A**	**N/A**	**N/A**
Project Quantitation Limits (PQL)[5]	√	√	√	√	√	√
Multiple Results for One Sample	√	√	√	√	√	√
Target Compound Identification	-	-	-	-	-	-
Compound Quantitation/ Sample Result Verification	-	-	-	-	-	-
System Performance[6]	-	-	-	-	-	-
Overall Data Usability Assessment	√	√	√	√	√	√

√ = Reviewed for Stage 2A review
N/A = Not applicable to method or not performed during this sampling event
- = Not applicable for Stage 2A review
[1]GC/MS = VOCs, SVOCs, and PAHs
[2]GC = Chlorinated Pesticides and Aroclor-1260
[3]HR GC/MS = PCDD/PCDFs
[4]Rad = Radium-226, Radium-228, and Isotopic Thorium
[5]PQLs verified for GC/MS, GC, Metals, and Wet Chemistry methods. For HR GC/MS, Estimated Detection Limits (EDLs) and for Rad, Minimum Detectable Activity (MDA).
[6]System performance is a thorough review of the data acquisition that can yield indicators of degrading instrument performance affecting quality of data.

Table II. Stage 2A, Stage 2B, and Stage 4 Validation Elements

Quality Control Elements	Stage 2B					
	GC/MS[1]	GC[2]	HR GC/MS[3]	Metals	Wet Chemistry	Rad[4]
Sample Receipt & Technical Holding Time	√	√	√	√	√	√
Instrument Performance Check	√	√	√	√	√	√
Initial Calibration (ICAL)	√	√	√	√	√	√
Initial Calibration Verification (ICV)	√	√	√	√	√	√
Continuing Calibration Verification (CCV)	√	√	√	√	√	√
Laboratory Blanks	√	√	√	√	√	√
Initial Calibration Blank and Continuing Calibration Blank (ICB/CCB)	**N/A**	**N/A**	**N/A**	√	√	**N/A**
Field Blanks	√	√	√	√	√	√
Inductively Coupled Plasma (ICP) Interference Check Sample	**N/A**	**N/A**	**N/A**	√	**N/A**	**N/A**
Surrogate Spikes/ Carrier Recovery	√	√	**N/A**	**N/A**	√	√
Matrix Spike (MS)/ Matrix Spike Duplicate (MSD)	√	√	√	√	√	√
Laboratory Duplicate (DUP)	**N/A**	**N/A**	**N/A**	**N/A**	√	√
Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	√	√	√	√	√	√
Serial Dilution	**N/A**	**N/A**	**N/A**	√	**N/A**	**N/A**
Internal Standards	√	√	√	√	**N/A**	**N/A**
Field Duplicate	√	√	√	√	√	√
RPD Between Two Columns	**N/A**	√	**N/A**	**N/A**	**N/A**	**N/A**
Project Quantitation Limits (PQL)[5]	√	√	√	√	√	√
Multiple Results for One Sample	√	√	√	√	√	√
Target Compound Identification	-	-	-	-	-	-
Compound Quantitation/ Sample Result Verification	-	-	-	-	-	-
System Performance[6]	-	-	-	-	-	-
Overall Data Usability Assessment	√	√	√	√	√	√

√ = Reviewed for Stage 2A review
N/A = Not applicable to method or not performed during this sampling event
- = Not applicable for Stage 2A review
[1]GC/MS = VOCs, SVOCs, and PAHs
[2]GC = Chlorinated Pesticides and Aroclor-1260
[3]HR GC/MS = PCDD/PCDFs
[4]Rad = Radium-226, Radium-228, and Isotopic Thorium
[5]PQLs verified for GC/MS, GC, Metals, and Wet Chemistry methods. For HR GC/MS, Estimated Detection Limits (EDLs) and for Rad, Minimum Detectable Activity (MDA).
[6]System performance is a thorough review of the data acquisition that can yield indicators of degrading instrument performance affecting quality of data.

Table II. Stage 2A, Stage 2B, and Stage 4 Validation Elements

Quality Control Elements	Stage 4					
	GC/MS[1]	GC[2]	HR GC/MS[3]	Metals	Wet Chemistry	Rad[4]
Sample Receipt & Technical Holding Time	√	√	√	√	√	√
Instrument Performance Check	√	√	√	√	√	√
Initial Calibration (ICAL)	√	√	√	√	√	√
Initial Calibration Verification (ICV)	√	√	√	√	√	√
Continuing Calibration Verification (CCV)	√	√	√	√	√	√
Laboratory Blanks	√	√	√	√	√	√
Initial Calibration Blank and Continuing Calibration Blank (ICB/CCB)	**N/A**	**N/A**	**N/A**	√	√	**N/A**
Field Blanks	√	√	√	√	√	√
Inductively Coupled Plasma (ICP) Interference Check Sample	**N/A**	**N/A**	**N/A**	√	**N/A**	**N/A**
Surrogate Spikes/ Carrier Recovery	√	√	**N/A**	**N/A**	√	√
Matrix Spike (MS)/ Matrix Spike Duplicate (MSD)	√	√	√	√	√	√
Laboratory Duplicate (DUP)	**N/A**	**N/A**	**N/A**	**N/A**	√	√
Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	√	√	√	√	√	√
Serial Dilution	**N/A**	**N/A**	**N/A**	√	**N/A**	**N/A**
Internal Standards	√	**N/A**	√	√	**N/A**	**N/A**
Field Duplicate	√	√	√	√	√	√
RPD Between Two Columns	**N/A**	√	**N/A**	**N/A**	**N/A**	**N/A**
Project Quantitation Limits (PQL)[5]	√	√	√	√	√	√
Multiple Results for One Sample	√	√	√	√	√	√
Target Compound Identification	√	√	√	**N/A**	**N/A**	**N/A**
Compound Quantitation/ Sample Result Verification	√	√	√	√	√	√
System Performance[6]	√	**N/A**	√	**N/A**	**N/A**	**N/A**
Overall Data Usability Assessment	√	√	√	√	√	√

√ = Reviewed for Stage 4 review
N/A = Not applicable to method or not performed during this sampling event
- = Not applicable for Stage 4 review
[1]GC/MS = VOCs, SVOCs, and PAHs
[2]GC = Chlorinated Pesticides and Aroclor-1260
[3]HR GC/MS = PCDD/PCDFs
[4]Rad = Radium-226, Radium-228, and Isotopic Thorium
[5]PQLs verified for GC/MS, GC, Metals, and Wet Chemistry methods. For HR GC/MS, Estimated Detection Limits (EDLs) and for Rad, Minimum Detectable Activity (MDA).
[6]System performance is a thorough review of the data acquisition that can yield indicators of degrading instrument performance affecting quality of data.

Table III. Stage 2A, Stage 2B & Stage 4 Validation Percentages

Parameter	Stage 2A (Water)	Stage 2A (%)	Stage 2B (Soil)	Stage 4 (Soil)	Total (Soil)	Stage 2B (%)	Stage 4 (%)
VOCs (8260B)	3	100	44	5	49	90	10
VOCs (8260B-SIM)	3	100	0	0	0	-	-
SVOCs	1	100	8	1	9	89	11
PAH	1	100	8	1	9	89	11
Chlorinated Pesticides	1	100	8	1	9	89	11
Aroclor-1260	1	100	8	1	9	89	11
Dioxins and Furans	1	100	8	1	9	89	11
Metals (6010B/7470A/7471A)	1	100	8	1	9	89	11
As, Nb, Sb, Tl (6020A)	1	100	8	1	9	89	11
Chromium (6010B)	1	100	22	3	25	88	12
Anions	2	100	29	5	34	85	15
Chlorate	2	100	29	5	34	85	15
Perchlorate	2	100	42	5	47	89	11
Hexavalent Chromium	1	100	5	4	9	56	44
Radium-226	1	100	8	1	9	89	11
Radium-228	1	100	8	1	9	89	11
Isotopic Thorium	1	100	8	1	9	89	11

Table IV. Reason Codes and Definitions

Reason Code	Explanation
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 (wells w/o dedicated pumps, when contamination is detected in the Pump Blk)
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	dual column confirmation %D exceeded
e	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
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 >SQL <PQL
st	sample receipt temperature exceeded
t	qualified due to elevated helium tracer concentrations
vh	volatile headspace detected in aqueous sample containers submitted for VOC analysis
x	qualified due to low % solids
z	qualified due to ICS results

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182697-1	RI-18-10.0-20170420	4/20/2017	8260	67-66-3	Chloroform	0.00065	J	0.00050	0.0010	mg/kg	J	sp
440-182697-1	RI-18-50.0-20170420	4/20/2017	8260	56-23-5	Carbon Tetrachloride	0.00097	J	0.00071	0.0029	mg/kg	J	sp
440-182697-1	RI-18-60.0-20170420	4/20/2017	8260	56-23-5	Carbon Tetrachloride	0.0026	J	0.00077	0.0031	mg/kg	J	sp
440-182697-1	RI-18-80.0-20170420	4/20/2017	8260	95-50-1	1,2-Dichlorobenzene	0.00091	J	0.00085	0.0017	mg/kg	J	sp
440-182699-1	RI-19-5.0-20170420-TB	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0010	0.0020	mg/kg	UJ	c
440-182699-1	RI-19-5.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0010	0.0020	mg/kg	UJ	c
440-182699-1	RI-19-10.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.00099	0.0020	mg/kg	UJ	c
440-182699-1	RI-19-20.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0013	0.0025	mg/kg	UJ	c
440-182699-1	RI-19-30.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0015	0.0030	mg/kg	UJ	c
440-182699-1	RI-19-40.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0015	0.0030	mg/kg	UJ	c
440-182699-1	RI-19-50.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0014	0.0028	mg/kg	UJ	c
440-182699-1	RI-19-50.0-20170420-FD	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0013	0.0027	mg/kg	UJ	c
440-182699-1	RI-19-60.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0015	0.0030	mg/kg	UJ	c
440-182699-1	RI-19-60.0-20170420	4/20/2017	8260	75-35-4	1,1-Dichloroethene	0.0014	J	0.00075	0.0030	mg/kg	J	sp
440-182699-1	RI-19-70.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0012	0.0025	mg/kg	UJ	c
440-182699-1	RI-19-80.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0012	0.0025	mg/kg	UJ	c
440-182699-1	RI-19-80.0-20170420	4/20/2017	8260	56-23-5	Carbon Tetrachloride	0.00069	J	0.00062	0.0025	mg/kg	J	sp
440-182777-1	RI-19-90.0-20170420-TB	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0010	0.0020	mg/kg	UJ	c
440-182777-1	RI-19-90.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0018	0.0035	mg/kg	UJ	c
440-182777-1	RI-19-95.0-20170420	4/20/2017	8260	75-71-8	Dichlorodifluoromethane		U	0.0017	0.0033	mg/kg	UJ	c
440-182777-1	RI-19-95.0-20170420	4/20/2017	8260	56-23-5	Carbon Tetrachloride	0.0019	J	0.00083	0.0033	mg/kg	J	sp
440-182777-1	RI-19-100.0-20170421	4/21/2017	8260	56-23-5	Carbon Tetrachloride	0.0024	J	0.00080	0.0032	mg/kg	J	sp
440-182779-1	RI-18-140.0-20170421	4/21/2017	8260	67-64-1	Acetone	0.018	J	0.014	0.034	mg/kg	J	sp
440-182697-1	RI-18-5.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.71	1.4	mg/kg	UJ	c
440-182697-1	RI-18-5.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.14	0.89	mg/kg	UJ	c
440-182697-1	RI-18-10.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.72	1.5	mg/kg	UJ	c
440-182697-1	RI-18-10.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.14	0.90	mg/kg	UJ	c
440-182697-1	RI-18-20.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.84	1.7	mg/kg	UJ	c
440-182697-1	RI-18-20.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.17	1.1	mg/kg	UJ	c
440-182697-1	RI-18-10.0-20170420-EB	4/20/2017	8270	92-87-5	Benzidine		U*	5.6	11	ug/l	R	l
440-182697-1	RI-18-30.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	2.0	4.0	mg/kg	UJ	c
440-182697-1	RI-18-30.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.40	2.5	mg/kg	UJ	c
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.40	2.5	mg/kg	UJ	c
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	8270	92-87-5	Benzidine		U	2.0	4.1	mg/kg	UJ	c
440-182699-1	RI-19-5.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.71	1.4	mg/kg	UJ	c
440-182699-1	RI-19-10.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.71	1.4	mg/kg	UJ	c
440-182699-1	RI-19-10.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.14	0.89	mg/kg	UJ	c
440-182699-1	RI-19-20.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	0.80	1.6	mg/kg	UJ	c
440-182699-1	RI-19-20.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.16	1.0	mg/kg	UJ	c
440-182699-1	RI-19-30.0-20170420	4/20/2017	8270	77-47-4	Hexachlorocyclopentadiene		U	0.42	2.6	mg/kg	UJ	c
440-182699-1	RI-19-30.0-20170420	4/20/2017	8270	92-87-5	Benzidine		U	2.1	4.2	mg/kg	UJ	c

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-1	RI-19-5.0-20170420	4/20/2017	8270CSIM	91-20-3	Naphthalene	0.010	J	0.0043	0.032	mg/kg	J	sp
440-182699-1	RI-19-5.0-20170420	4/20/2017	8081	53494-70-5	Endrin ketone		U	0.0022	0.0054	mg/kg	UJ	c
440-182699-1	RI-19-5.0-20170420	4/20/2017	8081	58-89-9	gamma-BHC		U	0.0016	0.0054	mg/kg	UJ	c
440-182699-1	RI-19-5.0-20170420	4/20/2017	8081	309-00-2	Aldrin		U	0.0016	0.0054	mg/kg	UJ	c
440-182699-1	RI-19-5.0-20170420	4/20/2017	8081	319-85-7	beta-BHC	0.0023	J	0.0016	0.0054	mg/kg	J	sp
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	309-00-2	Aldrin		U	0.0017	0.0056	mg/kg	UJ	c,s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	58-89-9	gamma-BHC		U	0.0017	0.0056	mg/kg	UJ	c,s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	72-54-8	4,4'-DDD		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	60-57-1	Dieldrin		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	8001-35-2	Toxaphene		U	0.056	0.22	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	319-86-8	delta-BHC		U	0.0017	0.011	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	72-55-9	4,4'-DDE		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	76-44-8	Heptachlor		U	0.0022	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	3424-82-6	2,4'-DDE		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	5103-71-9	alpha-Chlordane		U	0.0022	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	33213-65-9	Endosulfan II		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	1031-07-8	Endosulfan sulfate		U	0.0022	0.011	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	1024-57-3	Heptachlor epoxide		U	0.0022	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	53494-70-5	Endrin ketone		U	0.0022	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	959-98-8	Endosulfan I		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	50-29-3	4,4'-DDT		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	7421-93-4	Endrin aldehyde		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	5103-74-2	gamma-Chlordane		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	72-20-8	Endrin		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	319-84-6	alpha-BHC		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	72-43-5	Methoxychlor		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-10.0-20170420	4/20/2017	8081	319-85-7	beta-BHC		U	0.0017	0.0056	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	58-89-9	gamma-BHC		U	0.0018	0.0061	mg/kg	UJ	c,s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	309-00-2	Aldrin		U	0.0018	0.0061	mg/kg	UJ	c,s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	33213-65-9	Endosulfan II		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	1031-07-8	Endosulfan sulfate		U	0.0024	0.012	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	959-98-8	Endosulfan I		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	72-43-5	Methoxychlor		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	319-84-6	alpha-BHC		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	72-20-8	Endrin		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	5103-71-9	alpha-Chlordane		U	0.0024	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	1024-57-3	Heptachlor epoxide		U	0.0024	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	319-85-7	beta-BHC		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	50-29-3	4,4'-DDT		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	5103-74-2	gamma-Chlordane		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	72-54-8	4,4'-DDD		U	0.0018	0.0061	mg/kg	UJ	s

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	76-44-8	Heptachlor		U	0.0024	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	72-55-9	4,4'-DDE		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	319-86-8	delta-BHC		U	0.0018	0.012	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	8001-35-2	Toxaphene		U	0.061	0.24	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	3424-82-6	2,4'-DDE		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	60-57-1	Dieldrin		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	7421-93-4	Endrin aldehyde		U	0.0018	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-20.0-20170420	4/20/2017	8081	53494-70-5	Endrin ketone		U	0.0024	0.0061	mg/kg	UJ	s
440-182699-1	RI-19-30.0-20170420	4/20/2017	8081	53494-70-5	Endrin ketone		U	0.0063	0.016	mg/kg	UJ	c
440-182699-1	RI-19-30.0-20170420	4/20/2017	8081	309-00-2	Aldrin		U	0.0047	0.016	mg/kg	UJ	c
440-182699-1	RI-19-30.0-20170420	4/20/2017	8081	58-89-9	gamma-BHC		U	0.0047	0.016	mg/kg	UJ	c
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.32	JqB	0.020	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.15	JqB	0.037	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	0.65	JqB	0.023	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.15	JqB	0.037	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	3268-87-9	OCDD	0.72	JB	0.035	11	pg/g	J	bl,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	39001-02-0	OCDF	1.1	JB	0.057	11	pg/g	J	bl,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.19	JB	0.025	5.4	pg/g	J	bl,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	57117-31-4	2,3,4,7,8-PCDF	0.12	Jq	0.043	5.4	pg/g	J	k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	30402-15-4	PeCDF (total)	0.68	Jq	0.043	5.4	pg/g	J	k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.14	Jq	0.068	5.4	pg/g	J	k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.34	JqB	0.066	5.4	pg/g	J	k,sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.41	J	0.031	5.4	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.20	J	0.067	5.4	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.56	J	0.047	1.1	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	51207-31-9	2,3,7,8-TCDF	0.38	J	0.047	1.1	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.17	J	0.032	5.4	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	0.29	J	0.042	5.4	pg/g	J	sp
440-182697-2	RI-18-5.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.25	J	0.028	5.4	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.50	JqB	0.039	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.23	JqB	0.024	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	0.75	JqB	0.022	5.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.35	JB	0.020	5.4	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	57117-44-9	1,2,3,6,7,8-HxCDF	0.11	JB	0.047	5.4	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.32	JB	0.039	5.4	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	39001-02-0	OCDF	1.3	JB	0.055	11	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	3268-87-9	OCDD	1.9	JB	0.036	11	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.13	Jq	0.023	5.4	pg/g	J	k,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.25	Jq	0.025	5.4	pg/g	J	k,sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.12	J	0.026	5.4	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.10	J	0.051	5.4	pg/g	J	sp

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	51207-31-9	2,3,7,8-TCDF	0.15	J	0.037	1.1	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.41	JB	0.049	5.4	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.15	J	0.037	1.1	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.20	J	0.050	5.4	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.55	JqB	0.12	52	pg/l	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	38998-75-3	HpCDF (total)	1.7	JqB	0.13	52	pg/l	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.81	JqB	0.12	52	pg/l	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.48	JqB	0.091	52	pg/l	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	37871-00-4	HpCDD (total)	2.0	JqB	0.097	52	pg/l	J	bl,k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.25	JqB	0.050	6.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	0.62	JqB	0.026	6.4	pg/g	J	bl,k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	39001-02-0	OCDF	2.3	JB	0.14	100	pg/l	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.32	JB	0.032	6.4	pg/g	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.12	JB	0.028	6.4	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	3268-87-9	OCDD	3.6	JB	0.12	100	pg/l	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	3268-87-9	OCDD	0.67	JB	0.035	13	pg/g	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.16	JB	0.032	6.4	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.80	JB	0.11	52	pg/l	J	bl,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	1.3	JB	0.097	52	pg/l	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.34	JB	0.023	6.4	pg/g	J	bl,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	39001-02-0	OCDF	0.87	JB	0.071	13	pg/g	J	bl,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	40321-76-4	1,2,3,7,8-PCDD	0.21	Jq	0.17	52	pg/l	J	k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.054	Jq	0.025	6.4	pg/g	J	k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.054	Jq	0.023	6.4	pg/g	J	k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.14	Jq	0.051	6.4	pg/g	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	30402-14-3	TCDF (total)	0.18	Jq	0.11	10	pg/l	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	34465-46-8	HxCDD (total)	1.9	JqB	0.11	52	pg/l	J	k,sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.10	Jq	0.040	1.3	pg/g	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	55684-94-1	HxCDF (total)	2.4	JqB	0.11	52	pg/l	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	57117-44-9	1,2,3,6,7,8-HxCDF	0.50	Jq	0.098	52	pg/l	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	60851-34-5	2,3,4,6,7,8-HxCDF	0.55	Jq	0.11	52	pg/l	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	36088-22-9	PeCDD (total)	0.21	Jq	0.17	52	pg/l	J	k,sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	39227-28-6	1,2,3,4,7,8-HxCDD	0.47	J	0.12	52	pg/l	J	sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.85	J	0.14	52	pg/l	J	sp
440-182697-2	RI-18-20.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.11	J	0.052	6.4	pg/g	J	sp
440-182697-2	RI-18-10.0-20170420-EB	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.76	J	0.10	52	pg/l	J	sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.21	JqB	0.033	7.6	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	0.98	JqB	0.030	7.6	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.35	JqB	0.040	7.6	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.14	JqB	0.040	7.6	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	3268-87-9	OCDD	0.74	JB	0.048	15	pg/g	J	bl,sp

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	39001-02-0	OCDF	1.7	JB	0.068	15	pg/g	J	bl,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.57	JB	0.027	7.6	pg/g	J	bl,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.12	Jq	0.047	7.6	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.22	Jq	0.079	7.6	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.12	Jq	0.080	7.6	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.52	JqB	0.077	7.6	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.12	Jq	0.046	7.6	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	30402-15-4	PeCDF (total)	0.17	J	0.061	7.6	pg/g	J	sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	0.17	J	0.060	7.6	pg/g	J	sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	51207-31-9	2,3,7,8-TCDF	0.12	J	0.054	1.5	pg/g	J	sp
440-182697-2	RI-18-30.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.12	J	0.054	1.5	pg/g	J	sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.23	JqB	0.028	7.7	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.079	JqB	0.034	7.7	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	55684-94-1	HxCDF (total)	0.068	JqB	0.047	7.7	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	38998-75-3	HpCDF (total)	0.57	JqB	0.031	7.7	pg/g	J	bl,k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	37871-00-4	HpCDD (total)	0.72	JB	0.045	7.7	pg/g	J	bl,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.41	JB	0.045	7.7	pg/g	J	bl,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	39001-02-0	OCDF	2.1	JB	0.086	15	pg/g	J	bl,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.068	Jq	0.048	7.7	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	30402-14-3	TCDF (total)	0.083	Jq	0.042	1.5	pg/g	J	k,sp
440-182697-2	RI-18-30.0-20170420-FD	4/20/2017	8290	3268-87-9	OCDD	13	JB	0.084	15	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	3268-87-9	OCDD	1.4	JB	0.035	11	pg/g	J	bl,sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.32	JB	0.036	5.4	pg/g	J	bl,sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.58	JB	0.036	5.4	pg/g	J	bl,sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	11	q	0.070	1.1	pg/g	J	k
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	3.9	JqB	0.056	5.4	pg/g	J	k,sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.62	Jq	0.029	5.4	pg/g	J	k,sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	2.2	J	0.092	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	60851-34-5	2,3,4,6,7,8-HxCDF	0.16	J	0.056	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.27	J	0.030	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.27	J	0.026	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	1.6	JB	0.024	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.18	J	0.058	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	57117-31-4	2,3,4,7,8-PCDF	1.1	J	0.094	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	1.3	J	0.057	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	57117-44-9	1,2,3,6,7,8-HxCDF	0.63	JB	0.053	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	3.3	JB	0.026	5.4	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	39001-02-0	OCDF	9.7	JB	0.052	11	pg/g	J	sp
440-182699-2	RI-19-5.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.68	JB	0.029	5.4	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	3268-87-9	OCDD	3.5	JB	0.032	8.4	pg/g	J	bl,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	1.0	JB	0.040	4.2	pg/g	J	bl,sp

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	2.3	JB	0.040	4.2	pg/g	J	bl,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	22	q	0.11	0.84	pg/g	J	k
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	30402-15-4	PeCDF (total)	17	q	0.073	4.2	pg/g	J	k
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	1746-01-6	2,3,7,8-TCDD	0.13	Jq	0.036	0.84	pg/g	J	k,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	36088-22-9	PeCDD (total)	0.95	Jq	0.049	4.2	pg/g	J	k,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	1.5	Jq	0.028	4.2	pg/g	J	k,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.32	Jq	0.025	4.2	pg/g	J	k,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	41903-57-5	TCDD (total)	0.70	Jq	0.036	0.84	pg/g	J	k,sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	3.3	J	0.072	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	2.7	JB	0.043	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	57117-44-9	1,2,3,6,7,8-HxCDF	2.1	JB	0.11	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	3.8	J	0.12	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	60851-34-5	2,3,4,6,7,8-HxCDF	0.46	J	0.11	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.34	J	0.12	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	39227-28-6	1,2,3,4,7,8-HxCDD	0.13	J	0.030	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.29	J	0.028	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	40321-76-4	1,2,3,7,8-PCDD	0.21	J	0.049	4.2	pg/g	J	sp
440-182699-2	RI-19-10.0-20170420	4/20/2017	8290	57117-31-4	2,3,4,7,8-PCDF	2.2	J	0.074	4.2	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.31	JqB	0.035	6.0	pg/g	J	bl,k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.20	JB	0.028	6.0	pg/g	J	bl,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.49	JB	0.023	6.0	pg/g	J	bl,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.15	JB	0.035	6.0	pg/g	J	bl,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	0.94	JB	0.026	6.0	pg/g	J	bl,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	3268-87-9	OCDD	0.62	JB	0.035	12	pg/g	J	bl,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	30402-15-4	PeCDF (total)	0.43	Jq	0.043	6.0	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	41903-57-5	TCDD (total)	0.19	Jq	0.048	1.2	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	57117-44-9	1,2,3,6,7,8-HxCDF	0.13	JqB	0.040	6.0	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.61	JqB	0.042	6.0	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	0.17	Jq	0.043	6.0	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.18	Jq	0.043	6.0	pg/g	J	k,sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	51207-31-9	2,3,7,8-TCDF	0.27	J	0.039	1.2	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.15	J	0.028	6.0	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.12	J	0.025	6.0	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.27	J	0.028	6.0	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	72918-21-9	1,2,3,7,8,9-HxCDF	0.16	J	0.044	6.0	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.74	J	0.039	1.2	pg/g	J	sp
440-182699-2	RI-19-20.0-20170420	4/20/2017	8290	39001-02-0	OCDF	2.7	JB	0.059	12	pg/g	J	sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	0.57	JqB	0.034	8.0	pg/g	J	bl,k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	38998-75-3	HpCDF (total)	1.3	JqB	0.038	8.0	pg/g	J	bl,k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	0.27	JqB	0.038	8.0	pg/g	J	bl,k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	37871-00-4	HpCDD (total)	0.59	JqB	0.038	8.0	pg/g	J	bl,k,sp

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	3268-87-9	OCDD	2.2	JB	0.049	16	pg/g	J	bl,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	55684-94-1	HxCDF (total)	0.27	JB	0.095	8.0	pg/g	J	bl,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	0.25	JB	0.042	8.0	pg/g	J	bl,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	39001-02-0	OCDF	2.0	JB	0.072	16	pg/g	J	bl,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	30402-14-3	TCDF (total)	0.62	Jq	0.042	1.6	pg/g	J	k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	57117-41-6	1,2,3,7,8-PCDF	0.12	Jq	0.056	8.0	pg/g	J	k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	30402-15-4	PeCDF (total)	0.43	Jq	0.057	8.0	pg/g	J	k,sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	34465-46-8	HxCDD (total)	0.17	J	0.033	8.0	pg/g	J	sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	70648-26-9	1,2,3,4,7,8-HxCDF	0.27	J	0.097	8.0	pg/g	J	sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	19408-74-3	1,2,3,7,8,9-HxCDD	0.073	J	0.030	8.0	pg/g	J	sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	51207-31-9	2,3,7,8-TCDF	0.19	J	0.042	1.6	pg/g	J	sp
440-182699-2	RI-19-30.0-20170420	4/20/2017	8290	57653-85-7	1,2,3,6,7,8-HxCDD	0.092	J	0.034	8.0	pg/g	J	sp
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	17	F2	5.4	5.4	mg/kg	J	ld
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		UF1F2	2.7	11	mg/kg	UJ	m,ld
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7440-24-6	Strontium	320		2.7	5.4	mg/kg	J	sd
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	1100		2.7	5.4	mg/kg	J	sd
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7440-39-3	Barium	220		0.81	1.6	mg/kg	J	sd
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	12000		5.4	11	mg/kg	J	sd
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7439-89-6	Iron	22000	B	5.4	11	mg/kg	J	sd
440-182697-1	RI-18-5.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	70		0.54	1.1	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	15		5.6	5.6	mg/kg	J	ld
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	2.8	11	mg/kg	UJ	m,ld
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7440-24-6	Strontium	310		2.8	5.6	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	16000		5.6	11	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	830		2.8	5.6	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7440-39-3	Barium	210		0.84	1.7	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	63		0.56	1.1	mg/kg	J	sd
440-182697-1	RI-18-10.0-20170420	4/20/2017	6010	7439-89-6	Iron	20000	B	5.6	11	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	36		6.5	6.5	mg/kg	J	ld
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	3.2	13	mg/kg	UJ	m,ld
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7440-39-3	Barium	53		0.97	1.9	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	56		0.65	1.3	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	26000		6.5	13	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	530		3.2	6.5	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7440-24-6	Strontium	1800		3.2	6.5	mg/kg	J	sd
440-182697-1	RI-18-20.0-20170420	4/20/2017	6010	7439-89-6	Iron	13000	B	6.5	13	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	52		7.6	7.6	mg/kg	J	ld
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	3.8	15	mg/kg	UJ	m,ld
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7439-89-6	Iron	21000	B	7.6	15	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	850		3.8	7.6	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	52		0.76	1.5	mg/kg	J	sd

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	46000		7.6	15	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7440-24-6	Strontium	150		3.8	7.6	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7440-39-3	Barium	71		1.1	2.3	mg/kg	J	sd,fd
440-182697-1	RI-18-30.0-20170420	4/20/2017	6010	7439-98-7	Molybdenum	1.5	J	1.5	3.0	mg/kg	J	sp
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7440-67-7	Zirconium	42		7.7	7.7	mg/kg	J	ld
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7440-33-7	Tungsten		U	3.8	15	mg/kg	UJ	m,ld
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7723-14-0	Phosphorus (total)	830		3.8	7.7	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7440-24-6	Strontium	160		3.8	7.7	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7440-62-2	Vanadium	53		0.77	1.5	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7439-89-6	Iron	19000	B	7.7	15	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7439-95-4	Magnesium	37000		7.7	15	mg/kg	J	sd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	6010	7440-39-3	Barium	1700		1.2	2.3	mg/kg	J	sd,fd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	8.8		5.5	5.5	mg/kg	J	ld
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	2.7	11	mg/kg	R	m
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7440-39-3	Barium	250		0.82	1.6	mg/kg	J	sd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7440-24-6	Strontium	340		2.7	5.5	mg/kg	J	sd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	72		0.55	1.1	mg/kg	J	sd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	820		2.7	5.5	mg/kg	J	sd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7439-89-6	Iron	23000	B	5.5	11	mg/kg	J	sd
440-182699-1	RI-19-5.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	12000		5.5	11	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7440-67-7	Zirconium		U	5.4	5.4	mg/kg	UJ	ld
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	2.7	11	mg/kg	R	m
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	12000		5.4	11	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	70		0.54	1.1	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7439-89-6	Iron	22000	B	5.4	11	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7440-39-3	Barium	110		0.81	1.6	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	770		2.7	5.4	mg/kg	J	sd
440-182699-1	RI-19-10.0-20170420	4/20/2017	6010	7440-24-6	Strontium	230		2.7	5.4	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	31		6.0	6.0	mg/kg	J	ld
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	3.0	12	mg/kg	R	m
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	430		3.0	6.0	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	13000		6.0	12	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	58		0.60	1.2	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7440-39-3	Barium	68		0.91	1.8	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7440-24-6	Strontium	280		3.0	6.0	mg/kg	J	sd
440-182699-1	RI-19-20.0-20170420	4/20/2017	6010	7439-89-6	Iron	14000	B	6.0	12	mg/kg	J	sd
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7440-67-7	Zirconium	40		8.0	8.0	mg/kg	J	ld
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7440-33-7	Tungsten		U	4.0	16	mg/kg	R	m
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7440-62-2	Vanadium	57		0.80	1.6	mg/kg	J	sd
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7723-14-0	Phosphorus (total)	680		4.0	8.0	mg/kg	J	sd
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7440-24-6	Strontium	150		4.0	8.0	mg/kg	J	sd

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7440-39-3	Barium	64		1.2	2.4	mg/kg	J	sd
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7439-95-4	Magnesium	50000		8.0	16	mg/kg	J	sd
440-182699-1	RI-19-30.0-20170420	4/20/2017	6010	7439-89-6	Iron	20000	B	8.0	16	mg/kg	J	sd
440-182699-3	RI-19-5.0-20170420	4/20/2017	6020	7440-36-0	Antimony		U	0.52	1.3	mg/kg	UJ	m
440-182699-3	RI-19-5.0-20170420	4/20/2017	6020	7440-03-1	Nb		U^	3.1	6.4	mg/kg	R	m
440-182699-3	RI-19-10.0-20170420	4/20/2017	6020	7440-36-0	Antimony		U	0.53	1.3	mg/kg	UJ	m
440-182699-3	RI-19-10.0-20170420	4/20/2017	6020	7440-03-1	Nb		U^	3.2	6.6	mg/kg	R	m
440-182699-3	RI-19-20.0-20170420	4/20/2017	6020	7440-03-1	Nb		U^	3.1	6.5	mg/kg	R	m
440-182699-3	RI-19-20.0-20170420	4/20/2017	6020	7440-36-0	Antimony		U	0.52	1.3	mg/kg	UJ	m
440-182699-3	RI-19-30.0-20170420	4/20/2017	6020	7440-36-0	Antimony		U	0.79	2.0	mg/kg	UJ	m
440-182699-3	RI-19-30.0-20170420	4/20/2017	6020	7440-03-1	Nb		U^	4.7	9.8	mg/kg	R	m
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	7471	7439-97-6	Mercury	0.020	J	0.019	0.031	mg/kg	J	sp
440-182699-1	RI-19-30.0-20170420	4/20/2017	7471	7439-97-6	Mercury	0.032		0.019	0.032	mg/kg	J+	c
440-182697-1	RI-18-10.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	1.2	J	1.2	1.7	mg/kg	J	sp
440-182697-1	RI-18-10.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	5.4	J	3.9	5.5	mg/kg	J	sp
440-182697-1	RI-18-30.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	110		5.3	7.6	mg/kg	J	fd
440-182697-1	RI-18-30.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	24		1.7	2.3	mg/kg	J	fd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	3.0		1.7	2.3	mg/kg	J	fd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	13		5.4	7.7	mg/kg	J	fd
440-182697-1	RI-18-40.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	5.4	J	5.2	7.4	mg/kg	J	sp
440-182697-1	RI-18-60.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	2.0	J	1.7	2.3	mg/kg	J	sp
440-182699-1	RI-19-5.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		UF1	1.2	1.6	mg/kg	UJ	m
440-182699-1	RI-19-5.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	24		1.2	1.6	mg/kg	J	m
440-182699-1	RI-19-5.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	110	F1	3.8	5.4	mg/kg	J+	m
440-182699-1	RI-19-10.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.2	1.6	mg/kg	UJ	m
440-182699-1	RI-19-10.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	3.2		1.2	1.6	mg/kg	J	m
440-182699-1	RI-19-10.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	14		3.8	5.4	mg/kg	J+	m
440-182699-1	RI-19-20.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	60		4.3	6.1	mg/kg	J+	m
440-182699-1	RI-19-20.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.3	1.8	mg/kg	UJ	m
440-182699-1	RI-19-20.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	14		1.3	1.8	mg/kg	J	m
440-182699-1	RI-19-30.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.8	2.4	mg/kg	UJ	m
440-182699-1	RI-19-30.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	19		5.6	8.0	mg/kg	J+	m
440-182699-1	RI-19-30.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	4.3		1.8	2.4	mg/kg	J	m
440-182699-1	RI-19-40.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.7	2.3	mg/kg	UJ	m
440-182699-1	RI-19-40.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	9.4		5.3	7.5	mg/kg	J+	m
440-182699-1	RI-19-40.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	2.1	J	1.7	2.3	mg/kg	J	m,sp
440-182699-1	RI-19-50.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	9.5		5.2	7.4	mg/kg	J+	m
440-182699-1	RI-19-50.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.6	2.2	mg/kg	UJ	m
440-182699-1	RI-19-50.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	2.1	J	1.6	2.2	mg/kg	J	m,sp
440-182699-1	RI-19-50.0-20170420-FD	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	8.1		4.9	7.1	mg/kg	J+	m
440-182699-1	RI-19-50.0-20170420-FD	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.6	2.1	mg/kg	UJ	m

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182699-1	RI-19-50.0-20170420-FD	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	1.8	J	1.6	2.1	mg/kg	J	m,sp
440-182699-1	RI-19-60.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	9.3		5.5	7.9	mg/kg	J+	m
440-182699-1	RI-19-60.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.7	2.4	mg/kg	UJ	m
440-182699-1	RI-19-60.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	2.1	J	1.7	2.4	mg/kg	J	m,sp
440-182699-1	RI-19-70.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.5	2.1	mg/kg	UJ	m
440-182699-1	RI-19-80.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	1.5	2.1	mg/kg	UJ	m
440-182699-1	RI-19-80.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	7.3		4.8	6.9	mg/kg	J+	m
440-182699-1	RI-19-80.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	1.6	J	1.5	2.1	mg/kg	J	m,sp
440-182777-1	RI-19-90.0-20170420	4/20/2017	300.0	14797-65-0	Nitrite as N		U	2.0	2.7	mg/kg	UJ	h
440-182777-1	RI-19-90.0-20170420	4/20/2017	300.0	NO3/NO2-N	Nitrate Nitrite as N	2.0	J	2.0	2.7	mg/kg	J-	h,sp
440-182777-1	RI-19-90.0-20170420	4/20/2017	300.0	14797-55-8_NO3	Nitrate as NO3	8.8	J	6.2	8.9	mg/kg	J-	h,sp
440-182777-1	RI-19-100.0-20170421	4/21/2017	300.0	14797-55-8_NO3	Nitrate as NO3	6.0	J	5.8	8.2	mg/kg	J	sp
440-182777-1	RI-19-110.0-20170421	4/21/2017	300.0	14797-55-8_NO3	Nitrate as NO3	6.1	J	6.1	8.7	mg/kg	J	sp
440-182697-1	RI-18-80.0-20170420	4/20/2017	300.1	14866-68-3	Chlorate	0.17	J	0.086	0.34	mg/kg	J	sp
440-182697-1	RI-18-90.0-20170420	4/20/2017	300.1	14866-68-3	Chlorate	0.18	J	0.086	0.34	mg/kg	J	sp
440-182777-1	RI-19-150.0-20170421	4/21/2017	300.1	14866-68-3	Chlorate	0.25	J	0.079	0.32	mg/kg	J	sp
440-182697-1	RI-18-30.0-20170420	4/20/2017	314.0	14797-73-0	Perchlorate	1.7		0.072	0.076	mg/kg	J	fd
440-182697-1	RI-18-30.0-20170420-FD	4/20/2017	314.0	14797-73-0	Perchlorate	0.31		0.015	0.016	mg/kg	J	fd
440-182699-1	RI-19-80.0-20170420	4/20/2017	314.0	14797-73-0	Perchlorate	0.089		0.013	0.014	mg/kg	J	m,ld
440-182777-1	RI-19-90.0-20170420	4/20/2017	314.0	14797-73-0	Perchlorate	0.060		0.017	0.018	mg/kg	J	m,ld
440-182777-1	RI-19-95.0-20170420	4/20/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m,ld
440-182777-1	RI-19-100.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate	0.031		0.016	0.016	mg/kg	J	m,ld
440-182777-1	RI-19-105.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate	0.015	J	0.015	0.016	mg/kg	J	m,ld,sp
440-182777-1	RI-19-110.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		UF2F1	0.017	0.017	mg/kg	UJ	m,ld
440-182777-1	RI-19-115.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m,ld
440-182777-1	RI-19-120.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.016	0.017	mg/kg	UJ	m,ld
440-182777-1	RI-19-125.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m,ld
440-182777-1	RI-19-130.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m,ld
440-182777-1	RI-19-135.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.016	0.017	mg/kg	UJ	m,ld
440-182777-1	RI-19-140.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m,ld
440-182777-1	RI-19-145.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.013	0.013	mg/kg	UJ	m,ld
440-182777-1	RI-19-150.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m,ld
440-182779-1	RI-18-95.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		UF1	0.016	0.017	mg/kg	UJ	m
440-182779-1	RI-18-100.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m
440-182779-1	RI-18-105.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m
440-182779-1	RI-18-110.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m
440-182779-1	RI-18-115.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m
440-182779-1	RI-18-120.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.014	0.015	mg/kg	UJ	m
440-182779-1	RI-18-125.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m
440-182779-1	RI-18-125.0-20170421-FD	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.016	0.017	mg/kg	UJ	m
440-182779-1	RI-18-130.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.015	0.016	mg/kg	UJ	m

Table V. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code
440-182779-1	RI-18-135.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.018	0.018	mg/kg	UJ	m
440-182779-1	RI-18-140.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.017	0.018	mg/kg	UJ	m
440-182779-1	RI-18-145.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.017	0.018	mg/kg	UJ	m
440-182779-1	RI-18-150.0-20170421	4/21/2017	314.0	14797-73-0	Perchlorate		U	0.016	0.017	mg/kg	UJ	m
440-182697-1	RI-18-10.0-20170420-EB	4/20/2017	7199	18540-29-9	Chromium VI	0.28	J	0.25	2.0	ug/l	J	sp

ATTACHMENT A

VOC Data Validation Report

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

Instrument performance check data were not reviewed for Stage 2A validation.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182699-1	03/23/17 (JFC22058.D)	Dichlorodifluoromethane	20.6	RI-19-5.0-20170420-TB RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-70.0-20170420 RI-19-80.0-20170420	UJ (all non-detects)	A

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182777-1	03/23/17 (JFC22058.D)	Dichlorodifluoromethane	20.6	RI-19-90.0-20170420-TB RI-19-90.0-20170420 RI-19-95.0-20170420	UJ (all non-detects)	A

Initial calibration data were not reviewed for Stage 2A validation.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182697-1	04/26/17 (TFD26002.D)	Trichlorofluoromethane	23.5	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD RI-18-40.0-20170420 RI-18-50.0-20170420 RI-18-60.0-20170420 RI-18-90.0-20170420	NA	-
440-182697-1	04/26/17 (XFD26002.D)	2,2-Dichloropropane n-Butylbenzene	27.6 21.3	RI-18-70.0-20170420 RI-18-80.0-20170420	NA	-
440-182699-1	04/25/17 (JFD25002.D)	Dichlorodifluoromethane	29.8	RI-19-5.0-20170420-TB RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-70.0-20170420 RI-19-80.0-20170420	UJ (all non-detects)	A
440-182777-1	04/26/17 (TFD26002.D)	Trichlorofluoromethane	23.5	RI-19-150.0-20170421	NA	-

All of the continuing calibration relative response factors (RRF) were within validation criteria.

Continuing calibration data were not reviewed for Stage 2A validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples RI-18-10.0-20170420-EBTB* (from SDG 440-182697-1), RI-19-5.0-20170420-TB (from SDG 440-182699-1), and RI-19-90.0-20170420-TB (from SDG 440-182777-1) were identified as trip blanks. No contaminants were found.

Samples RI-18-10.0-20170420-EB* (from SDG 440-182697-1) and RI-19-60.0-20170420-EB* (from SDG 440-182699-1) were identified as equipment blanks. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1), samples RI-19-50.0-20170420 and RI-19-50.0-20170420-FD (both from SDG 440-182699-1), and samples RI-18-125.0-20170421 and RI-18-125.0-20170421-FD (both from SDG 440-182779-1) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-1	Chloroform	0.067	0.067	0 (≤50)	-	-

SDG	Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-19-50.0-20170420	RI-19-50.0-20170420-FD			
440-182699-1	Chloroform	0.046	0.032	36 (≤50)	-	-
	Trichloroethene	0.0055	0.0040	32 (≤50)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

Due to ICV %D and continuing calibration %D, data were qualified as estimated in fourteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Volatiles - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

SDG	Sample	Compound	Flag	A or P	Reason (Code)
440-182699-1	RI-19-5.0-20170420-TB RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-70.0-20170420 RI-19-80.0-20170420	Dichlorodifluoromethane	UJ (all non-detects)	A	Initial calibration verification (%D) (c)
440-182777-1	RI-19-90.0-20170420-TB RI-19-90.0-20170420 RI-19-95.0-20170420	Dichlorodifluoromethane	UJ (all non-detects)	A	Initial calibration verification (%D) (c)
440-182699-1	RI-19-5.0-20170420-TB RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-70.0-20170420 RI-19-80.0-20170420	Dichlorodifluoromethane	UJ (all non-detects)	A	Continuing calibration (%D) (c)

NERT RI Phase 2, April 2017, Parcel F HRA
Volatiles - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Volatiles - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

ATTACHMENT B

1,2,3-Trichloropropane & 1,4-Dioxane Data Validation Report

1,2,3-Trichloropropane and 1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8260B in Selected Ion Monitoring (SIM) mode

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Stage 2A validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Stage 2A validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Stage 2A validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample RI-18-10.0-20170420-EBTB (from SDG 440-182697-1) was identified as a trip blank. No contaminants were found.

Samples RI-18-10.0-20170420-EB (from SDG 440-182697-1) and RI-19-60.0-20170420-EB (from SDG 440-182699-1) were identified as equipment blanks. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

SDG	Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
440-182697-1	RI-18-10.0-20170420-EB	Dibromofluoromethane	121 (80-120)	All compounds	NA	-

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in these SDGs, and therefore matrix spike and matrix spike duplicate analyses were not performed for these SDGs.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in these SDGs.

XI. Internal Standards

Internal standard data were not reviewed for Stage 2A validation.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2A validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2A validation.

XIV. System Performance

Raw data were not reviewed for Stage 2A validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
1,2,3-Trichloropropane and 1,4-Dioxane - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
1,2,3-Trichloropropane and 1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
1,2,3-Trichloropropane and 1,4-Dioxane - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

ATTACHMENT C

SVOC Data Validation Report

Semivolatile Organic Compounds (SVOCs) by Environmental Protection Agency (EPA) SW 846 Method 8270C

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

SDG	Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
440-182697-1	RI-18-10.0-20170420-EBRE*	All compounds	9	7	UJ (all non-detects)	A

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

Instrument performance check data were not reviewed for Stage 2A validation.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182697-1	03/07/17 (ICV0307.D)	Hexachlorocyclopentadiene Benzidine	27.4 25.1	All soil samples in SDG 440-182697-1	UJ (all non-detects) UJ (all non-detects)	A

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182699-1	01/03/17 (ICV0103.D)	Benzidine	24.3	RI-19-5.0-20170420**	UJ (all non-detects)	A
440-182699-1	03/07/17 (ICV0307.D)	Hexachlorocyclopentadiene Benzidine	27.4 25.1	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	UJ (all non-detects) UJ (all non-detects)	A

Initial calibration data were not reviewed for Stage 2A validation.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
440-182697-1	04/26/17 (CCVIS426.D)	4-Nitrophenol	28.3	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	NA	-
440-182697-1	04/26/17 (CCVIS426.D)	Benzidine	21.7	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	UJ (all non-detects)	A
440-182697-1	04/26/17 (C0426001.D)	Octachlorostyrene	54.3	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	NA	-
440-182699-1	04/26/17 (CCVI5426.D)	4-Nitrophenol	28.3	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	NA	-
440-182699-1	04/26/17 (CCVI5426.D)	Benzidine	21.7	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	UJ (all non-detects)	A
440-182699-1	04/26/17 (C0426001.D)	Octachlorostyrene	54.3	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	NA	-

All of the continuing calibration relative response factors (RRF) were within validation criteria.

Continuing calibration data were not reviewed for Stage 2A validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples RI-18-10.0-20170420-EB* and RI-18-10.0-20170420-EBRE* (both from SDG 440-182697-1) were identified as equipment blanks. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for sample RI-18-10.0-20170420-EB* (from SDG 440-182697-1). Using professional judgment, no data were qualified when one base or one acid surrogate %R was outside the QC limits and the %R was greater than or equal to 10%.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

SDG	LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
440-182697-1	LCS/D 440-401986/2,3-A (RI-18-10.0-20170420-EB*)	Benzidine	0 (5-65)	0 (5-65)	R (all non-detects)	P
440-182697-1	LCS/D 440-403241/2,3-A (RI-18-10.0-20170420-EBRE*)	3,3'-Dichlorobenzidine	5 (10-106)	-	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

SDG	LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
440-182697-1	LCS/D 440-403241/2,3-A (RI-18-10.0-20170420-EBRE*)	Aniline 3,3'-Dichlorobenzidine 4-Chloroaniline	39 (≤35) 176 (≤35) 119 (≤35)	NA	-

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1) were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

SDG	Sample	Compound	Flag	A or P
440-182697-1	RI-18-10.0-20170420-EBRE*	All compounds	DNR	-

Due to LCS/LCSD %R, data were rejected in one sample.

Due to ICV and continuing calibration %D, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Semivolatiles - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

SDG	Sample	Compound	Flag	A or P	Reason (Code)
440-182697-1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Hexachlorocyclopentadiene Benzidine	UJ (all non-detects) UJ (all non-detects)	A	Initial calibration verification (%D) (c)
440-182699-1	RI-19-5.0-20170420**	Benzidine	UJ (all non-detects)	A	Initial calibration verification (%D) (c)
440-182699-1	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Hexachlorocyclopentadiene Benzidine	UJ (all non-detects) UJ (all non-detects)	A	Initial calibration verification (%D) (c)
440-182697-1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Benzidine	UJ (all non-detects)	A	Continuing calibration (%D) (c)
440-182699-1	RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Benzidine	UJ (all non-detects)	A	Continuing calibration (%D) (c)
440-182697-1	RI-18-10.0-20170420-EB*	Benzidine	R (all non-detects)	P	Laboratory control samples (%R) (l)
440-182697-1	RI-18-10.0-20170420-EBRE*	All compounds	DNR	-	Overall assessment of data (o)

NERT RI Phase 2, April 2017, Parcel F HRA
Semivolatiles - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Semivolatiles - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

ATTACHMENT D

PAHs Data Validation Report

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270C in Selected Ion Monitoring (SIM) mode

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was not required.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

Initial calibration data were not reviewed for Stage 2A validation.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

Continuing calibration data were not reviewed for Stage 2A validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-1) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

ATTACHMENT E

Chlorinated Pesticides Data Validation Report

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

Instrument performance check data were not reviewed for Stage 2A validation.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

Initial calibration data were not reviewed for Stage 2A validation.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

SDG	Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
440-182697-1	05/03/17	E03_005.D	Not specified	4,4'-DDT Methoxychlor	27.0 30.4	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	NA	-
440-182697-1	05/03/17	E03_014.D	Not specified	Methoxychlor	21.1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	NA	-
440-182699-1	04/25/17	D24_028	CLP 1	gamma-BHC Aldrin Endrin ketone	23.8 31.7 28.4	RI-19-5.0-20170420** RI-19-30.0-20170420	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
440-182699-1	05/03/17	E03_014	CLP 1	gamma-BHC Aldrin	32.6 43.3	RI-19-10.0-20170420 RI-19-20.0-20170420	UJ (all non-detects) UJ (all non-detects)	A
440-182699-1	05/03/17	E03_014	CLP 1	4,4'-DDT Methoxychlor Endosulfan sulfate	28.0 52.9 59.7	RI-19-10.0-20170420 RI-19-20.0-20170420	NA	-
440-182699-1	05/03/17	E03_014	CLP 2	Methoxychlor	21.1	RI-19-10.0-20170420 RI-19-20.0-20170420	NA	-

Retention times in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

Continuing calibration data were not reviewed for Stage 2A validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-1) was identified as an equipment blank. No contaminants were found.

VII. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

SDG	Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
440-182699-1	RI-19-10.0-20170420	Decachlorobiphenyl Tetrachloro-m-xylene	34 (45-120) 30 (35-115)	All compounds	UJ (all non-detects)	A
440-182699-1	RI-19-20.0-20170420	Decachlorobiphenyl	37 (45-120)	All compounds	UJ (all non-detects)	A

All internal standard areas and retention times were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in these SDGs, and therefore matrix spike and matrix spike duplicate analyses were not performed for these SDGs.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1) were identified as field duplicates. No results were detected in any of the samples.

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XII. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

Due to continuing calibration %D and surrogate %R, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Chlorinated Pesticides - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

SDG	Sample	Compound	Flag	A or P	Reason (Code)
440-182699-1	RI-19-5.0-20170420** RI-19-30.0-20170420	gamma-BHC Aldrin Endrin ketone	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (c)
440-182699-1	RI-19-10.0-20170420 RI-19-20.0-20170420	gamma-BHC Aldrin	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (c)
440-182699-1	RI-19-10.0-20170420 RI-19-20.0-20170420	All compounds	UJ (all non-detects)	A	Surrogate spikes (%R) (s)

NERT RI Phase 2, April 2017, Parcel F HRA
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

ATTACHMENT F

Aroclor-1260 Data Validation Report

Aroclor-1260 by Environmental Protection Agency (EPA) SW 846 Method 8082

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

Initial calibration data were not reviewed for Stage 2A validation.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

Retention times in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

Continuing calibration data were not reviewed for Stage 2A validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-1) was identified as an equipment blank. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1) were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XI. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Aroclor-1260 - Data Qualification Summary – SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Aroclor-1260 – Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Aroclor-1260 - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1

No Sample Data Qualified in these SDGs

ATTACHMENT G

PCDD/PCDF Data Validation Report

Polychlorinated Dioxins/Dibenzofurans (PCDD/PCDF) by Environmental Protection Agency (EPA) SW 846 Method 8290

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues.

The chromatographic resolution between 2,3,7,8-TCDD and the peaks representing any other unlabeled TCDD isomers was resolved with a valley of less than or equal to 25%.

The exact mass of 380.9760 of PFK was verified. The static resolving power was at least 10,000 (10% valley definition) for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio for each target compound was greater than or equal to 2.5 and greater than or equal to 10 for each recovery and internal standard compound for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

SDG	Laboratory Blank ID	Extraction Date	Compound	Concentration	Associated Samples
440-182697-2	MB 320-161157/1-A	04/25/17	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDF Total HpCDD Total HpCDF	0.0609 pg/g 0.270 pg/g 0.129 pg/g 0.0941 pg/g 1.64 pg/g 0.462 pg/g 0.0609 pg/g 0.506 pg/g 0.300 pg/g	All soil samples in SDG 440-182697-2
440-182697-2	MB 320-161829/1-A	04/28/17	1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF OCDD OCDF Total HxCDD Total HxCDF Total HpCDD Total HpCDF	0.232 pg/L 0.177 pg/L 0.301 pg/L 0.422 pg/L 0.350 pg/L 2.72 pg/L 0.820 pg/L 0.232 pg/L 0.478 pg/L 1.30 pg/L 0.350 pg/L	All water samples in SDG 440-182697-2
440-182699-2	MB 320-161157/1-A	04/25/17	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDF Total HpCDD Total HpCDF	0.0609 pg/g 0.270 pg/g 0.129 pg/g 0.0941 pg/g 1.64 pg/g 0.462 pg/g 0.0609 pg/g 0.506 pg/g 0.300 pg/g	All soil samples in SDG 440-182699-2

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

SDG	Sample	Compound	Reported Concentration	Modified Final Concentration
440-182697-2	RI-18-5.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HpCDD Total HpCDF	0.15 pg/g 0.32 pg/g 0.19 pg/g 0.72 pg/g 1.1 pg/g 0.15 pg/g 0.65 pg/g	0.15J pg/g 0.32J pg/g 0.19J pg/g 0.72J pg/g 1.1J pg/g 0.15J pg/g 0.65J pg/g

SDG	Sample	Compound	Reported Concentration	Modified Final Concentration
440-182697-2	RI-18-10.0-20170420	1,2,3,6,7,8-HxCDF	0.11 pg/g	0.11J pg/g
		1,2,3,4,6,7,8-HpCDD	0.32 pg/g	0.32J pg/g
		1,2,3,4,6,7,8-HpCDF	0.35 pg/g	0.35J pg/g
		1,2,3,4,7,8,9-HpCDF	0.23 pg/g	0.23J pg/g
		OCDD	1.9 pg/g	1.9J pg/g
		OCDF	1.3 pg/g	1.3J pg/g
		Total HpCDD	0.50 pg/g	0.50J pg/g
		Total HpCDF	0.75 pg/g	0.75J pg/g
440-182697-2	RI-18-20.0-20170420	1,2,3,4,6,7,8-HpCDD	0.16 pg/g	0.16J pg/g
		1,2,3,4,6,7,8-HpCDF	0.34 pg/g	0.34J pg/g
		1,2,3,4,7,8,9-HpCDF	0.12 pg/g	0.12J pg/g
		OCDD	0.67 pg/g	0.67J pg/g
		OCDF	0.87 pg/g	0.87J pg/g
		Total HxCDF	0.25 pg/g	0.25J pg/g
		Total HpCDD	0.32 pg/g	0.32J pg/g
		Total HpCDF	0.62 pg/g	0.62J pg/g
440-182697-2	RI-18-30.0-20170420	1,2,3,4,6,7,8-HpCDD	0.14 pg/g	0.14J pg/g
		1,2,3,4,6,7,8-HpCDF	0.57 pg/g	0.57J pg/g
		1,2,3,4,7,8,9-HpCDF	0.21 pg/g	0.21J pg/g
		OCDD	0.74 pg/g	0.74J pg/g
		OCDF	1.7 pg/g	1.7J pg/g
		Total HpCDD	0.35 pg/g	0.35J pg/g
		Total HpCDF	0.98 pg/g	0.98J pg/g
440-182697-2	RI-18-30.0-20170420-FD	1,2,3,4,6,7,8-HpCDD	0.41 pg/g	0.41J pg/g
		1,2,3,4,6,7,8-HpCDF	0.23 pg/g	0.23J pg/g
		1,2,3,4,7,8,9-HpCDF	0.079 pg/g	0.079J pg/g
		OCDF	2.1 pg/g	2.1J pg/g
		Total HxCDF	0.068 pg/g	0.068J pg/g
		Total HpCDD	0.72 pg/g	0.72J pg/g
		Total HpCDF	0.57 pg/g	0.57J pg/g
440-182697-2	RI-18-10.0-20170420-EB*	1,2,3,7,8,9-HxCDD	0.48 pg/L	0.48J pg/L
		1,2,3,4,7,8-HxCDF	0.55 pg/L	0.55J pg/L
		1,2,3,7,8,9-HxCDF	0.80 pg/L	0.80J pg/L
		1,2,3,4,6,7,8-HpCDD	1.3 pg/L	1.3J pg/L
		1,2,3,4,6,7,8-HpCDF	0.81 pg/L	0.81J pg/L
		OCDD	3.6 pg/L	3.6J pg/L
		OCDF	2.3 pg/L	2.3J pg/L
		Total HpCDD	2.0 pg/L	2.0J pg/L
		Total HpCDF	1.7 pg/L	1.7J pg/L
440-182699-2	RI-19-5.0-20170420**	1,2,3,4,6,7,8-HpCDD	0.32 pg/g	0.32J pg/g
		OCDD	1.4 pg/g	1.4J pg/g
		Total HpCDD	0.58 pg/g	0.58J pg/g
440-182699-2	RI-19-20.0-20170420	1,2,3,4,6,7,8-HpCDD	0.15 pg/g	0.15J pg/g
		1,2,3,4,6,7,8-HpCDF	0.49 pg/g	0.49J pg/g
		1,2,3,4,7,8,9-HpCDF	0.20 pg/g	0.20J pg/g
		OCDD	0.62 pg/g	0.62J pg/g
		Total HpCDD	0.31 pg/g	0.31J pg/g
		Total HpCDF	0.94 pg/g	0.94J pg/g

SDG	Sample	Compound	Reported Concentration	Modified Final Concentration
440-182699-2	RI-19-30.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDF Total HpCDD Total HpCDF	0.27 pg/g 0.57 pg/g 0.25 pg/g 2.2 pg/g 2.0 pg/g 0.27 pg/g 0.59 pg/g 1.3 pg/g	0.27J pg/g 0.57J pg/g 0.25J pg/g 2.2J pg/g 2.0J pg/g 0.27J pg/g 0.59J pg/g 1.3J pg/g
440-182699-2	RI-19-10.0-20170420	1,2,3,4,6,7,8-HpCDD OCDD Total HpCDD	1.0 pg/g 3.5 pg/g 2.3 pg/g	1.0J pg/g 3.5J pg/g 2.3J pg/g

VI. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-2) was identified as an equipment blank. No contaminants were found with the following exceptions:

SDG	Blank ID	Collection Date	Compound	Concentration	Associated Samples
440-182697-2	RI-18-10.0-20170420-EB*	04/20/17	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total TCDF Total PeCDD Total HxCDD Total HxCDF Total HpCDD Total HpCDF	0.21 pg/L 0.47 pg/L 0.76 pg/L 0.48 pg/L 0.55 pg/L 0.50 pg/L 0.55 pg/L 0.80 pg/L 1.3 pg/L 0.81 pg/L 0.85 pg/L 3.6 pg/L 2.3 pg/L 0.18 pg/L 0.21 pg/L 1.9 pg/L 2.4 pg/L 2.0 pg/L 1.7 pg/L	RI-18-10.0-20170420

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in these SDGs, and therefore matrix spike and matrix spike duplicate analyses were not performed for these SDGs.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (pg/g)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-2	2,3,7,8-TCDF	0.12	0.042U	200 (≤50)	NQ	-
	1,2,3,7,8-PeCDF	0.17	0.054U	200 (≤50)	NQ	-
	1,2,3,6,7,8-HxCDD	0.12	0.076U	200 (≤50)	NQ	-
	1,2,3,4,7,8-HxCDF	0.22	0.047U	200 (≤50)	NQ	-
	1,2,3,7,8,9-HxCDF	0.12	0.068	55 (≤50)	NQ	-
	1,2,3,4,6,7,8-HpCDD	0.14	0.41	98 (≤50)	NQ	-
	1,2,3,4,6,7,8-HpCDF	0.57	0.23	85 (≤50)	NQ	-
	1,2,3,4,7,8,9-HpCDF	0.21	0.079	91 (≤50)	NQ	-
	OCDD	0.74	13	178 (≤50)	NQ	-
	OCDF	1.7	2.1	21 (≤50)	-	-
	Total TCDF	0.12	0.083	36 (≤50)	-	-
	Total PeCDF	0.17	0.056U	200 (≤50)	NQ	-
	Total HxCDD	0.12	0.079U	200 (≤50)	NQ	-
	Total HxCDF	0.52	0.068	154 (≤50)	NQ	-
	Total HpCDD	0.35	0.72	69 (≤50)	NQ	-
	Total HpCDF	0.98	0.57	53 (≤50)	NQ	-

NQ = No data were qualified when either the primary or duplicate result was not detected, was below the practical quantitation limit (PQL) or was reported as estimated maximum possible concentration (EMPC).

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

Internal standard data were not reviewed for Stage 2A validation.

XI. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

SDG	Sample	Finding	Flag	A or P
440-182697-2	All samples in SDG 440-182697-2	Results were flagged “q” by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A
440-182699-2	All samples in SDG 440-182699-2	Results were flagged “q” by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the following exceptions:

SDG	Sample	Finding	Criteria	Flag
440-182697-2	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-30.0-20170420	2nd column confirmation was not performed for 2,3,7,8-TCDF when the detected result was less than the reporting limit or was reported as EMPC.	2,3,7,8-TCDF must be confirmed on a 2nd column per the method.	Using professional judgment, no data were qualified since the reported results were flagged by the laboratory as estimated.

No results were rejected in these SDGs.

Due to results reported as EMPC, data were qualified as estimated in ten samples.

Due to laboratory blank contamination, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDGs 440-182697-2, 440-182699-2

SDG	Sample	Compound	Flag	A or P	Reason (Code)
440-182697-2	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-10.0-20170420-EB* RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Results were flagged "q" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Compound quantitation (EMPC) (k)
440-182699-2	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Results were flagged "q" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Compound quantitation (EMPC) (k)

NERT RI Phase 2, April 2017, Parcel F HRA
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDGs 440-182697-2, 440-182699-2

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
440-182697-2	RI-18-5.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HpCDD Total HpCDF	0.15J pg/g 0.32J pg/g 0.19J pg/g 0.72J pg/g 1.1J pg/g 0.15J pg/g 0.65J pg/g	A	bl
440-182697-2	RI-18-10.0-20170420	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HpCDD Total HpCDF	0.11J pg/g 0.32J pg/g 0.35J pg/g 0.23J pg/g 1.9J pg/g 1.3J pg/g 0.50J pg/g 0.75J pg/g	A	bl
440-182697-2	RI-18-20.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDF Total HpCDD Total HpCDF	0.16J pg/g 0.34J pg/g 0.12J pg/g 0.67J pg/g 0.87J pg/g 0.25J pg/g 0.32J pg/g 0.62J pg/g	A	bl
440-182697-2	RI-18-30.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HpCDD Total HpCDF	0.14J pg/g 0.57J pg/g 0.21J pg/g 0.74J pg/g 1.7J pg/g 0.35J pg/g 0.98J pg/g	A	bl

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
440-182697-2	RI-18-30.0-20170420-FD	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF Total HxCDF Total HpCDD Total HpCDF	0.41J pg/g 0.23J pg/g 0.079J pg/g 2.1J pg/g 0.068J pg/g 0.72J pg/g 0.57J pg/g	A	bl
440-182697-2	RI-18-10.0-20170420-EB*	1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF OCDD OCDF Total HpCDD Total HpCDF	0.48J pg/L 0.55J pg/L 0.80J pg/L 1.3J pg/L 0.81J pg/L 3.6J pg/L 2.3J pg/L 2.0J pg/L 1.7J pg/L	A	bl
440-182699-2	RI-19-5.0-20170420**	1,2,3,4,6,7,8-HpCDD OCDD Total HpCDD	0.32J pg/g 1.4J pg/g 0.58J pg/g	A	bl
440-182699-2	RI-19-20.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD Total HpCDD Total HpCDF	0.15J pg/g 0.49J pg/g 0.20J pg/g 0.62J pg/g 0.31J pg/g 0.94J pg/g	A	bl
440-182699-2	RI-19-30.0-20170420	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDF Total HpCDD Total HpCDF	0.27J pg/g 0.57J pg/g 0.25J pg/g 2.2J pg/g 2.0J pg/g 0.27J pg/g 0.59J pg/g 1.3J pg/g	A	bl
440-182699-2	RI-19-10.0-20170420	1,2,3,4,6,7,8-HpCDD OCDD Total HpCDD	1.0J pg/g 3.5J pg/g 2.3J pg/g	A	bl

NERT RI Phase 2, April 2017, Parcel F HRA
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDGs 440-182697-2, 440-182699-2

No Sample Data Qualified in these SDGs

ATTACHMENT H

Metals Data Validation Report

Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Niobium, Phosphorus, Silver, Strontium, Thallium, Tungsten, Vanadium, and Zirconium by Environmental Protection Agency (EPA) SW 846 Methods 6010B/6020A
Mercury by EPA SW 846 Methods 7470A/7471A

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits with the following exceptions:

SDG	Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
440-182697-3	05/11/17	ICV (16:47)	Niobium	127 (90-110)	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	NA	-
440-182697-3	05/25/17	CCV (19:04)	Niobium	111 (90-110)	RI-18-10.0-20170420-EB*	NA	-
440-182699-3	05/25/17	CCV (18:07)	Niobium	113 (90-110)	All samples in SDG 440-182699-3	NA	-
440-182699-1	04/25/17	CRQL (16:56)	Mercury	132 (70-130)	RI-19-30.0-20170420	J+ (all detects)	P
440-182699-1	04/25/17	CRQL (16:56)	Mercury	132 (70-130)	RI-19-5.0-20170420** RI-19-20.0-20170420	NA	-

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

Instrument performance check data were not reviewed for Stage 2A validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

SDG	Blank ID	Analyte	Maximum Concentration	Associated Samples
440-182699-3	ICB/CCB	Antimony	1.29 ug/L	All samples in SDG 440-182699-3
440-182697-1	PB (prep blank)	Iron	12.3 mg/Kg	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD
440-182697-1	ICB/CCB	Silver	0.00733 mg/L	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD
440-182697-1	PB (prep blank)	Chromium	5.55 ug/L	RI-18-10.0-20170420-EB*
440-182699-1	PB (prep blank)	Iron	12.3 mg/Kg	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420
440-182699-1	ICB/CCB	Silver	0.00733 mg/L	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks.

V. Field Blanks

Samples RI-18-10.0-20170420-EB* (from SDG 440-182697-3), RI-18-10.0-20170420-EB* (from SDG 440-182697-1), and RI-19-60.0-20170420-EB* (from SDG 440-182699-1) were identified as equipment blanks. No contaminants were found with the following exceptions:

SDG	Blank ID	Collection Date	Analyte	Concentration	Associated Samples
440-182697-1	RI-18-10.0-20170420-EB*	04/20/17	Magnesium	59 ug/L	RI-18-10.0-20170420

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
440-182699-3	RI-8-20.0-20170422MS/MSD (All samples in SDG 440-182699-3)	Antimony	61 (75-125)	54 (75-125)	UJ (all non-detects)	A
440-182699-3	RI-8-20.0-20170422MS/MSD (All samples in SDG 440-182699-3)	Niobium	0 (75-125)	0 (75-125)	R (all non-detects)	A
440-182697-1	RI-18-5.0-20170420MS/MSD (RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD)	Tungsten	21 (75-125)	23 (75-125)	UJ (all non-detects)	A
440-182699-1	RI-18-5.0-20170420MS/MSD (RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420)	Tungsten	21 (75-125)	17 (75-125)	R (all non-detects)	A

For RI-18-5.0-20170420MS/MSD (from SDG 440-182697-1), although the percent recoveries were severely low for Tungsten, the associated sample results were qualified as estimated (UJ) since the post spike recoveries were within the QC limits for this analyte.

For RI-18-5.0-20170420MS/MSD (from SDG 440-182697-1), no data were qualified for Barium, Iron, Magnesium, Manganese, Phosphorus, and Strontium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
440-182697-1	RI-18-5.0-20170420MS/MSD (RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD)	Tungsten Zirconium	23 (≤20) 21 (≤20)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

SDG	Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
440-182699-1	RI-18-5.0-20170420MS/MSD (RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420)	Tungsten Zirconium	23 (≤20) 21 (≤20)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in these SDGs, and therefore duplicate analyses were not performed for these SDGs.

VIII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits with the following exceptions:

SDG	Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
440-182697-1	RI-18-5.0-20170420	Barium Iron Magnesium Phosphorus Strontium Vanadium	12 (≤10) 11 (≤10) 11 (≤10) 13 (≤10) 13 (≤10) 11 (≤10)	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
440-182699-1	RI-18-5.0-20170420	Barium Iron Magnesium Phosphorus Strontium Vanadium	12 (≤10) 11 (≤10) 11 (≤10) 13 (≤10) 13 (≤10) 11 (≤10)	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Standard Reference Material

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference material (SRM) samples were performed at the required frequency. Percent recoveries (%R) of were within QC limits.

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-3), samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1), and samples RI-19-50.0-20170420** and RI-19-50.0-20170420-FD** (both from SDG 440-182699-1) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-3	Arsenic	34	30	13 (≤50)	-	-

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-1	Barium	71	1700	184 (≤50)	J (all detects)	A
	Boron	35	31	12 (≤50)	-	-
	Chromium	29	24	19 (≤50)	-	-
	Cobalt	6.6	6.1	8 (≤50)	-	-
	Copper	23	18	24 (≤50)	-	-
	Iron	21000	19000	10 (≤50)	-	-
	Lead	8.6	8.7	1 (≤50)	-	-
	Magnesium	46000	37000	22 (≤50)	-	-
	Manganese	300	320	6 (≤50)	-	-
	Molybdenum	1.5	3.1U	70 (≤50)	NQ	-
	Nickel	19	16	17 (≤50)	-	-
	Phosphorus	850	830	2 (≤50)	-	-
	Strontium	150	160	6 (≤50)	-	-
	Zirconium	52	42	21 (≤50)	-	-
	Vanadium	52	53	2 (≤50)	-	-
	Mercury	0.087	0.020	125 (≤50)	NQ	-

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-19-50.0-20170420**	RI-19-50.0-20170420-FD**			
440-182699-1	Chromium	41	34	19 (≤50)	-	-

NQ = No data were qualified when either the primary or duplicate result was not detected or was below the practical quantitation limit (PQL).

XI. ICP Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

Raw data were not reviewed for Stage 2A validation.

XII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to MS/MSD %R, data were rejected in four samples.

Due to instrument calibration CRQL %R, MS/MSD %R and RPD, serial dilution %D, and field duplicate RPD, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Metals - Data Qualification Summary - SDGs 440-182697-1, 440-182697-3, 440-182699-1, 440-182699-3, 440-182777-1, 440-182779-1

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
440-182699-1	RI-19-30.0-20170420	Mercury	J+ (all detects)	P	Instrument calibration (CRQL %R) (c)
440-182699-3	RI-19-5.0-20170420 RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Antimony	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182699-3	RI-19-5.0-20170420 RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Niobium	R (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182697-1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Tungsten	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182699-1	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Tungsten	R (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182697-1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Tungsten Zirconium	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD) (ld)
440-182699-1	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Zirconium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD) (ld)
440-182697-1	RI-18-5.0-20170420 RI-18-10.0-20170420 RI-18-20.0-20170420 RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Barium Iron Magnesium Phosphorus Strontium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Serial dilution (%D) (sd)
440-182699-1	RI-19-5.0-20170420** RI-19-10.0-20170420 RI-19-20.0-20170420 RI-19-30.0-20170420	Barium Iron Magnesium Phosphorus Strontium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Serial dilution (%D) (sd)
440-182697-1	RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Barium	J (all detects)	A	Field duplicates (RPD) (fd)

NERT RI Phase 2, April 2017, Parcel F HRA
Metals - Laboratory Blank Data Qualification Summary – SDGs 440-182697-1, 440-182697-3, 440-182699-1, 440-182699-3, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Metals - Field Blank Data Qualification Summary – SDGs 440-182697-1, 440-182697-3, 440-182699-1, 440-182699-3, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

ATTACHMENT I

Wet Chemistry Data Validation Report

Chlorate by Environmental Protection Agency (EPA) Method 300.1B
Nitrate as Nitrate and Nitrite as Nitrogen by EPA Method 300.0
Nitrate/Nitrite as Nitrogen by Calculation Method
Perchlorate by EPA Method 314.0
Hexavalent Chromium by EPA SW 846 Method 7199

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

SDG	Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Affected Analyte	Flag	A or P
440-182777-1	RI-19-90.0-20170420	Nitrate as NO_3 Nitrite as N	55.22 hours	48 hours	Nitrate as NO_3 Nitrite as N Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

Initial calibration data were not reviewed for Stage 2A validation.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

Continuing calibration data were not reviewed for Stage 2A validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples RI-18-10.0-20170420-EB* (from SDG 440-182697-1) and RI-19-60.0-20170420-EB* (from SDG 440-182699-1) were identified as equipment blanks. No contaminants were found with the following exceptions:

SDG	Blank ID	Collection Date	Analyte	Concentration	Associated Samples
440-182697-1	RI-18-10.0-20170420-EB*	04/20/17	Hexavalent chromium	0.28 ug/L	RI-18-10.0-20170420

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks.

VI. Surrogates

Surrogates were added to all samples as required by EPA Method 300.1B. Surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Affected Analyte	Flag	A or P
440-182699-1	RI-19-110.0-20170421MS/MSD (RI-19-80.0-20170420)	Perchlorate	77 (80-120)	63 (80-120)	Perchlorate	J- (all detects)	A
440-182699-1	RI-19-5.0-20170420MS/MSD (RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-80.0-20170420)	Nitrate as NO_3	123 (80-120)	129 (80-120)	Nitrate as NO_3 Nitrate/Nitrite as N	J+ (all detects) J+ (all detects)	A
440-182699-1	RI-19-5.0-20170420MS/MSD (RI-19-70.0-20170420)	Nitrate as NO_3	123 (80-120)	129 (80-120)	Nitrate as NO_3 Nitrate/Nitrite as N	NA	-
440-182699-1	RI-19-5.0-20170420MS/MSD (All soil samples in SDG 440-182699-1)	Nitrite as N	54 (80-120)	-	Nitrite as N Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	A
440-182777-1	RI-19-110.0-20170421MS/MSD (All samples in SDG 440-182777-1)	Perchlorate	75 (80-120)	62 (80-120)	Perchlorate	J- (all detects) UJ (all non-detects)	A
440-182779-1	RI-18-95.0-20170421MS/MSD (All samples in SDG 440-182779-1)	Perchlorate	64 (80-120)	63 (80-120)	Perchlorate	UJ (all non-detects)	A

For RI-18-5.0-20170420MS/MSD, no data were qualified for Chlorate and Perchlorate percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
440-182699-1	RI-19-110.0-20170421MS/MSD (RI-19-80.0-20170420)	Perchlorate	21 (≤20)	J (all detects)	A
440-182777-1	RI-19-110.0-20170421MS/MSD (All samples in SDG 440-182777-1)	Perchlorate	21 (≤20)	J (all detects) UJ (all non-detects)	A

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in these SDGs, and therefore duplicate analyses were not performed for these SDGs.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-1), samples RI-19-50.0-20170420 and RI-19-50.0-20170420-FD (both from SDG 440-182699-1), and samples RI-18-125.0-20170421 and RI-18-125.0-20170421-FD (both from SDG 440-182779-1) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-1	Chlorate	8.6	8.1	6 (≤50)	-	-
	Nitrate as NO_3	110	13	158 (≤50)	J (all detects)	A
	Nitrate/Nitrite as N	24	3.0	156 (≤50)	J (all detects)	A
	Perchlorate	1.7	0.31	138 (≤50)	J (all detects)	A

SDG	Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
		RI-19-50.0-20170420	RI-19-50.0-20170420-FD			
440-182699-1	Chlorate	12	11	9 (≤50)	-	-
	Nitrate as NO_3	9.5	8.1	16 (≤50)	-	-
	Nitrate/Nitrite as N	2.1	1.8	15 (≤50)	-	-
	Perchlorate	0.28	0.37	28 (≤50)	-	-

XI. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in these SDGs.

Due to technical holding time, MS/MSD %R and RPD, and field duplicate RPD, data were qualified as estimated in thirty eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Wet Chemistry - Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
440-182777-1	RI-19-90.0-20170420	Nitrate as NO_3 Nitrite as N Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	P	Technical holding times (h)
440-182699-1	RI-19-80.0-20170420	Perchlorate	J- (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182699-1	RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-80.0-20170420	Nitrate as NO_3 Nitrate/Nitrite as N	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182699-1	RI-19-5.0-20170420** RI-19-10.0-20170420** RI-19-20.0-20170420** RI-19-30.0-20170420** RI-19-40.0-20170420** RI-19-50.0-20170420 RI-19-50.0-20170420-FD RI-19-60.0-20170420 RI-19-70.0-20170420 RI-19-80.0-20170420	Nitrite as N Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182777-1	RI-19-90.0-20170420 RI-19-95.0-20170420 RI-19-100.0-20170421 RI-19-105.0-20170421 RI-19-110.0-20170421 RI-19-115.0-20170421 RI-19-120.0-20170421 RI-19-125.0-20170421 RI-19-130.0-20170421 RI-19-135.0-20170421 RI-19-140.0-20170421 RI-19-145.0-20170421 RI-19-150.0-20170421	Perchlorate	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)
440-182779-1	RI-18-95.0-20170421 RI-18-100.0-20170421 RI-18-105.0-20170421 RI-18-110.0-20170421 RI-18-115.0-20170421 RI-18-120.0-20170421 RI-18-125.0-20170421 RI-18-125.0-20170421-FD RI-18-130.0-20170421 RI-18-135.0-20170421 RI-18-140.0-20170421 RI-18-145.0-20170421 RI-18-150.0-20170421	Perchlorate	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (m)

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
440-182699-1	RI-19-80.0-20170420	Perchlorate	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (ld)
440-182777-1	RI-19-90.0-20170420 RI-19-95.0-20170420 RI-19-100.0-20170421 RI-19-105.0-20170421 RI-19-110.0-20170421 RI-19-115.0-20170421 RI-19-120.0-20170421 RI-19-125.0-20170421 RI-19-130.0-20170421 RI-19-135.0-20170421 RI-19-140.0-20170421 RI-19-145.0-20170421 RI-19-150.0-20170421	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD) (ld)
440-182697-1	RI-18-30.0-20170420 RI-18-30.0-20170420-FD	Nitrate as NO_3 Nitrate/Nitrite as N Perchlorate	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD) (fd)

NERT RI Phase 2, April 2017, Parcel F HRA
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Wet Chemistry - Field Blank Data Qualification Summary - SDGs 440-182697-1, 440-182699-1, 440-182777-1, 440-182779-1

No Sample Data Qualified in these SDGs

ATTACHMENT J

Radium-226 Data Validation Report

Radium-226 by Environmental Protection Agency (EPA) Method 903.0

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Initial calibration data were not reviewed for Stage 2A validation.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

Continuing calibration data were not reviewed for Stage 2A validation.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-3) was identified as an equipment blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-3) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Isotope	Activity (pCi/g)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-3	Radium-226	1.22	1.67	31 (≤50)	-	-

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-226 - Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-226 - Laboratory Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-226 - Field Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

ATTACHMENT K

Radium-228 Data Validation Report

Radium-228 by Environmental Protection Agency (EPA) Method 904.0

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Initial calibration data were not reviewed for Stage 2A validation.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

Continuing calibration data were not reviewed for Stage 2A validation.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-3) was identified as an equipment blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-3) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Isotope	Activity (pCi/g)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
440-182697-3	Radium-228	1.45	1.43	1 (≤50)	-	-

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-228 - Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-228 - Laboratory Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Radium-228 - Field Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

ATTACHMENT L

Isotopic Thorium Data Validation Report

Isotopic Thorium by Method A-01-R Modified

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Initial calibration data were not reviewed for Stage 2A validation.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

Continuing calibration data were not reviewed for Stage 2A validation.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample RI-18-10.0-20170420-EB* (from SDG 440-182697-3) was identified as an equipment blank. No contaminants were found with the following exceptions:

SDG	Blank ID	Sampling Date	Isotope	Activity	Associated Samples
440-182697-3	RI-18-10.0-20170420-EB*	04/20/17	Thorium-230	0.171 pCi/L	RI-18-10.0-20170420

Sample activities were compared to activities detected in the field blanks. The sample activities were either not detected or were significantly greater than the activities found in the associated field blanks.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples RI-18-30.0-20170420 and RI-18-30.0-20170420-FD (both from SDG 440-182697-3) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

SDG	Isotope	Activity (pCi/g)		RPD (Limits)	Flag	A or P
		RI-18-30.0-20170420	RI-18-30.0-20170420-FD			
160-21233-1	Thorium-228	1.38	1.43	4 (≤50)	-	-
	Thorium-230	1.53	2.32	41 (≤50)	-	-
	Thorium-232	1.24	1.35	8 (≤50)	-	-

X. Tracer Recovery

All tracer recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which underwent Stage 4 validation. Raw data were not reviewed for Stage 2A and Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NERT RI Phase 2, April 2017, Parcel F HRA
Isotopic Thorium - Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Isotopic Thorium - Laboratory Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs

NERT RI Phase 2, April 2017, Parcel F HRA
Isotopic Thorium - Field Blank Data Qualification Summary - SDGs 440-182697-3, 440-182699-3

No Sample Data Qualified in these SDGs