



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

ENVIRON International Corporation
6001 Shellmound Street, Suite 700
Emeryville, CA 94608
ATTN: Mr. Craig Knox

October 19, 2011

**SUBJECT: Revised Data Validation Summary Report
January to July 2011
Annual Remedial Performance Sampling
Nevada Environmental Response Trust (NERT)
Henderson, Nevada**

Dear Mr. Knox,

Enclosed is the Revised Data Validation Summary Report for January to July 2011 Annual Remedial Performance Sampling; Nevada Environmental Response Trust (NERT); Henderson, Nevada

We appreciate this opportunity to support ENVIRON International Corporation in the performance of this project.

Please feel free to call me at (760) 634-0437 if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

**Data Validation Summary Report
January to July 2011
Annual Remedial Performance Sampling
Nevada Environmental Response Trust (NERT)
Henderson, Nevada**

Prepared for

ENVIRON International Corporation
Emeryville, California

Prepared by

Laboratory Data Consultants, Inc.
7750 El Camino Real, Suite 2C
Carlsbad, California 92009

October 19, 2011

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LIST OF ACRONYMS AND ABBREVIATIONS

DQO	Data Quality Objectives
DUP	Duplicate
DVSR	Data Validation Summary Report
ICV	Initial Calibration Verification
LCS/LCSD	Laboratory Control Sample / Laboratory Control Sample Duplicate
LDC	Laboratory Data Consultants, Inc.
MS/MSD	Matrix Spike / Matrix Spike Duplicate
PARCC	Precision, Accuracy, Representativeness, Comparability, Completeness
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SQL	Sample Quantitation Limit
ug/L	Micrograms per Liter
ug/Kg	Micrograms per Kilogram
mg/L	Milligram per Liter
mg/Kg	Milligram per Kilogram
USEPA	United States Environmental Protection Agency
%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 Annual Remedial Performance Sampling conducted at the Nevada Environmental Response Trust (NERT) site in Henderson, Nevada. The assessment was performed by ENVIRON as a part of the *Revised Phase B Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada* dated May 2009 and included the collection and analyses of 576 environmental and quality control (QC) samples. The analyses were performed by the following methods:

Chromium by EPA SW 846 Method 6010 and EPA Method 200.7

Wet Chemistry:

Hexavalent Chromium by EPA SW 846 Method 7196

Total Dissolved Solids by EPA Method 160.1 and Standard Method 2540C

Perchlorate by EPA Method 314.0

Laboratory analytical services were provided by MWH Laboratories, Inc. The samples were grouped into sample delivery groups (SDGs). The water samples are associated with 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, and matrix. All shaded samples in Table I were reviewed under Stage 4 validation guidelines.

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, approximately ninety percent of the analytical data were validated according to Stage 2A data validation procedures and ten percent of the analytical data were validated according to Stage 4 data validation procedures. The analytical data were evaluated for quality assurance and quality control (QA/QC) based on the following documents: *Basic Remediation Company (BRC) Standard Operating Procedures (SOP) 40 Data Review/Validation*, Revision 1, July 2007, *Revised Phase B Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (QAPP)*, Revision, May 2009, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004, 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.

This report summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, and comparability (PARCC) 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 PARCC 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 PARCC criteria. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 5.0 presents a summary of the PARCC criteria by comparing quantitative parameters with acceptability criteria defined in the project DQO's. Qualitative PARCC 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: equipment blanks, field blanks, field duplicates, method blanks, laboratory control samples and laboratory control sample duplicates (LCS/LCSDs), laboratory duplicates (DUP), and matrix spike/matrix spike duplicates (MS/MSDs).

Before conducting the PARCC evaluation, the analytical data were validated according to the BRC SOP-40 (July 2007), QAPP (May 2009), Functional Guidelines (USEPA 2004), 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 compound or 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. The "R" designation is also applied to yield only one complete set of data for a given sample and eliminate redundant data.
- U Nondetected Analyses were performed for the compound or analyte, but it was not detected. The "U" designation is also applied to suspected blank contamination. The "U" flag is used to qualify any result that is detected in an environmental sample and associated blank at less than the PQL.
- UJ Estimated/Nondetected Analyses were performed for the compound or analyte, but it was not detected and the sample quantitation or detection limit is an estimated quantity due to poor accuracy or precision. This qualification is also used to flag possible false negative results in the case where low bias in the analytical system is indicated by low calibration response, surrogate, or other spike recovery.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.
- 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 > 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 or J+ or J-	The UJ flag is used when a non-detected (U) flag is added to a biased (J+ or J-) or non-biased flag (J).

Table II 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 III 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 BRC SOP-40, QAPP, functional guidelines, and EPA Test Methods, the data set is then evaluated using PARCC criteria. PARCC criteria provide an evaluation of overall data usability. The following is a discussion of PARCC 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 percent recovery data. Precision is expressed as the relative percent difference (RPD):

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

where:

D1 = reported concentration for the sample

D2 = reported concentration for the duplicate

Precision is primarily assessed by calculating an RPD from the percent recoveries of the spiked compounds for each sample in the MS/MSD pair. In the absence of an MS/MSD pair, a laboratory duplicate or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. An additional measure of sampling precision was obtained by collecting and analyzing field duplicate samples, which were compared using the RPD 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 is used to prepare aqueous LCS. The LCS measures laboratory efficiency in recovering target analytes from either an aqueous matrix in the absence of matrix interferences.

One primary sample is analyzed and accompanied by an unspiked laboratory duplicate. The data reviewer compares the reported results of the primary analysis and the laboratory duplicate, then calculates RPDs, which are used to assess laboratory precision.

Laboratory and field sampling precision are evaluated by calculating RPDs for aqueous 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 either MS/MSD samples or LCS/LCSD indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. Thus, the actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample matrix interference, improper sample collection or handling, inconsistent sample preparation, 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 LCSD. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. 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 and LCS/LCSD 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 method blanks, equipment blanks and field blanks.

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

Initial and continuing calibration blanks 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.

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

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

Contaminants found in both the environmental sample and the blank samples are assumed to be laboratory artifacts if both values are less than the PQL.

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. In accordance with EPA guidance (USEPA 2004), sample results for analyses that were performed after the method holding time but less than two times the method holding time were qualified as estimated (J- or UJ) and sample results for analyses that were performed after two times the method holding time were qualified as rejected (R).

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 PARCC 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.

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

2.0 METALS

A total of 375 water samples were analyzed for chromium by EPA SW 846 Method 6010 and EPA Method 200.7. All metal data were assessed to be valid since none of the 375 total results were rejected based on holding time and QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCC criteria and evaluated based on the DQOs.

2.1 Precision and Accuracy

2.1.1 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 and the %Rs in the continuing calibration verification met the acceptance criteria of 90-110%.

2.1.2 MS/MSD Samples

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

2.1.3 LCS/LCSD Samples

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

2.1.4 Field Duplicate Samples

The field duplicate samples were evaluated for acceptable precision with RPDs or difference in instances the results were less than five times the reporting limit for the compounds. All RPDs or difference met the acceptance criteria.

2.1.5 ICP Interference Check Sample

All ICP interference check %Rs met acceptance criteria.

2.1.6 Analyte Quantitation and Target Identification

Raw data were evaluated for the Stage 4 samples. All analyte quantitation and target identifications were acceptable.

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 180-day analysis holding time criteria for chromium.

2.2.2 Blanks

Method blanks, equipment blanks, and field blanks were analyzed to evaluate representativeness. The concentration for an individual target compound in any of the three 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 concentration reported in the sample results.

Results Above the PQL If a sample result and blank contaminant value were greater than the PQL and less than 10 times the blank contaminant value, the sample result was qualified as detected estimated (J+) at the concentration reported in the sample results.

No Action If a sample result and blank contaminant values were greater than the PQL, the result was not amended.

2.2.2.1 Method Blanks

As a result of contamination found in the laboratory blanks, eight chromium results were qualified as detect estimated (J). The details regarding the qualification of results are presented in Attachment A, Section IV.

2.2.2.2 Equipment and Field Blanks

No data were qualified due to the contaminants detected in the equipment and field blanks for this analysis.

2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the Sample Quantitation Limits (SQLs) attained were at or below the PQLs. Methods 6010 and 200.7 both utilize multielemental determinations by inductively coupled plasma-atomic emission spectrometry using simultaneous optical systems and axial or radial viewing of the plasma, the comparability of the metals data is regarded as acceptable.

2.4 Completeness

The completeness level attained for metal 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.

3.0 WET CHEMISTRY

A total of 28 water samples were analyzed for hexavalent chromium by EPA SW 846 Method 7196; 574 water samples were analyzed for perchlorate by EPA Method 314.0; and 576 water samples were analyzed for total dissolved solids by EPA Method 160.1 and Standard Method 2540C. All wet chemistry data were assessed to be valid with the exception of three of the 1,178 total results which was rejected based on holding time exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCC criteria and evaluated based on the DQOs.

3.1 Precision and Accuracy

3.1.1 Instrument Calibration

As previously discussed in Section 2.1.1, initial and continuing calibration results provide a means of evaluating accuracy.

The correlation coefficients in the initial calibrations were within the acceptance criteria of ≥ 0.995 and the %Rs in the continuing calibration verification met the acceptance criteria of 90-110%.

3.1.2 MS/MSD Samples

Due to MS/MSD %Rs and RPDs outside of the acceptance criteria, 5 perchlorate and hexavalent chromium results were qualified as detected estimated (J) or non-detected estimated (UJ). The details regarding the qualification of results are presented in Attachment B, Section V.

3.1.3 Duplicate (DUP) Samples

All DUP RPDs met the acceptance criteria.

3.1.4 LCS/LCSD Samples

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

3.1.5 Field Duplicate Samples

The field duplicate samples were evaluated for acceptable precision with RPDs or difference in instances the results were less than five times the reporting limit for the compounds. Four hexavalent chromium results were qualified as detected estimated (J) or non-detected estimated (UJ) due to difference in field duplicate pairs M-13 and VD-8 and M-10 and VD-9. The details regarding the qualification of results are presented in Attachment B, Section IX.

3.1.6 Analyte Quantitation and Target Identification

Raw data were evaluated for the Stage 4 samples. All analyte quantitation and target identifications were acceptable.

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 water samples met the 28-day analysis holding time criteria for perchlorate.

Due to a severe holding time criteria exceedance the hexavalent chromium results for samples EB-1, M-10 (sampled on 02/09/11), and M-10 (sampled on 05/13/11) were qualified as rejected (R). Additionally, eighteen results for hexavalent chromium and total dissolved solids were qualified as detected estimated (J-) or non-detected estimated (UJ). The analysis holding time criteria for water samples is 24 hours for hexavalent chromium and 7 days for total dissolved solids. The details regarding the qualification of results are presented in Attachment B, Section I.

3.2.2 Blanks

As previously discussed in Section 2.2.2, method blanks, field blanks and equipment blanks were analyzed to evaluate representativeness.

3.2.2.1 Method Blanks

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

3.2.2.2 Equipment and Field Blanks

As a result of contamination found in the equipment blanks, two perchlorate results for samples M-19 and M-183 were qualified as detected estimated (J+). The details regarding the qualification of results are presented in Attachment B, Section IV.

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. Methods 160.1 and 2540C both utilize a well-mixed sample filtered through a glass fiber filter and the residue retained on the filter is dried to constant weight at 103-105°C, the comparability of the total dissolved solids data is regarded as acceptable.

3.4 Completeness

The completeness level attained for wet chemistry field samples was 99.7 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

4.0 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.

5.0 SUMMARY OF PARCC CRITERIA

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

5.1 Precision and Accuracy

Precision and accuracy were evaluated using data quality indicators such as calibration, surrogates, MS/MSD, DUP, LCS/LCSD, 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. All surrogate, MS/MSD, DUP, LCS/LCSD, and field duplicate percent recoveries, RPDs, and difference met acceptance criteria with the exceptions noted in Sections 3.1.2 and 3.1.5. All ICP interference check sample %Rs met acceptance criteria.

5.2 Representativeness

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

5.3 Comparability

Sampling frequency requirements were met in obtaining necessary field blanks and field duplicates. The laboratory used standard analytical methods for the analyses. The analytical results were reported in correct standard units. Sample preservation, and sample integrity criteria were met. Holding times were within QC criteria with the exceptions noted in Section 3.2.1. The overall comparability is considered acceptable.

5.4 Completeness

Of the 1,553 total analytes reported, one sample result was rejected. The completeness for the SDG is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
Metals	375	0	100
Wet Chemistry	1,178	3	99.7
Total	1,553	3	99.8

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

6.0 CONCLUSIONS AND RECOMMENDATIONS

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

7.0 REFERENCES

NDEP Data Verification and Validation Requirements - Supplement established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada, April, 13, 2009,

Basic Remediation Company (BRC) Standard Operating Procedures, SOP-40 Data Review/Validation, Revision 1, July 2007,

Revised Phase B Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (QAPP), Revision, May 2009,

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

USEPA 2004. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

_____,1983. *EPA Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Cincinnati, Ohio*, March 1983

_____,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*

Standard Method for the Examination of Water and Wastewater, 20th Edition, 1998

TABLE I

SDG#: 352736

VALIDATION SAMPLE TABLE

LDC#: 25231A

Project Name: 2011 Annual Remedial Performance Sampling		Parameters/Analytical Method																		
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)														
ART-1	201101050198	water		01/04/11	X	X														
ART-2	201101050199	water		01/04/11	X	X														
ART-3	201101050200	water		01/04/11	X	X														
ART-6	201101050201	water		01/04/11	X	X														
ART-7	201101050202	water		01/04/11	X	X														
ART-8	201101050203	water		01/04/11	X	X														
PC-99R2/R3	201101050204	water		01/04/11	X	X														
PC-115R	201101050205	water		01/04/11	X	X														
PC-116R	201101050206	water		01/04/11	X	X														
PC-121	201101050207	water		01/04/11	X	X														
PC-120	201101050208	water		01/04/11	X	X														
PC-119	201101050209	water		01/04/11	X	X														
PC-118	201101050210	water		01/04/11	X	X														
PC-117	201101050212	water		01/04/11	X	X														
PC-133	201101050214	water		01/04/11	X	X														
ART-9	201101050215	water		01/04/11	X	X														

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 353633

VALIDATION SAMPLE TABLE

LDC#: 25231B

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)														
ARP-7	201101140353	water		01/13/11	X	X														
PC-53	201101140354	water		01/13/11	X	X														
PC-103	201101140355	water		01/13/11	X	X														
MW-K5	201101140356	water		01/13/11	X	X														
PC-55	201101140357	water		01/11/11	X	X														
PC-101R	201101140358	water		01/11/11	X	X														
PC-97	201101140359	water		01/11/11	X	X														
PC-91	201101140360	water		01/11/11	X	X														
PC-18	201101140361	water		01/11/11	X	X														
PC-122	201101140362	water		01/13/11	X	X														
M-83DUP	201101140332DUP	water	DUP	01/13/11		X														

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355312

VALIDATION SAMPLE TABLE

LDC#: 25231C

Client ID #	Lab ID #	Matrix	QC Type	Parameters/Analytical Method								
				Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)				
PC-123	201102080514	water		02/07/11	X	X	X					
PC-128	201102080515	water		02/07/11	X	X	X					
PC-129	201102080516	water		02/07/11	X	X	X					
PC-130	201102080518	water		02/07/11	X	X	X					
PC-131	201102080519	water		02/07/11	X	X	X					
PC-132	201102080520	water		02/07/11	X	X	X					
PC-124	201102080521	water		02/07/11	X	X	X					
PC-125	201102080522	water		02/07/11	X	X	X					
PC-126	201102080524	water		02/07/11	X	X	X					
PC-127	201102080525	water		02/07/11	X	X	X					
VFB-1	201102080526	water	FB	02/07/11	X	X	X	X				
M-96	201102080527	water		02/07/11	X	X	X					
PC-54	201102080528	water		02/07/11	X	X	X					
PC-71	201102080529	water		02/07/11	X	X	X					
PC-72	201102080530	water		02/07/11	X	X	X					
PC-73	201102080531	water		02/07/11	X	X	X					
PC-37	201102080532	water	FD	02/07/11	X	X	X					

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355312

VALIDATION SAMPLE TABLE

LDC#: 25231C

Client ID #		Lab ID #		Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)						
Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method																
M-23		201102080533		water		02/07/11	X	X	X							
M-48A		201102080534		water		02/07/11	X	X	X							
M-44		201102080535		water		02/07/11	X	X	X	X						
M-95		201102080536		water		02/07/11	X	X	X							
VD-2711		201102080537		water	FD	02/07/11	X	X	X							
M-64		201102080538		water		02/07/11	X	X	X							
VFB-1MS		201102080526MS		water	MS	02/07/11	X	X								
VFB-1MSD		201102080526MSD		water	MSD	02/07/11	X	X								
PC-73MS		201102080531MS		water	MS	02/07/11	X									
PC-73MSD		201102080531MSD		water	MSD	02/07/11	X									
M-48ADUP		201102080534DUP		water	DUP	02/07/11			X							
M-95MS		201102080536MS		water	MS	02/07/11	X									
M-95MSD		201102080536MSD		water	MSD	02/07/11	X									
VD-2711MS		201102080537MS		water	MS	02/07/11	X									
VD-2711MSD		201102080537MSD		water	MSD	02/07/11	X									

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spikes, MSD = Matrix Spike Duplicate

SDG#: 355326

VALIDATION SAMPLE TABLE

LDC#: 25828A

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
ART-1	201102080606	water		02/07/11	X	X	X											
ART-2	201102080607	water		02/07/11	X	X	X											
ART-3	201102080608	water		02/07/11	X	X	X											
ART-4	201102080609	water		02/07/11	X	X	X											
ART-6	201102080610	water		02/07/11	X	X	X											
ART-7	201102080611	water		02/07/11	X	X	X											
ART-8	201102080612	water		02/07/11	X	X	X											
PC-99R2/R3	201102080613	water		02/07/11	X	X	X											
PC-115R	201102080614	water		02/07/11	X	X	X											
PC-116R	201102080616	water		02/07/11	X	X	X											
SF-1	201102080618	water		02/07/11	X	X	X											
PC-117	201102080621	water		02/07/11	X	X	X											
PC-118	201102080624	water		02/07/11	X	X	X											
PC-119	201102080625	water		02/07/11	X	X	X											
PC-120	201102080626	water		02/07/11	X	X	X											
PC-121	201102080628	water		02/07/11	X	X	X											
PC-133	201102080630	water		02/07/11	X	X	X											

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355326

VALIDATION SAMPLE TABLE

LDC#: 25828A

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
ART-9	201102080632	water		02/07/11	X	X	X											
PC-115RMS	201102080614MS	water	MS	02/07/11		X												
PC-115RMSD	201102080614MSD	water	MSD	02/07/11		X												
PC-119DUP	201102080625DUP	water	DUP	02/07/11			X											
PC-120DUP	201102080626DUP	water	DUP	02/07/11			X											
PC-121DUP	201102080628DUP	water	DUP	02/07/11			X											

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355393

VALIDATION SAMPLE TABLE

LDC#: 25231D

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Cifent ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)							
I-RMS	201102090107MS	water	MS	02/08/11	X										
I-RMSD	201102090107MSD	water	MSD	02/08/11	X										
M-37MS	201102090119MS	water	MS	02/08/11	X										
M-37MSD	201102090119MSD	water	MSD	02/08/11	X										
VD2811MS	201102090120MS	water	MS	02/08/11				X							
VD2811MSD	201102090120MSD	water	MSD	02/08/11				X							
VEB-1MS	201102090121MS	water	MS	02/08/11		X									
VEB-1MSD	201102090121MSD	water	MSD	02/08/11		X									
M-57AMS	201102090114MS	water	MS	02/08/11		X									
M-57AMS	201102090114MSD	water	MSD	02/08/11		X									
I-AAMS	201102090122MS	water	MS	02/08/11	X										
I-AAMS	201102090122MSD	water	MSD	02/08/11	X										

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355771

VALIDATION SAMPLE TABLE

LDC#: 25231E

Client ID #		Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)						
Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method															
M-92		201102110018	water		02/09/11	X	X	X							
M-97		201102110034	water		02/09/11	X	X	X							
M-31A		201102110035	water		02/09/11	X	X	X							
M-52		201102110036	water		02/09/11	X	X	X							
M-35		201102110037	water		02/09/11	X	X	X							
M-19		201102110038	water		02/09/11	X	X	X							
M-73		201102110039	water		02/09/11	X	X	X							
M-74		201102110040	water		02/09/11	X	X	X							
M-67		201102110041	water		02/09/11	X	X	X							
M-68		201102110042	water		02/09/11	X	X	X							
M-39		201102110043	water	FD1	02/09/11	X	X	X							
M-12A		201102110044	water		02/09/11	X	X	X	X						
M-11		201102110045	water	FD2	02/09/11	X	X	X	X						
M-10		201102110046	water		02/09/11	X	X	X	X						
VD2911		201102110047	water	FD1	02/09/11	X	X	X							
2VD2911		201102110048	water	FD2	02/09/11	X	X	X	X						
I-Z		201102110049	water		02/09/11	X	X	X							

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355771

VALIDATION SAMPLE TABLE

LDC#: 25231E

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	Cr(VI) (7196)	TDS (160.1/2540C)	ClO ₄ (314.0)										
M-74MSD	201102110040MSD	water	MSD	02/09/11	X													
M-10DUP	201102110046DUP	water	DUP	02/09/11			X											
M-115MS	201102110059MS	water	MS	02/10/11	X													
M-115MSD	201102110059MSD	water	MSD	02/10/11	X													

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 355851		VALIDATION SAMPLE TABLE										LDC#: 25231F					
Client ID #		Annual Remedial Performance Sampling				Parameters/Analytical Method											
Lab ID #		Matrix	QC Type	Date Collected	Cr (200.7)	TDS (160.1/2540C)											
M-10		water		02/09/11	X	X											

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 356562

VALIDATION SAMPLE TABLE

LDC#: 25231G

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)													
MW-K4	201102190058	water		02/15/11	X	X	X													
ARP-1	201102190059	water		02/14/11	X	X	X													
ARP-2A	201102190060	water		02/15/11	X	X	X													
ARP-3A	201102190061	water		02/15/11	X	X	X													
ARP-4A	201102190062	water		02/15/11	X	X	X													
ARP-5A	201102190063	water		02/15/11	X	X	X													
ARP-6B	201102190064	water		02/15/11	X	X	X													
ARP-7	201102190065	water		02/15/11	X	X	X													
PC-53	201102190066	water		02/15/11	X	X	X													
PC-103	201102190067	water		02/17/11	X	X	X													
MW-K5	201102190068	water		02/15/11	X	X	X													
ART-7B	201102190069	water		02/15/11	X	X	X													
M-83	201102190070	water		02/17/11	X	X	X													
PC-98R	201102190071	water		02/17/11	X	X	X													
PC-86	201102190072	water		02/14/11	X	X	X													
PC-90	201102190073	water		02/14/11	X	X	X													
PC-56	201102190074	water		02/14/11	X	X	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 356562

VALIDATION SAMPLE TABLE

LDC#: 25231G

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)											
ARP-6BMS	201102190064MS	water	MS	02/15/11		X												
ARP-6BMSD	201102190064MSD	water	MSD	02/15/11		X												
M-83MS	201102190070MS	water	MS	02/17/11	X													
M-83MSD	201102190070MSD	water	MSD	02/17/11	X													
M-83DUP	201102190070DUP	water	DUP	02/17/11			X											
PC-66DUP	201102190072DUP	water	DUP	02/14/11			X											
PC-66DUP	201102190079DUP	water	DUP	02/14/11			X											
PC-137MS	201102190087MS	water	MS	02/15/11	X													
PC-137MSD	201102190087MSD	water	MSD	02/15/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 356562

VALIDATION SAMPLE TABLE

LDC#: 25726A

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)							
MW-K4	21102190058	water		02/15/11	X	X	X							
ARP-1	21102190059	water		02/14/11	X	X	X							
ARP-2A	21102190060	water		02/15/11	X	X	X							
ARP-3A	21102190061	water		02/15/11	X	X	X							
ARP-4A	21102190062	water		02/15/11	X	X	X							
ARP-5A	21102190063	water		02/15/11	X	X	X							
ARP-6B	21102190064	water		02/15/11	X	X	X							
ARP-7	21102190065	water		02/15/11	X	X	X							
PC-53	21102190066	water		02/15/11	X	X	X							
PC-103	21102190067	water		02/15/11	X	X	X							
MW-K5	21102190068	water		02/15/11	X	X	X							
ART-7B	21102190069	water		02/15/11	X	X	X							
M-83	21102190070	water		02/17/11	X	X	X							
PC-98R	21102190071	water		02/17/11	X	X	X							
PC-86	21102190072	water		02/14/11	X	X	X							
PC-90	21102190073	water		02/14/11	X	X	X							
PC-56	21102190074	water		02/14/11	X	X	X							

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Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 356562

VALIDATION SAMPLE TABLE

LDC#: 25726A

Client ID #	Lab ID #	Matrix	QC Type	Parameters/Analytical Method		Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)												
				Annual Remedial Performance Sampling	Analytical Method																
PC-58	21102190075	water				02/14/11	X	X	X												
PC-59	21102190076	water				02/14/11	X	X	X												
PC-60	21102190077	water				02/14/11	X	X	X												
PC-62	21102190078	water				02/14/11	X	X	X												
PC-68	21102190079	water				02/14/11	X	X	X												
PC-122	21102190080	water				02/15/11	X	X	X												
PC-91	21102190081	water				02/14/11	X	X	X												
PC-97	21102190082	water				02/14/11	X	X	X												
PC-18	21102190083	water				02/14/11	X	X	X												
PC-55	21102190084	water				02/14/11	X	X	X												
PC-101R	21102190085	water				02/14/11	X	X	X												
PC-136	21102190086	water				02/15/11	X	X	X												
PC-137	21102190087	water				02/15/11	X	X	X												
PC-92	21102190088	water				02/14/11	X	X	X												
PC-94	21102190089	water				02/14/11	X	X	X												
ARP-1MS	21102190059MS	water				02/14/11	X														
ARP-1MSD	21102190059MSD	water				02/14/11	X														

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 356562

VALIDATION SAMPLE TABLE

LDC#: 25726A

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
ARP-6BMS	21102190064MS	water	MS	02/15/11		X												
ARP-6BMSD	21102190064MSD	water	MSD	02/15/11		X												
M-83MS	21102190070MS	water	MS	02/17/11	X													
M-83MSD	21102190070MSD	water	MSD	02/17/11	X													
M-83DUP	21102190070DUP	water	DUP	02/17/11			X											
PC-86DUP	21102190072DUP	water	DUP	02/14/11			X											
PC-68DUP	21102190079DUP	water	DUP	02/14/11			X											
PC-137MS	21102190087MS	water	MS	02/15/11	X													
PC-137MSD	21102190087MSD	water	MSD	02/15/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 360519

VALIDATION SAMPLE TABLE

LDC#: 25828B

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)												
ART-9	201104050089	water		04/04/11	X	X												

Shaded cells indicate sample underwent Stage 4
EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 361946

VALIDATION SAMPLE TABLE

LDC#: 25726D

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)																				
MW-K4	201104160076	water		04/12/11	X	X																				
ARP-1	201104160077	water		04/12/11	X	X																				
ARP-2A	201104160078	water		04/12/11	X	X																				
ARP-3A	201104160079	water		04/12/11	X	X																				
ARP-4A	201104160080	water		04/12/11	X	X																				
ARP-5A	201104160081	water		04/12/11	X	X																				
ARP-6B	201104160082	water		04/12/11	X	X																				
ARP-7	201104160083	water		04/12/11	X	X																				
PC-53	201104160084	water		04/12/11	X	X																				
PC-103	201104160086	water		04/12/11	X	X																				
MW-K5	201104160087	water		04/12/11	X	X																				
ARP-7B	201104160088	water		04/14/11	X	X																				
M-83	201104160089	water		04/14/11	X	X																				
PC-98R	201104160090	water		04/12/11	X	X																				
PC-86	201104160091	water		04/11/11	X	X																				
PC-90	201104160092	water		04/11/11	X	X																				
PC-56	201104160093	water		04/11/11	X	X																				

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 361946

VALIDATION SAMPLE TABLE

LDC#: 25726D

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Citent ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)																					
PC-58	201104160094	water		04/11/11	X	X																					
PC-59	201104160095	water		04/11/11	X	X																					
PC-60	201104160096	water		04/11/11	X	X																					
PC-62	201104160097	water		04/11/11	X	X																					
PC-68	201104160098	water		04/11/11	X	X																					
PC-122	201104160099	water		04/12/11	X	X																					
PC-91	201104160100	water		04/11/11	X	X																					
PC-97	201104160101	water		04/11/11	X	X																					
PC-18	201104160102	water		04/12/11	X	X																					
PC-55	201104160104	water		04/11/11	X	X																					
PC-101R	201104160106	water		04/13/11	X	X																					
M-83DUP	201104160089DUP	water	DUP	04/14/11		X																					
PC-86DUP	201104160091DUP	water	DUP	04/11/11		X																					
PC-68DUP	201104160098DUP	water	DUP	04/11/11		X																					

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363400

VALIDATION SAMPLE TABLE

LDC#: 25726E

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
ART-9	201105030291	water		05/02/11	X	X	X											
ART-7MS	201105030279MS	water	MS	05/02/11	X													
ART-7MSD	201105030279MSD	water	MSD	05/02/11	X													
PC-116RMS	201105030283MS	water	MS	05/02/11	X													
PC-116MSD	201105030283MSD	water	MSD	05/02/11	X													
PC-119DUP	201105030287DUP	water	DUP	05/02/11			X											
PC-120DUP	201105030288DUP	water	DUP	05/02/11			X											

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363458

VALIDATION SAMPLE TABLE

LDC#: 25726F

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)											
PC-128	201105030512	water		05/02/11	X	X	X												
PC-129	201105030513	water		05/02/11	X	X	X												
PC-130	201105030514	water		05/02/11	X	X	X												
PC-131	201105030515	water		05/02/11	X	X	X												
PC-132	201105030516	water		05/02/11	X	X	X												
PC-50	201105030517	water		05/02/11	X	X	X												
PC-124	201105030518	water		05/02/11	X	X	X												
PC-125	201105030519	water		05/02/11	X	X	X												
PC-126	201105030520	water		05/02/11	X	X	X												
PC-24	201105030521	water		05/02/11	X	X	X												
PC-127	201105030522	water		05/02/11	X	X	X												
PC-86	201105030523	water		05/02/11	X	X	X												
I-R	201105030524	water		05/02/11	X	X	X												
I-L	201105030525	water		05/02/11	X	X	X												
I-B	201105030526	water		05/02/11	X	X	X												
I-AR	201105030527	water		05/02/11	X	X	X												
I-S	201105030528	water		05/02/11	X	X	X												

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363458

VALIDATION SAMPLE TABLE

LDC#: 25726F

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)										
PC-82	201105030529	water		05/02/11	X	X	X											
PC-79	201105030530	water		05/02/11	X	X	X											
EB-1	201105030531	water	EB	05/02/11	X	X	X	X										
PC-125MS	201105030519MS	water	MS	05/02/11	X													
PC-125MSD	201105030519MSD	water	MSD	05/02/11	X													
PC-125DUP	201105030519DUP	water	DUP	05/02/11			X											
PC-86DUP	201105030523DUP	water	DUP	05/02/11			X											
I-RMS	201105030524MS	water	MS	05/02/11	X													
I-RMSD	201105030524MSD	water	MSD	05/02/11	X													
EB-1MS	201105030531MS	water	MS	05/02/11				X										
EB-1MSD	201105030531MSD	water	MSD	05/02/11				X										

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363516

VALIDATION SAMPLE TABLE

LDC#: 25726G

Project Name: 2011 Annual Remedial Performance Sampling		Parameters/Analytical Method												
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)						
PC-123	201105040129	water		05/03/11	X	X	X							
FB-1	201105040130	water	FB	05/03/11	X	X	X	X						
PC-77	201105040131	water		05/03/11		X	X							
PC-96	201105040132	water		05/03/11		X	X							
PC-108	201105040133	water		05/03/11		X	X							
PC-110	201105040134	water		05/03/11		X	X							
PC-111	201105040135	water		05/03/11		X	X							
PC-150	201105040136	water		05/03/11	X	X	X							
PC-143	201105040137	water		05/03/11	X	X	X							
PC-145	201105040138	water		05/03/11	X	X	X							
PC-2	201105040139	water		05/03/11	X	X	X							
PC-4	201105040140	water		05/03/11	X	X	X							
PC-108DUP	201105040133DUP	water	DUP	05/03/11			X							
PC-145MS	201105040138MS	water	MS	05/03/11	X									
PC-145MSD	201105040138MSD	water	MSD	05/03/11	X									

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363519		VALIDATION SAMPLE TABLE										LDC#: 25726H		
Project Name: 2011 Annual Remedial Performance Sampling												Parameters/Analytical Method		
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)								
PC-74	201105040150	water		05/03/11	X	X								
HM-2	201105040151	water		05/03/11	X	X								
PC-144	201105040152	water		05/03/11	X	X								

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363698

VALIDATION SAMPLE TABLE

LDC#: 257261

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)					
AA-01	201105050057	water		05/04/11		X	X						
PC-137	201105050065	water		05/04/11	X	X	X						
PC-142	201105050066	water		05/04/11		X	X						
HMW-16	201105050067	water		05/04/11		X	X						
HMW-15	201105050068	water		05/04/11		X	X						
HMW-14	201105050069	water		05/04/11		X	X						
HMW-13	201105050070	water		05/04/11		X	X						
PC-64	201105050071	water		05/04/11	X	X	X						
PC-65	201105050072	water		05/04/11	X	X	X						
PC-66	201105050073	water		05/04/11	X	X	X						
PC-67	201105050074	water		05/04/11	X	X	X						
PC-31	201105050075	water		05/04/11	X	X	X						
EB-2	201105050076	water	EB	05/04/11	X	X	X	X					
PC-28	201105050077	water		05/04/11	X	X	X						
PC-107	201105050078	water		05/04/11	X	X	X						
M-96	201105050079	water		05/04/11	X	X	X						
M-95	201105050080	water		05/04/11	X	X	X	X					

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363698

VALIDATION SAMPLE TABLE

LDC#: 257261

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)							
HMW-14DUP	201105050069DUP	water	DUP	05/04/11			X								
PC-65DUP	201105050072DUP	water	DUP	05/04/11			X								
EB-2MS	201105050076MS	water	MS	05/04/11	X			X							
EB-2MSD	201105050076MSD	water	MSD	05/04/11	X			X							

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363960

VALIDATION SAMPLE TABLE

LDC#: 25726J

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)										
PC-71	201105060397	water		05/05/11	X	X	X											
PC-72	201105060398	water		05/05/11	X	X	X											
PC-73	201105060399	water		05/05/11	X	X	X											
PC-40	201105060400	water		05/05/11	X	X	X											
H-58A	201105060401	water		05/05/11	X	X	X											
H-48	201105060402	water		05/05/11	X	X	X											
MC-65	201105060403	water		05/05/11	X	X	X											
PC-37	201105060404	water		05/05/11	X	X	X											
PC-54	201105060405	water		05/05/11	X	X	X											
M-48A	201105060406	water		05/05/11	X	X	X											
PC-21A	201105060407	water		05/05/11	X	X	X											
M-44	201105060408	water		05/05/11	X	X	X	X										
MC-7	201105060409	water		05/05/11	X	X	X											
MC-6	201105060410	water		05/05/11	X	X	X											
MC-45	201105060411	water		05/05/11	X	X	X											
MC-53	201105060412	water		05/05/11	X	X	X											
MC-93	201105060413	water		05/05/11	X	X	X											

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Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 363960

VALIDATION SAMPLE TABLE

LDC#: 25726J

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)							
MC-29	201105060414	water		05/05/11	X	X	X								
M-48ADUP	201105060406DUP	water	DUP	05/05/11			X								
H-58AMS	201105060401MS	water	MS	05/05/11	X										
H-58AMSD	201105060401MSD	water	MSD	05/05/11	X										
PC-37MS	201105060404MS	water	MS	05/05/11	X										
PC-37MSD	201105060404MSD	water	MSD	05/05/11	X										

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364008

VALIDATION SAMPLE TABLE

LDC#: 25726K

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (60:10)	CLO ₄ (314.0)	TDS (160.1/2540C)											
M-23	201105070087	water	FD1	05/06/11	X	X	X											
MC-97	201105070088	water		05/06/11		X	X											
MC-69	201105070089	water		05/06/11		X	X											
MC-3	201105070090	water	FD2	05/06/11	X	X	X											
I-K	201105070091	water		05/06/11	X	X	X											
I-J	201105070092	water		05/06/11	X	X	X											
I-Z	201105070093	water		05/06/11	X	X	X											
I-I	201105070094	water		05/06/11	X	X	X											
I-V	201105070096	water		05/06/11	X	X	X											
I-O	201105070096	water		05/06/11	X	X	X											
I-P	201105070097	water		05/06/11	X	X	X											
I-H	201105070098	water		05/06/11	X	X	X											
I-C	201105070099	water		05/06/11	X	X	X											
I-D	201105070100	water		05/06/11	X	X	X											
I-M	201105070101	water		05/06/11	X	X	X											
I-E	201105070102	water		05/06/11	X	X	X											
I-N	201105070103	water		05/06/11	X	X	X											

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364008

VALIDATION SAMPLE TABLE

LDC#: 25726K

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (60/10)	CLO ₄ (314.0)	TDS (160.1/2540C)											
I-F	201105070104	water		05/06/11	X	X	X											
I-G	201105070105	water		05/06/11	X	X	X											
I-T	201105070106	water		05/06/11	X	X	X											
I-U	201105070107	water		05/06/11	X	X	X											
VD-1	201105070108	water	FD1	05/06/11	X	X	X											
VD-2	201105070109	water	FD2	05/06/11	X	X	X											
M-23DUP	201105070087DUP	water	DUP	05/06/11			X											
I-KDUP	201105070091DUP	water	DUP	05/06/11			X											
I-DMS	201105070100MS	water	MS	05/06/11			X											
I-DMSD	201105070100MSD	water	MSD	05/06/11			X											
VD-1MS	201105070108MS	water	MS	05/06/11	X													
VD-1MSD	201105070108MSD	water	MSD	05/06/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364096

VALIDATION SAMPLE TABLE

LDC#: 25726L

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)							
M-64	201105100003	water		05/09/11	X	X	X								
M-65	201105100004	water		05/09/11	X	X	X								
M-66	201105100005	water		05/09/11	X	X	X								
M-79	201105100006	water		05/09/11	X	X	X								
M-69	201105100007	water		05/09/11	X	X	X								
M-136	201105100008	water		05/09/11	X	X	X								
M-135	201105100009	water		05/09/11	X	X	X								
M-134	201105100010	water	FD	05/09/11	X	X	X								
M-131	201105100011	water		05/09/11	X	X	X								
M-57A	201105100012	water		05/09/11	X	X	X								
VD-3	201105100013	water	FD	05/09/11	X	X	X								
FB-2	201105100014	water	FB	05/09/11	X	X	X	X							
M-126	201105100015	water		05/09/11	X	X	X								
M-99	201105100016	water		05/09/11	X	X	X								
M-37	201105100017	water		05/09/11	X	X	X	X							
M-25	201105100018	water		05/09/11	X	X	X								
PC-135A	201105100019	water		05/09/11	X	X	X								

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Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364096

VALIDATION SAMPLE TABLE

LDC#: 25726L

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)										
PC-134A	201105100020	water		05/09/11	X	X	X											
PC-136	201105100021	water		05/09/11	X	X	X											
M-136MS	201105100008MS	water	MS	05/09/11	X													
M-136MSD	201105100008MSD	water	MSD	05/09/11	X													
M-136DUP	201105100008DUP	water	DUP	05/09/11			X											
M-135MS	201105100009MS	water	MS	05/09/11	X													
M-135MSD	201105100009MSD	water	MSD	05/09/11	X													
M-134DUP	201105100010DUP	water	DUP	05/09/11			X											
VD-3DUP	201105100013DUP	water	DUP	05/09/11			X											
FB-2MS	201105100014MS	water	MS	05/09/11				X										
FB-2MSD	201105100014MSD	water	MSD	05/09/11				X										

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364312

VALIDATION SAMPLE TABLE

LDC#: 25726M

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)											
M-92	201105110094	water		05/10/11	X	X	X											
M-97	201105110095	water		05/10/11	X	X	X											
MC-50	201105110096	water		05/10/11	X	X	X											
MC-51	201105110097	water		05/10/11	X	X	X											
M-129	201105110098	water		05/10/11	X	X	X											
M-130	201105110099	water		05/10/11	X	X	X											
CDL1-R	201105110100	water		05/10/11	X	X	X											
M-137	201105110101	water		05/10/11	X	X	X											
M-92DUP	201105110094DUP	water	DUP	05/10/11			X											
M-97MS	201105110095MS	water	MS	05/10/11	X													
M-97MSD	201105110095MSD	water	MSD	05/10/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364320

VALIDATION SAMPLE TABLE

LDC#: 25726N

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)							
M-5A	201105110140	water		05/10/11	X	X	X							
M-6A	201105110144	water		05/10/11	X	X	X							
M-7B	201105110149	water		05/10/11	X	X	X							
H-28A	201105110153	water		05/10/11	X	X	X							

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364603

VALIDATION SAMPLE TABLE

LDC#: 257260

Client ID #		Lab ID #		Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)						
Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method																
M-72		201105120484		water		05/11/11	X	X	X							
M-71		201105120485		water		05/11/11	X	X	X							
M-183		201105120486		water		05/11/11	X	X	X							
VD-5		201105120487		water	FD2	05/11/11	X	X	X							
EB-3MS		201105120471MS		water	MS	05/11/11	X			X						
EB-3MSD		201105120471MSD		water	MSD	05/11/11	X			X						
M-19MS		201105120474MS		water	MS	05/11/11	X									
M-19MSD		201105120474MSD		water	MSD	05/11/11	X									
M-68MS		201105120476MS		water	MS	05/11/11	X									
M-68MSD		201105120476MSD		water	MSD	05/11/11	X									
M-83DUP		201105120481DUP		water	DUP	05/11/11			X							

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Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364699

VALIDATION SAMPLE TABLE

LDC#: 25828C

Project Name: 2011 Annual Remedial Performance Sampling		Parameters/Analytical Method											
Citent ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)					
M-146	201105130077	water		05/12/11	X	X	X						
M-139	201105130078	water		05/12/11	X	X	X						
VD-6	201105130079	water	FD	05/12/11	X	X	X	X					
M-144DUP	201105130070DUP	water	DUP	05/12/11			X						
M-146MS	201105130077MS	water	MS	05/12/11	X								
M-146MSD	201105130077MSD	water	MSD	05/12/11	X								
M-139MS	201105130078MS	water	MS	05/12/11	X								
M-139MSD	201105130078MSD	water	MSD	05/12/11	X								

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364823

VALIDATION SAMPLE TABLE

LDC#: 25726P

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (200.7)	TDS (160.1/2540C)													
M-10	201105160047	water		05/13/11	X	X													

Shaded cells indicate sample underwent Stage 4
EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 364864

VALIDATION SAMPLE TABLE

LDC#: 25726Q

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)	Cr(VI) (7196)										
M-67	201105160267	water		05/13/11	X	X	X											
M-147	201105160268	water		05/13/11	X	X	X											
M-11	201105160269	water	FD1	05/13/11	X	X	X	X										
M-13	201105160270	water	FD2	05/13/11	X	X	X	X										
M-10	201105160271	water	FD3	05/13/11	X	X	X	X										
H-11	201105160272	water		05/13/11		X	X											
PC-148	201105160273	water		05/13/11		X	X											
PC-149	201105160275	water		05/13/11		X	X											
VD-7	201105160276	water	FD1	05/13/11	X	X	X	X										
VD-8	201105160277	water	FD2	05/13/11	X	X	X	X										
VD-9	201105160278	water	FD3	05/13/11	X	X	X	X										
M-67DUP	201105160267DUP	water	DUP	05/13/11			X											

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 365447

VALIDATION SAMPLE TABLE

LDC#: 25726R

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (60'0)	CLO ₄ (314.0)	TDS (160.1/2540C)													
PC-91	201105200186	water		05/17/11	X	X	X													
PC-97	201105200242	water		05/17/11	X	X	X													
PC-18	201105200243	water		05/19/11	X	X	X													
PC-55	201105200244	water		05/19/11	X	X	X													
PC-101R	201105200245	water		05/19/11	X	X	X													
PC-92	201105200246	water		05/17/11	X	X	X													
PC-94	201105200247	water		05/17/11	X	X	X													
PC-98R	201105200248	water		05/19/11	X	X	X													
PC-90	201105200249	water		05/17/11	X	X	X													
PC-56	201105200250	water		05/16/11	X	X	X													
PC-58	201105200251	water		05/16/11	X	X	X													
PC-59	201105200252	water		05/16/11	X	X	X													
PC-60	201105200253	water		05/16/11	X	X	X													
PC-62	201105200254	water		05/16/11	X	X	X													
PC-68	201105200255	water		05/16/11	X	X	X													
PC-122	201105200256	water		05/18/11	X	X	X													
MW-K4	201105200257	water		05/18/11	X	X	X													

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Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 365447

VALIDATION SAMPLE TABLE

LDC#: 25726R

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
ARP-1	201105200258	water		05/19/11	X	X	X											
ARP-2A	201105200259	water		05/18/11	X	X	X											
ARP-3A	201105200260	water		05/18/11	X	X	X											
ARP-4A	201105200261	water		05/18/11	X	X	X											
ARP-5A	201105200262	water		05/18/11	X	X	X											
ARP-6B	201105200263	water		05/18/11	X	X	X											
ARP-7	201105200264	water		05/18/11	X	X	X											
PC-53	201105200265	water		05/18/11	X	X	X											
PC-103	201105200266	water		05/19/11	X	X	X											
MW-K5	201105200267	water		05/18/11	X	X	X											
ARP-7B	201105200268	water		05/18/11	X	X	X											
PC-97MS	201105200242MS	water	MS	05/17/11	X													
PC-97MSD	201105200242MSD	water	MSD	05/17/11	X													
PC-92MS	201105200246MS	water	MS	05/17/11	X													
PC-92MSD	201105200246MSD	water	MSD	05/17/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 366073

VALIDATION SAMPLE TABLE

LDC#: 25726S

Client ID #		Lab ID #		Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)						
Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method															
M-121		201105270152		water		05/23/11	X	X	X						
M-118		201105270155		water		05/23/11	X	X	X						
M-103		201105270156		water		05/24/11	X	X	X						
M-117		201105270157		water		05/24/11	X	X	X						
M-120		201105270158		water		05/24/11	X	X	X						
TR-10		201105270159		water		05/24/11	X	X	X						
TR-9		201105270160		water		05/24/11	X	X	X						
TR-7		201105270161		water	FD	05/24/11	X	X	X						
TR-8		201105270162		water		05/24/11	X	X	X						
ED-1		201105270163		water	FD	05/24/11	X	X	X						
TR-5		201105270164		water		05/24/11	X	X	X						
TR-6		201105270165		water		05/24/11	X	X	X						
TR-4		201105270166		water		05/24/11	X	X	X						
M-103MS		201105270156MS		water	MS	05/24/11	X								
M-103MSD		201105270156MSD		water	MSD	05/24/11	X								
TR-10MS		201105270159MS		water	MS	05/24/11	X								
TR-10MSD		201105270159MSD		water	MSD	05/24/11	X								

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 366073		VALIDATION SAMPLE TABLE										LDC#: 25726S
Project Name: 2011 Annual Remedial Performance Sampling												
Parameters/Analytical Method												
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	ClO ₄ (314.0)	TDS (160.1/2540C)					
TR-5DUP	201105270164DUP	water	DUP	05/24/11			X					

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 366098

VALIDATION SAMPLE TABLE

LDC#: 25726T

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
M-161	201105280013	water		05/26/11	X	X	X											
M-162	201105280014	water		05/26/11	X	X	X											
M-163	201105280015	water		05/26/11	X	X	X											
M-164	201105280016	water	FD	05/26/11	X	X	X											
ED-2	201105280017	water	FD	05/26/11	X	X	X											
TR-3	201105280018	water		05/26/11	X	X	X											
TR-12	201105280019	water		05/26/11	X	X	X											
M-155	201105280020	water		05/26/11	X	X	X											
E-EB-2	201105280021	water	EB	05/26/11	X	X	X											
M-151	201105280022	water		05/26/11	X	X	X											
M-156	201105280023	water		05/25/11	X	X	X											
M-152	201105280024	water		05/25/11	X	X	X											
TR-11	201105280025	water		05/25/11	X	X	X											
M-181	201105280026	water		05/25/11	X	X	X											
M-182	201105280027	water		05/25/11	X	X	X											
E-EB-1	201105280028	water	EB	05/25/11	X	X	X											
M-150	201105280029	water		05/25/11	X	X	X											

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 366098

VALIDATION SAMPLE TABLE

LDC#: 25726T

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (60:10)	ClO ₄ (314.0)	TDS (160.1/2540C)											
M-154	201105280030	water		05/25/11	X	X	X											
TR-2	201105280031	water		05/27/11	X	X	X											
M-153	201105280032	water		05/27/11	X	X	X											
M-149	201105280033	water		05/27/11	X	X	X											
M-186	201105280034	water		05/27/11	X	X	X											
M-156DUP	201105280023DUP	water	DUP	05/25/11			X											
TR-2DUP	201105280031DUP	water	DUP	05/27/11			X											
E-EB-2MS	201105280021MS	water	MS	05/26/11	X													
E-EB-2MSD	201105280021MSD	water	MSD	05/26/11	X													
M-150MS	201105280029MS	water	MS	05/25/11		X												
M-150MSD	201105280029MSD	water	MSD	05/25/11		X												
TR-2MS	201105280031MS	water	MS	05/27/11	X													
TR-2MSD	201105280031MSD	water	MSD	05/27/11	X													

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 366585

VALIDATION SAMPLE TABLE

LDC#: 25828D

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010)	CLO ₄ (314.0)	TDS (160.1/2540C)											
EEB-3	201106040043	water	EB	06/01/11	X	X	X											
TR-1	201106040044	water	FD	06/01/11	X	X	X											
ED-3	201106040045	water	FD	06/01/11	X	X	X											
TR-IDUP	201106040044DUP	water	DUP	06/01/11			X											
ED-3DUP	201106040045DUP	water	DUP	06/01/11			X											

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 36687

VALIDATION SAMPLE TABLE

LDC#: 25726U

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC_Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/ 2540C)																					
ART-1	201106070032	water		06/06/11	X	X																					
ART-2	201106070033	water		06/06/11	X	X																					
ART-3	201106070034	water		06/06/11	X	X																					
ART-4	201106070035	water		06/06/11	X	X																					
ART-7	201106070036	water		06/06/11	X	X																					
ART-8	201106070037	water		06/06/11	X	X																					
PC-99R3	201106070038	water		06/06/11	X	X																					
PC-115R	201106070039	water		06/06/11	X	X																					
PC-116R	201106070040	water		06/06/11	X	X																					
SF-1	201106070041	water		06/06/11	X	X																					
PC-117	201106070042	water		06/06/11	X	X																					
PC-118	201106070043	water		06/06/11	X	X																					
PC-119	201106070044	water		06/06/11	X	X																					
PC-120	201106070045	water		06/06/11	X	X																					
PC-121	201106070046	water		06/06/11	X	X																					
PC-133	201106070047	water		06/06/11	X	X																					
ART-9	201106070048	water		06/06/11	X	X																					

Shaded cells indicate sample underwent Stage 4

EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate

DUP = Laboratory Duplicate, MS = Matrix Spikes, MSD = Matrix Spike Duplicate

SDG#: 366687

VALIDATION SAMPLE TABLE

LDC#: 25726U

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)												
PC-133MS	201106070047MS	water	MS	06/06/11	X													
PC-133MSD	201106070047MSD	water	MSD	06/06/11	X													

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: 367994

VALIDATION SAMPLE TABLE

LDC#: 25860A

Project Name: 2011 Annual Remedial Performance Sampling Parameters/Analytical Method

Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO ₄ (314.0)	TDS (160.1/2540C)							
PC-58	201106170021	water		06/14/11	X	X							
PC-59	201106170022	water		06/14/11	X	X							
PC-60	201106170023	water		06/14/11	X	X							
PC-62	201106170024	water		06/14/11	X	X							
PC-68	201106170025	water		06/14/11	X	X							
PC-122	201106170026	water		06/15/11	X	X							
PC-91	201106170027	water		06/14/11	X	X							
PC-97	201106170028	water		06/14/11	X	X							
PC-18	201106170029	water		06/16/11	X	X							
PC-55	201106170030	water		06/16/11	X	X							
PC-101R	201106170031	water		06/16/11	X	X							
M-83DUP	201106170016DUP	water	DUP	06/16/11		X							
PC-86DUP	201106170018DUP	water	DUP	06/14/11		X							
PC-62DUP	201106170024DUP	water	DUP	06/14/11		X							

Shaded cells indicate sample underwent Stage 4
 EB = Equipment Blank, FB = Field Blank, FD = Field Duplicate
 DUP = Laboratory Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table II. Qualification 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	due 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 III. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	Units	Validation Qualifier	Reason Code	Reason Code Definition	Qualification Finding
355326	ART-1	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0034	J	mg/L	J	bl	Laboratory Blank	0.00130 mg/L
355326	PC-115R	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0031	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-116R	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0029	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-117	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0026	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-119	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0021	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-120	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0019	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-121	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0014	J	mg/L	J	bl	Laboratory Blank	0.00055 mg/L
355326	PC-99R2/R3	2/7/2011	6010	7440-47-3	Chromium Total ICAP	0.0019	J	mg/L	J	bl	Laboratory Blank	0.00130 mg/L
364320	H-28A	5/10/2011	160.1/2540C	10-33-3	Total Dissolved Solid (TDS)	8500		mg/L	J-	h	Holding Time	8 Days
364320	M-7B	5/10/2011	160.1/2540C	10-33-3	Total Dissolved Solid (TDS)	7600		mg/L	J-	h	Holding Time	8 Days
367994	ART-7B	6/15/2011	160.1/2540C	10-33-3	Total Dissolved Solid (TDS)	8400		mg/L	J-	h	Holding Time	8 Days
364603	M-183	5/11/2011	314.0	14797-73-0	Perchlorate	1800		ug/L	J+	be	Equipment Blank	180 ug/L
364603	M-19	5/11/2011	314.0	14797-73-0	Perchlorate	930		ug/L	J+	be	Equipment Blank	180 ug/L
366098	M-150	5/25/2011	314.0	14797-73-0	Perchlorate	390		ug/L	J	id	MS/MSD RPD	19 %
366687	PC-120	6/6/2011	314.0	14797-73-0	Perchlorate	550		ug/L	J	id	MS/MSD RPD	19 %
355312	VPB-1	2/7/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.0080		mg/l	J-	h	Holding Time	27 Hours
355393	M-37	2/8/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.080		mg/l	J	m	MS/MSD %R	56.48 %
355393	VD2811	2/8/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.080		mg/l	J	m	MS/MSD %R	56.48 %
355393	VEB-1	2/8/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/l	UJ	m	MS/MSD %R	56.48 %
355771	2VD2911	2/9/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	2.9		mg/l	J-	h	Holding Time	52.25 Hours
355771	M-10	2/9/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/l	R	h	Holding Time	50.25 Hours
355771	M-11	2/9/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	2.9		mg/l	J-	h	Holding Time	52.25 Hours
355771	M-12A	2/9/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	11		mg/l	J-	h	Holding Time	52.75 Hours
355771	M-36	2/10/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	31		mg/l	J-	h	Holding Time	29.25 Hours
355771	VEB24011	2/10/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/l	UJ	h	Holding Time	31.5 Hours
363458	EB-1	5/2/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/L	R	h	Holding Time	49.25 Hours
363516	FB-1	5/3/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/L	UJ	h	Holding Time	32.75 Hours
364603	EB-3	5/11/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/L	UJ	h	Holding Time	32 Hours
364699	M-36	5/12/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	30		mg/L	J-	h	Holding Time	40.5 Hours
364699	VD-6	5/12/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	30		mg/L	J-	h	Holding Time	40.5 Hours
364864	M-10	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)		u	mg/L	R	h	Holding Time	36 Hours
364864	M-11	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	2.1		mg/L	J-	h	Holding Time	36 Hours
364864	M-13	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.028		mg/L	J	fd,h	Field Duplicate	0.132 mg/L
364864	VD-7	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	2.1		mg/L	J-	h	Holding Time	36 Hours
364864	VD-8	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.16		mg/L	J	fd,h	Field Duplicate	0.132 mg/L
											Holding Time	36 Hours

Table III. Overall Qualified Results

SDG	Client Sample ID	Sample Date	Method	Client Analyte ID	Analyte	Lab Result	Lab Qualifier	Units	Validation Qualifier	Reason Code	Reason Code Definition	Qualification Finding
364864	VD-9	5/13/2011	7196	18540-29-9	Hexavalent chromium (Cr VI)	0.078		mg/L	J	fd,h	Field Duplicate Holding Time	0.0745 mg/L 36 Hours

ATTACHMENT A

Metals Data Validation Report

Chromium by EPA SW 846 Method 6010 and EPA Method 200.7

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in these SDGs.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met for samples on which a Stage 4 review was performed.

Calibration data were not evaluated for the samples reviewed by Stage 2A criteria.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks with the following exceptions:

SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
355326	ICB/CCB	Chromium	0.00130 mg/L	ART-1 ART-2 ART-3 ART-4 ART-6 ART-7 ART-8 PC-99R2/R3
355326	ICB/CCB	Chromium	0.00055 mg/L	PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-121 PC-133

SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
355326	ICB/CCB	Chromium	0.00048 mg/L	ART-9
364699	ICB/CCB	Chromium	0.0012 mg/L	M-146
364699	ICB/CCB	Chromium	0.0008 mg/L	M-75 M-115 M-142 M-14A M-29 M-145 M-12A M-144 M-139 VD-6
364699	ICB/CCB	Chromium	0.0027 mg/L	I-Q M-22A M-36 M-38 M-2A M-76

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

SDG	Sample	Analyte	Reported Concentration	Modified Final Concentration
355326	ART-1	Chromium	0.003 mg/L	0.003J mg/L
355326	PC-99R2/R3	Chromium	0.001 mg/L	0.001J mg/L
355326	PC-115R	Chromium	0.003 mg/L	0.003J mg/L
355326	PC-116R	Chromium	0.002 mg/L	0.002J mg/L
355326	PC-117	Chromium	0.002 mg/L	0.002J mg/L
355326	PC-119	Chromium	0.002 mg/L	0.002J mg/L
355326	PC-120	Chromium	0.001 mg/L	0.001J mg/L
355326	PC-121	Chromium	0.001 mg/L	0.001J mg/L

Samples VEB-1 (from SDG 355393), VEB24011 (from SDG 355771), EB-1 (from SDG 363458), EB-2 (from SDG 363698), EB-3 (from SDG 364603), E-EB-2 (from SDG 366098), E-EB-1 (from SDG 366098), and E-EB-3 (from SDG 366585) were identified as equipment blanks. No chromium was found in this blank with the following exceptions:

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
355771	VEB24011	2/10/11	Chromium	0.004 mg/L	M-83 M-70 M-71 M-72 M-38 M-115 M-14A M-36

Samples VFB-1 (from SDG 355312), FB-1 (from SDG 363516), and FB-2 (from SDG 364096) were identified as field blanks. No chromium was found in these blanks.

Sample concentrations were compared to concentrations detected in the field blanks as required by the QAPP. No sample data was qualified.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis and criteria were met for samples on which a Stage 4 review was performed.

ICP Interference check sample analysis data were not evaluated for the samples reviewed by Stage 2A criteria.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in these SDGs.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

XI. ICP Serial Dilution

ICP serial dilution was not performed for these SDGs.

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2A criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples PC-37 and VD-2711 (from SDG 355312), samples M-37 and VD2811 (from SDG 355393), samples M-39 and VD2911 (from SDG 355771), samples M-11 and 2VD2911 (from SDG 355771), samples M-23 and VD-1 (from SDG 364008), samples MC-3 and VD-2 (from SDG 364008), samples M-134 and VD-3 (from SDG 364096), samples M-35 and VD-4 (from SDG 364063), samples M-70 and VD-5 (from SDG 364063), samples M-11 and VD-7 (from SDG 364864), samples M-13 and VD-8 (from SDG 364864), samples M-10 and VD-9 (from SDG 364864), samples M-36 and VD-6 (from SDG 364699), and samples TR-1 and ED-3 (from SDG 366585) were identified as field duplicates. No metal contaminants were detected in any of the samples with the following exceptions:

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		PC-37	VD-2711				
355312	Chromium	0.21	0.22	5 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-37	VD2811				
355393	Chromium	0.026	0.027	-	0.001 (≤0.02)	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-39	VD2911				
355771	Chromium	3.7	3.7	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-11	2VD2911				
355771	Chromium	2.9	2.9	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-23	VD-1				
364008	Chromium	0.60	0.61	2 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		MC-3	VD-2				
364008	Chromium	0.0098	0.042	-	0.03 (≤0.1)	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-134	VD-3				
364096	Chromium	0.13	0.13	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-35	VD-4				
364603	Chromium	4.2	4.4	5 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-70	VD-5				
364603	Chromium	3.8	4.8	23 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-11	VD-7				
364864	Chromium	2.4	2.4	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-13	VD-8				
364864	Chromium	0.77	0.77	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-10	VD-9				
364864	Chromium	0.74	0.82	10 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-36	VD-6				
364699	Chromium	30	30	0 (≤30)	-	-	-

SDG	Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
		TR-1	ED-3				
366585	Chromium	0.017	0.017	-	0 (≤0.02)	-	-

2011 Annual Remedial Performance Sampling

Metals - Data Qualification Summary - SDGs 355312, 355393, 355771, 355851, 356562, 363400, 363458, 363516, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, and 366585

No Sample Data Qualified in these SDGs

2011 Annual Remedial Performance Sampling

Metals - Laboratory Blank Data Qualification Summary - SDGs 355312, 355393, 355771, 355851, 356562, 363400, 363458, 363516, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, and 366585

SDG	Sample	Analyte	Modified Final Concentration	A or P
355326	ART-1	Chromium	0.003J mg/L	A
355326	PC-99R2/R3	Chromium	0.001J mg/L	A
355326	PC-115R	Chromium	0.003J mg/L	A
355326	PC-116R	Chromium	0.002J mg/L	A
355326	PC-117	Chromium	0.002J mg/L	A
355326	PC-119	Chromium	0.002J mg/L	A
355326	PC-120	Chromium	0.001J mg/L	A
355326	PC-121	Chromium	0.001J mg/L	A

2011 Annual Remedial Performance Sampling

Metals - Field Blank Data Qualification Summary – SDGs 355312, 355393, 355771, 355851, 356562, 363400, 363458, 363516, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, and 366585

No Sample Data Qualified in this SDG

ATTACHMENT B

Wet Chemistry Data Validation Report

Hexavalent Chromium by EPA SW 846 Method 7196
 Perchlorate by EPA Method 314.0
 Total Dissolved Solids by EPA Method 160.1 and Standard Method 2540C

I. Technical Holding Times

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	Flag	A or P
355312	VFB-1	Hexavalent chromium	27 hours	24 hours	J- (all detects) UJ (all non-detects)	P
355771	M-36	Hexavalent chromium	29.25 hours	24 hours	J- (all detects) UJ (all non-detects)	P
355771	VEB24011	Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	P
355771	M-10	Hexavalent chromium	50.25 hours	24 hours	J- (all detects) R (all non-detects)	P
355771	M-11 2VD2911	Hexavalent chromium	52.25 hours	24 hours	J- (all detects) R (all non-detects)	P
355771	M-12A	Hexavalent chromium	52.75 hours	24 hours	J- (all detects) R (all non-detects)	P
363458	EB-1 EB-1MS EB-1MSD	Hexavalent chromium	49.25 hours	24 hours	J- (all detects) R (all non-detects)	P
363516	FB-1	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	P
364320	M-7B H-28A	Total dissolved solids	8 days	7 days	J- (all detects) UJ (all non-detects)	P
364603	EB-3	Hexavalent chromium	32 hours	24 hours	J- (all detects) UJ (all non-detects)	P
364864	M-11 M-13 M-10 VD-7 VD-8 VD-9	Hexavalent chromium	36 hours	24 hours	J- (all detects) R (all non-detects)	P

SDG	Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
364699	M-36 VD-6	Hexavalent chromium	40.5 hours	24 hours	J- (all detects) UJ (all non-detects)	P
367994	ART-7B**	Total dissolved solids	8 days	7 days	J- (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met for samples on which a Stage 4 review was performed.

Initial calibration data were not evaluated for the samples reviewed by Stage 2A criteria.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met for samples on which a Stage 4 review was performed.

Calibration verification data were not evaluated for the samples reviewed by Stage 2A criteria.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

Samples VEB-1 (from SDG 355393), VEB24011 (from SDG 355771), EB-1 (from SDG 363458), EB-2 (from SDG 363698), EB-3 (from SDG 364603), E-EB-2 (from SDG 366098), E-EB-1 (from SDG 366098), and E-EB-3 (from SDG 366585) were identified as equipment blanks. No contaminant concentrations were found in these blanks with the following exceptions:

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
355393	VEB-1	2/8/11	Perchlorate	29 ug/L	I-O I-P I-H I-U I-T I-G I-Q I-F I-N I-E I-M I-D I-C I-S I-L I-R I-B I-AR M-65 M-66 M-79 M-69 M-57A M-99 M-131 M-135 M-25 M-37 VD2811 I-AA I-AB
355771	VEB24011	2/10/11	Perchlorate	170 ug/L	M-83 M-70 M-71 M-72 M-38 M-115 M-14A M-36
363400	EB-1	5/2/11	Perchlorate	25 ug/L	ART-1 ART-2 ART-3 ART-4 ART-6 ART-7 ART-8 PC-99R3 PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
363458	EB-1	5/2/11	Perchlorate	25 ug/L	PC-128 PC-129 PC-130 PC-131 PC-132 PC-50 PC-124 PC-125 PC-126 PC-24 PC-127 PC-86 I-R I-L I-B I-AR I-S PC-82 PC-79
363698	EB-2	5/4/11	Perchlorate	25 ug/L	AA-01 PC-137 PC-142 HMW-16 HMW-15 HMW-14 HMW-13 PC-64 PC-65 PC-66 PC-67 PC-31 PC-28 PC-107 M-96 M-95
364603	EB-3	5/11/11	Perchlorate	180 ug/L	M-77 M-148 M-31A M-52 M-141 M-35 M-19 VD-4 M-68 M-61 M-132 M-74 M-133 M-83 M-73 M-70 M-72 M-71 M-183 VD-5

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
366098	E-EB-2	5/26/11	Total dissolved solids	6 mg/L	M-161 M-162 M-163 M-164 ED-2 TR-3 TR-12 M-155 M-151
366098	E-EB-1	5/25/11	Total dissolved solids	8 mg/L	M-156 M-152 TR-11 M-181 M-182 M-150 M-154

Samples VFB-1 (from SDG 355312), FB-1 (from SDG 363516), and FB-2 (from SDG 364096) were identified as field blanks. No contaminant concentrations were found in these blanks with the following exceptions:

SDG	Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
355312	VFB-1	2/8/11	Perchlorate	8.1 ug/L	PC-123 PC-128 PC-129 PC-130 PC-131 PC-132 PC-124 PC-125 PC-126 PC-127 M-96 PC-54 PC-71 PC-72 PC-73 PC-37 M-23 M-48A M-44 M-95 VD-2711 M-64
355312	VFB-1	2/8/11	Hexavalent Chromium	0.0080 mg/L	M-44

Sample concentrations were compared to concentrations detected in the field blanks as required by the QAPP. No sample data was qualified with the following exceptions:

SDG	Sample	Analyte	Reported Concentration	Modified Final Concentration
364603	M-19	Perchlorate	930 ug/L	930J+ ug/L
364603	M-183	Perchlorate	1800 ug/L	1800J+ ug/L

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
355393	VD2811MS/MSD (M-37 VD2811 VEB-1)	Hexavalent chromium	56 (75-125)	48 (75-125)	-	J- (all detects) UJ (all non-detects)	A
366098	M-150MS/MSD (M-150)	Perchlorate	-	-	19 (≤15)	J (all detects) UJ (all non-detects)	A
366687	M-150MS/MSD (PC-120)	Perchlorate	-	-	19 (≤15)	J (all detects) UJ (all non-detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2A criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples PC-37 and VD-2711 (from SDG 355312), samples M-37 and VD2811 (from SDG 355393), samples M-39 and VD2911 (from SDG 355771), samples M-11 and 2VD2911 (from SDG 355771), samples M-23 and VD-1 (from SDG 364008), samples MC-3 and VD-2 (from SDG 364008), samples M-134 and VD-3 (from SDG 364096), samples M-35 and VD-4 (from SDG 364603), samples M-70 and VD-5 (from SDG 364603), samples M-11 and VD-7 (from SDG 364864), samples M-13 and VD-8 (from SDG 364864), samples M-10 and VD-9 (from SDG 364864), samples M-36 and VD-6 (from SDG 364699), and samples TR-1 and ED-3 (from SDG 366585) were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		PC-37	VD-2711				
355312	Total dissolved solids	7200 mg/L	7200 mg/L	0 (≤30)	-	-	-
355312	Perchlorate	340000 ug/L	350000 ug/L	3 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-37	VD2811				
355393	Total dissolved solids	4000 mg/L	4100 mg/L	2 (≤30)	-	-	-
355393	Hexavalent Chromium	0.080 mg/L	0.080 mg/L	-	0 (≤0.05)	-	-
355393	Perchlorate	1500000 ug/L	1500000 ug/L	0 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-39	VD2911				
355771	Total dissolved solids	6900 mg/L	6900 mg/L	0 (≤30)	-	-	-
355771	Perchlorate	310000 ug/L	320000 ug/L	3 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-11	2VD2911				
355771	Total dissolved solids	3100 mg/L	2700 mg/L	14 (≤30)	-	-	-
355771	Hexavalent Chromium	2.9 mg/L	2.9 mg/L	0 (≤30)	-	-	-
355771	Perchlorate	29000 ug/L	28000 ug/L	4 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-23	VD-1				
364008	Total dissolved solids	4300	4200	2 (≤30)	-	-	-
364008	Perchlorate	380000	370000	3 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		MC-3	VD-2				
364008	Total dissolved solids	17000	16000	6 (≤30)	-	-	-
364008	Perchlorate	9100	9300	2 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-134	VD-3				
364096	Total dissolved solids	2500 mg/L	2600 mg/L	4 (≤30)	-	-	-
364096	Perchlorate	110000 ug/L	110000 ug/L	0 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-35	VD-4				
364063	Total dissolved solids	4300 mg/L	4300 mg/L	0 (≤30)	-	-	-
364063	Perchlorate	160000 ug/L	150000 ug/L	6 (≤30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-70	VD-5				
364063	Total dissolved solids	4900 mg/L	6000 mg/L	20 (≤ 30)	-	-	-
364063	Perchlorate	490000 ug/L	530000 ug/L	8 (≤ 30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-11	VD-7				
364864	Hexavalent chromium	2.1 mg/L	2.1 mg/L	0 (≤ 30)	-	-	-
364864	Total dissolved solids	2700 mg/L	2800 mg/L	4 (≤ 30)	-	-	-
364864	Perchlorate	25000 ug/L	24000 ug/L	4 (≤ 30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-13	VD-8				
364864	Hexavalent chromium	0.028	0.16	-	0.132 (≤ 0.025)	J (all detects)	A
364864	Total dissolved solids	3100	3200	3 (≤ 30)	-	-	-
364864	Perchlorate	19000	20000	5 (≤ 30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-10	VD-9				
364864	Hexavalent chromium	0.0035U	0.078	-	0.0745 (≤ 0.025)	J (all detects) UJ (all non-detects)	A
364864	Total dissolved solids	2900	2900	0 (≤ 30)	-	-	-
364864	Perchlorate	21000	20000	5 (≤ 30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		M-36	VD-6				
364699	Hexavalent chromium	30 mg/L	30 mg/L	0 (≤ 30)	-	-	-
364699	Perchlorate	1700000 ug/L	1700000 ug/L	0 (≤ 30)	-	-	-
364699	Total dissolved solids	15000 mg/L	16000 mg/L	6 (≤ 30)	-	-	-

SDG	Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
		TR-1	ED-3				
366585	Total dissolved solids	700	700	0 (≤ 30)	-	-	-

2011 Annual Remedial Performance Sampling

Wet Chemistry - Data Qualification Summary - SDGs 352736, 353633, 355312, 355393, 355771, 355851, 356562, 358076, 358645, 361946, 363400, 363458, 363516, 363519, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, 366585, and 366687

SDG	Sample	Analyte	Flag	A or P	Reason
355312	VFB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
355393	M-37 VD2811 VEB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	A	Matrix spike (%R)
355771	M-36 VEB24011	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
355771	M-10 M-11 2VD2911 M-12A	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times
363458	EB-1	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times
363516	FB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
364320	M-7B H-28A	Total dissolved solids	J- (all detects) UJ (all non-detects)	P	Technical holding times
364603	EB-3	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
364864	M-11 M-13 M-10 VD-7 VD-8 VD-9	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times
364699	M-36 VD-6	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
355393	M-37 VD2811 VEB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
366098	M-150	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD)
366687	PC-120	Perchlorate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD)
364864	M-13 VD-8	Hexavalent chromium	J (all detects)	A	Field duplicates (Difference)
364864	M-10 VD-9	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

2011 Annual Remedial Performance Sampling

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDGs 352736, 353633, 355312, 355393, 355771, 355851, 356562, 358076, 358645, 361946, 363400, 363458, 363516, 363519, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, 366585, and 366687

No Sample Data Qualified in these SDGs

2011 Annual Remedial Performance Sampling

Wet Chemistry - Field Blank Data Qualification Summary - SDGs 352736, 353633, 355312, 355393, 355771, 355851, 356562, 358076, 358645, 361946, 363400, 363458, 363516, 363519, 363698, 363960, 364008, 364096, 364312, 364320, 364603, 364823, 364864, 365447, 366073, 366098, 355326, 364699, 366585, and 366687

SDG	Sample	Analyte	Modified Final Concentration	A or P
364603	M-19	Perchlorate	930J+ ug/L	A
364603	M-183	Perchlorate	1800J+ ug/L	A