# APPENDIX D ANALYTICAL DATA REVIEW MEMORANDUM





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Tronox, LLC P.O. Box 55

August 5, 2009

Henderson NV 89009

ATTN: Ms. Susan Crowley

SUBJECT: Data Validation Summary Report 2008-2009 Annual Remedial

Performance Sampling Tronox Facility Henderson, Nevada

Dear Ms. Crowley,

Data Validation Summary Report 2008-2009 Annual Remedial Performance Sampling Tronox Facility Henderson, Nevada project.

We appreciate this opportunity to support Tronox, LLC 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
July 2008 - June 2009
Annual Remedial Performance Sampling
Tronox LLC Facility
Henderson, Nevada

Prepared for

Tronox LLC Henderson, Nevada

Prepared by

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

August 5, 2009

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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

POL 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
SVOC Semivolatile Organic Compound

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 July 2008 through June 2009 Annual Remedial Performance Sampling conducted at the Tronox LLC facility in Henderson, Nevada. The assessment was performed by Tronox LLC 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 981 environmental and quality control (QC) samples. The analyses were performed by the following methods:

Chromium by EPA SW 846 Method 6010B
Wet Chemistry:
Total Dissolved Solids (TDS) by EPA Method 160.1 and Standard Method 2540C
Nitrate as Nitrogen by EPA Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
Hexavalent Chromium by EPA SW 846 Method 7196
Chlorate and Nitrate as Nitrogen by EPA SW 846 Method 9056

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/Valdiation, 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), surrogate spikes, laboratory duplicate (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- <u>Estimated</u> 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+ <u>Estimated</u> 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 <u>Estimated</u> 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 <u>Estimated/Nondetected Analyses</u> 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 maybe 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. Surrogate spikes are either isotopically labeled compounds or compounds that are not typically detected in the 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, trip 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 sample 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 exceedances can cause loss of sample constituents due to biodegradation, precipitation, volatization, 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 632 water samples were analyzed for chromium by EPA SW 846 Method 6010B. All metal data were assessed to be valid since none of the 632 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  $\geq 0.995$  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 Samples

All LCS %Rs met acceptance criteria.

# 2.1.4 Field Duplicate Samples

The field duplicate samples were evaluated for acceptable precision with RPDs for the compounds. Two chromium results were qualified as detected estimated (J) due to high RPD in field duplicate pair PC-71 and MD-4. The details regarding the qualification of results are presented in Attachment A, Section XIV.

# 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 were analyzed to evaluate representativeness.

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.

<u>Results Below the PQL</u> If a sample result and blank contaminant value were less than the PQL, the sample result was amended as non-detected (U) 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

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

#### 2.2.2. Equipment and Field Blanks

No contaminants were 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. Target compounds detected below the reporting limits flagged (J) by the laboratory should be considered estimated. The comparability of the 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 978 water samples were analyzed for TDS by EPA Method 160.1 and Standard Method 2540C and perchlorate by EPA Method 314.0; a total of 18 water samples were analyzed for nitrate as nitrogen by EPA Method 300.0; a total of 6 water samples were analyzed for nitrate/nitrite as nitrogen by EPA Method 353.2; a total of 53 water samples were analyzed for hexavalent chromium by EPA SW 846 Method 7196; a total of 26 water samples were analyzed for chlorate by EPA SW 846 Method 9056, and a total of 20 water samples were analyzed for nitrate as nitrogen by EPA SW 846 Method 9056. All wet chemistry data were assessed to be valid with the exception of two of the 2,079 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  $\geq 0.995$  and the %Rs in the continuing calibration verification met the acceptance criteria of 90-110%.

#### 3.1.2 MS/MSD Samples

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

# 3.1.3 Duplicate (DUP) Samples

Due to a high DUP RPD, the TDS result for sample PC-55 was qualified as detected estimated (J). The details regarding the qualification of results are presented in Attachment B, Section V.

### 3.1.4 LCS/LCSD Samples

Twenty results for TDS and perchlorate were qualified as detected estimated (J+) due to LCS/LCSD percent recoveries outside of the acceptance criteria. The details regarding the qualification of results are presented in Attachment B, Section VI.

# 3.1.5 Field Duplicate Samples

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

# 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 chlorate.

Due to a severe holding time criteria exceedance the nitrate as nitrogen result for sample M-10 and the hexavalent chromium result for sample EB-1 were qualified as rejected (R). Additionally, one hundred nineteen results for TDS, nitrate as nitrogen, nitrate/nitrite as nitrogen, perchlorate, and hexavalent chromium were qualified as detected estimated (J) or non-detected estimated (UJ). The analysis holding time criteria for water samples is 7 days for TDS, 48 hours for nitrate as nitrogen, 28 days for nitrate/nitrite as nitrogen and perchlorate, and 24 hours for hexavalent chromium. 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

Three results for perchlorate and hexavalent chromium were qualified as detected estimated (J+) due to contamination present in equipment blanks. The affected samples were M-5A, M-84, and M-92. The details regarding the qualification of results are presented in Attachment B, Section III.

### 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. Target compounds detected below the reporting limits flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

# 3.4 Completeness

The completeness level attained for wet chemistry field samples was 99.9 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 with the exception of TDS for sample FB-1. The laboratory reported the results as NA due to possible error in sample analysis. The details regarding the sample result are presented in Attachment B, Section VII.

#### 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, and LCS/LCSD. 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 and LCS/LCSD percent recoveries and RPDs met acceptance criteria with the exceptions noted in Sections 2.1.4, 3.1.3, and 3.1.4. 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.

#### 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 2,711 total analytes reported, 2 sample results were rejected. The completeness for the SDG is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
Metals	632	0	100
Wet Chemistry	2,079	2	99.9
Total	2,711	2	99.9

The completeness percentage based on rejected data met the 90 percent DQO goal. A less quantifiable loss of data occurred in the application of blank qualifications as specifically noted in Section 3.2.2.2.

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical data quality assessment for the water sample laboratory analytical results generated during the July 2008 through June 2009 Annual Remedial Performance Sampling at the Tronox LLC facility in Henderson, Nevada established that the overall project requirements and completeness levels were met. The 2 sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 2A 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/Valdiation, 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.

\_\_\_\_\_,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

# TABLE I

SDG#: 248147				VALID	ATION S	VALIDATION SAMPLE TABLE	# E				LDC#: 21107A	1107A
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforr	nance S	ampling	Param	ieters/An	Parameters/Analytical Method	 					
Client ID #	Lab ID #	Matrix	OC Type	Date	CLO <sub>4</sub>	TDS (160.1)						
M-87	2807180210	water		07/15/08	×	×						
PC-98R	2807180211	water		07/17/08	×	×						
PC-86	2807180212	water		07/15/08	×	×						
PC-90	2807180213	water		07/15/08	×	×						
PC-56	2807180214	water		07/14/08	×	×						
PC-58	2807180215	water		07/14/08	×	×						
PC-59	2807180216	water		07/14/08	×	×						
PC-60	2807180217	water		07/14/08	×	×						
PC-62	2807180218	water		07/14/08	×	×						
PC-68	2807180219	water		07/14/08	×	×						
PC-122	2807180220	water		07/15/08	×	×						
MW-K4	2807180221	water		07/17/08	×	×						
ARP-1	2807180222	water		07/15/08	×	×						
ARP-4A	2807180223	water		07/17/08	×	×						
ARP-5A	2807180224	water		07/11/08	×	×						
ARP-6B	2807180225	water		07/17/08	×	×						
PC-53	2807180226	water		07/17/08	×	×						
PC-103	2807180227	water		07/17/08	×	×						
Shaded cells indicate sample underwent Stage 4	underwent Stage 4											

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

SDG#: 248147				VALID.	ATION S	VALIDATION SAMPLE TABLE		LDC#: 21107A
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perform	ance Sa	ampling	Pararr	ieters/An	Parameters/Analytical Method		
Client ID #	Lab ID #	Matrix	Date Collected	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)		
MW-K5	2807180228	water		07/17/08	×	×		
PC-91	2807180229	water		07/15/08	×	×		
PC-97	2807180230	water		07/15/08	×	×		
PC-17	2807180231	water		07/15/08	×	×		
PC-18	2807180232	water		07/15/08	×	×		
PC-55	2807180233	water		07/15/08	×	×		
1-635	2807180234	water		07/16/08	×	×		
L-637	2807180235	water		07/16/08	×	×		

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

1107B																					
LDC#: 21107B																					
			TDS (160.1)	×	×	×	×	×	×	×	×	×	×			×	×	×	×	×	×
TABLE	Tothor	<b>D</b>	CLO <sub>4</sub> (314.0)	×	×	×	×	×	×	×	X	X		×		×	Į	×	×	×	×
AMPLE	T leading		Cr(VI) (7196)																		
VALIDATION SAMPLE TABLE	Darameters/Analytical Method		Cr (6010B)	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
VALID	Daran	5	Date Collected	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08	08/04/08
	pullud		QC Type (														FD1				FD2
	Janes Sal		Matrix	water																	
	Remedial Perform		Lab ID#	2808050610	2808050611	2808050612	2808050613	2808050614	2808050615	2808050616	2808050617	2808050618	2808050619	2808050620	2808050621	2808050622	2808050623	2808050624	2808050625	2808050626	2808050627
<b>SDG#</b> : 249697	Project Name: 2008 Applial Remedial Performance Sampling		Client ID #	PC-123	PC-124	PC-125	PC-126	PC-127	PC-128	PC-129	PC-130	PC-131	PC-132	M-96	PC-54	M-48	PC-71	PC-72	PC-73	PC-37	M-23

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

SDG#: 249697				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			<b>-</b>	LDC#: 21107B	)7B
Project Name: 2008 Annual Remedial Performance Sampling	I Remedial Perform	Jance S	ampling	Paran	heters/Ar	Parameters/Analytical Method	Vethod					
Client ID #	Lab ID #	Matrix	QC Tvbe	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub>	TDS (160.1)				
M-95	2808050628	water		08/04/08	×							
M-44	2808050629	water		08/04/08	×	×	×	X				
FB-1	2808050630	water	FB	08/04/08	×	×	×	×				
MD-3	2808050631	water	FD1	08/04/08	×		×	×				
MD-4	2808050632	water	FD2	08/04/08	×		×	×				
PC-124MS	2808050611MS	water	MS	08/04/08			×					
PC-124MSD	2808050611MSD	water	MSD	08/04/08			×					
PC-124DUP	2808050611DUP	water	DUP	08/04/08				×				
PC-73MS	2808050625MS	water	MS	08/04/08	×							
PC-73MSD	2808050625MSD	water	MSD	08/04/08	×							
FB-1MS	2808050630MS	water	MS	08/04/08	×	×						
FB-1MSD	2808050630MSD	water	MSD	08/04/08	×	×						
MD-3DUP	2808050631DUP	water	DUP	08/04/08				×				

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

SDG#: 249779				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				LDC#: 21107C	07C
Project Name: 2008 Annual Remedial Performance Sampling	Remedia  Perform	nance Sz	ampling	Paran	Parameters/Analytical Method	ıalytical ≬	Vethod					
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Date Cr Collected (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)		,			
M-5A	2808060296	water		08/05/08	×	×	×					
M-6A	2808060340	water		08/05/08			×					
M-7B	2808060345	water		80/02/08			×					
M-SADUP	2808060296DUP	water	DUP	08/05/08			×					

<b>SDG#:</b> 249900				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				LDC#: 21107D	1107D
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance Sa	ampling	Paran	Parameters/Analytical Method	alytical N	Tethod					
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
0-1	2808070156	water		08/02/08	×		×					
Ч-1	2808070157	water		08/02/08	×	×	×					
H	2808070158	water		08/02/08	×	×	×					
n-1	2808070159	water		08/02/08	×	×	×					
T-1	2808070160	water		08/02/08	×	×	×					
P-I	2808070161	water		08/02/08	×	×	×					
Ŏ-I	2808070162	water		08/02/08	×	×	×					
<b>Ľ</b>	2808070163	water		08/02/08	×	×	×					
N-1	2808070164	water		08/02/08	×	×	×					
프	2808070165	water		08/02/08	×	×	×					
M-1	2808070166	water		08/02/08	×	×	×					
D-1	2808070167	water		08/02/08	×	×	×					
D-I	2808070168	water		08/02/08	×	×	×					
8-1	2808070169	water		08/02/08	×	×	×					
7-	2808070170	water		08/02/08	×	×	×					
I-R	2808070171	water		08/02/08	×	×	×					
I-B	2808070172	water		08/02/08	×	×	×					
I-AR	2808070173	water		08/02/08	×	×	×					

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

<b>SDG#:</b> 249900				VALIE	MATION	SAMPLE	VALIDATION SAMPLE TABLE		LDC#: 21107D
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	nance S	ampling	Parar	neters/Ar	Parameters/Analytical Method	Method		
# CI *****!	# CI 10	) 1	i C		Cr	Date Cr CLO4 TDS	TDS		
# CI 111810	Lab ID#	Matrix	ווומוווא מכ ואמה	۱,	(00100)	(214.0)	(100.1)		
I-FDUP	2808070163DUP	water	DUP	08/02/08			×		

LDC#: 21107E																					
		-																			
			TDS (160.1)	×	×	×	×	×	×	×	×	×	×	×	×	×	×				
TABLE		/lethod	CLO <sub>4</sub> (314.0)	×	×	×	×	×	×	×	×	×	×	×	×	×	×			×	×
AMPLE		alytical N	Cr(VI) (7196)												×	×					
VALIDATION SAMPLE TABLE	,	Parameters/Analytical Method	Cr (6010B)	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
VALID,		Param	Date Collected	08/02/08	08/02/08	08/02/08	08/02/08	08/05/08	08/02/08	08/02/08	08/02/08	08/05/08	08/02/08	08/02/08	08/02/08	08/02/08	08/05/08	08/02/08	08/02/08	08/02/08	08/02/08
		buildu	QC Type C				6									EB	FD (	MS	MSD	MS	MSD
	C	ance Sar	Matrix	water	water	water	water														
		Kemedial Pertorm	Lab ID#	2808070384	2808070394	2808070395	2808070396	2808070397	2808070399	2808070400	2808070401	2808070402	2808070403	2808070404	2808070410	2808070418	2808070427	2808070384MS	2808070384MSD	2808070418MS	2808070418MSD
<b>SDG#:</b> 249949		Project Name: 2008 Annual Remedial Performance Sampling	Client ID #	I-AA	M-131	M-64	M-65	M-66	M-79	M-69	M-135	M-99	M-25	M-57A	M-37	EB-1	MD-5	I-AAMS	I-AAMSD	EB-1MS	EB-1MSD

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

<b>SDG#:</b> 250101				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				#DQT	LDC#: 21107F
Project Name: 2008 Annual Remedial Performance Sampling	Remedial Perform	nance S	ampling	Paran	Parameters/Analytical Method	alytical N	Aethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
7-1	2808080390	water		80/90/80	×		×	×				
	2808080399	water		80/90/80	×		×	×				
\ <del>.</del> 1	2808080400	water		80/90/80	×		×	×				
M-67	2808080402	water		80/90/80	×		×	×				
M-74	2808080403	water		80/90/80	×		×	×				
M-73	2808080404	water		80/90/80	×		×	×				
M-88	2808080406	water		80/90/80	×		×	×				
M-12A	2808080409	water		80/90/80	×	×	×	×				
M-11	2808080411	water	FD	80/90/80	×	×	×	×				
MD-1	2808080412	water	Ð	80/90/80	×	×	×	×				
EB-2	2808080413	water	EB	80/90/80	×	×	×	×				
EB-2MS	2808080413MS	water	MS	80/90/80		×						
EB-2MSD	2808080413MSD	water	MSD	08/06/08		×			-			

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

SDG#: 250123				VALID	ATION S	VALIDATION SAMPLE TABLE	IABLE	1		LDG#: 21107G	9
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perforn	nance Sa	ampling	Param	eters/An	Parameters/Analytical Method	ethod				
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
M-92	2808080454	water		80/90/80	×	×	×				
M-97	2808080465	water		80/90/80	×	×	×				
M-31A	2808080469	water		08/06/08	×	×	×				
M-50	2808080471	water		80/90/80	×	×	×				
M-34	2808080472	water		08/06/08	×	×	×				
M-35	2808080473	water		08/06/08	×	×	×				
M-19	2808080474	water		08/06/08	×	×	×				
M-39	2808080475	water		08/06/08	×	×	×				
M-68	2808080476	water		08/06/08	×	×	×				
M-61	2808080477	water		08/06/08	×	×	×				
¥-	2808080478	water		08/06/08	×	×	×				
?-	2808080479	water		08/06/08	×	×	×				
M-19MS	2808080474MS	water	MS	80/90/80	×						
M-19MSD	2808080474MSD	water	MSD	08/06/08	×						

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

SDG#: 250139				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			-	LDC#: 21107H	107H
Project Name: 2008 Annual Remedial Performance Sampling	ક્ષ Remedial Perforn	nance Sa	ampling	Paran	neters/An	Parameters/Analytical Method	1ethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
M-87	2808090007	water		80/20/80	×		×	×				
M-70	2808090008	water		08/02/08	×		×	×				
M-71	2808090009	water		08/02/08	×		×	×				
M-72	2808090010	water		80/20/80	×		×	×				
M-38	2808090011	water		80/20/80	×		×	×				
M-22A	2808090012	water		08/07/08	×		×	×				
M-89	2808090013	water		80/20/80	×		×	×				
M-17A	2808090014	water		08/07/08	×		×	×				
M-115	2808090015	water		80/20/80	×		×	×				
M-14A	2808090016	water		80/20/80	×		×	×				
M-36	2808090017	water		80/20/80	×	×	×	×				
M-84	2808090018	water	Œ	08/02/08	×	×	×	×				
M-10	2808090019	water		08/02/08	×	×	×	×				
MD-2	2808090020	water	FD	08/07/08	×	×	×	×				
M-100	2808090021	water		08/02/08	×	×	×	×				
M-17ADUP	2808090014DUP	water	DUP	08/02/08				×				
M-84MS	2808090018MS	water	MS	08/02/08	×	×						
M-84MSD	2808090018MSD	water	MSD	08/02/08	×	×						

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

<b>SDG#:</b> 250388				VALID	ATIONS	VALIDATION SAMPLE TABLE		LDC#: 211071
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance S	ampling	Paran	neters/Ar	Parameters/Analytical Method	Nethod	
Client ID#	Lab ID #	Matrix	QC Type	Date QC Type Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	
ART-1	2808120321	water		08/11/08	×	×	×	
ART-2	2808120323	water		08/11/08	×	×	×	
ART-3	2808120324	water		08/11/08	×	×	×	
ART-4	2808120325	water		08/11/08	×	×	×	
ART-7	2808120326	water		08/11/08	×	×	×	
ART-8	2808120327	water		08/11/08	×	×	×	
PC-99R2/R3	2808120328	water		08/11/08	×	×	×	
PC-115R	2808120329	water		08/11/08	×	×	×	
PC-116R	2808120330	water		08/11/08	×	×	×	
SF-1	2808120331	water		08/11/08	×	×	×	
PC-117	2808120332	water		08/11/08	×	×	×	
PC-118	2808120333	water		08/11/08	×	×	×	
PC-119	2808120334	water		08/11/08	×	×	×	
PC-120	2808120335	water		08/11/08	×	×	×	
PC-121	2808120336	water		08/11/08	×	×	×	
PC-133	2808120337	water		08/11/08	×	×	×	
ART-9	2808120338	water		08/11/08	×	×	×	

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

<b>SDG#:</b> 250388				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			_	LDC#: 211071	1071
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	iance Sa	ampling	Paran	าeters/An	Parameters/Analytical Method	1ethod					
Client ID#	Lab ID #	Matrix	QC Type	Date Cr CLO₄ (6010B) (314.0)	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
PC-99R2/R3DUP	2808120328DUP	water	DUP	08/11/08			×					
PC-117MS	2808120332MS	water	MS	08/11/08	×							
PC-117MSD	2808120332MSD	water	MSD	08/11/08	×							

<b>SDG#:</b> 250906				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			LDC#: 21107J
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	lance S	ampling	Paran	neters/Ar	Parameters/Analytical Method	/Jethod			
Client ID #	Lab ID #	Matrix	QC Type	Date   Cr   CLO <sub>4</sub>   TDS   Matrix   QC Type   Collected   (6010B)   (314.0)   (160.1)	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
H-28A	2808150273	water		08/13/08	×	×	×			

SDG#: 251027				VALID,	ATION S	VALIDATION SAMPLE TABLE	TABLE				IDC#:	LDC#: 21107K
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance Sa	ampling	Param	eters/An	Parameters/Analytical Method	/lethod					
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
PC-55	2808160441	water		08/11/08	×	×	×					
PC-58	2808160445	water		08/12/08	×	×	×					
PC-56	2808160446	water		08/12/08	×	×	×					
PC-60	2808160447	water		08/12/08	×	×	×					
PC-59	2808160448	water		08/12/08	×	×	×					
PC-62	2808160449	water		08/12/08	×	×	×					
PC-68	2808160450	water		08/12/08	×	×	×					
PC-97	2808160451	water		08/13/08	×	×	×					
PC-86	2808160452	water		08/13/08	×	×	×					
PC-90	2808160453	water		08/13/08	×	×	×					
PC-91	2808160454	water		08/13/08	×	×	×					
PC-17	2808160455	water		08/13/08	×	×	×					
PC-18	2808160456	water		08/13/08	×	×	×					
ARP-1	2808160457	water		08/13/08	×	×	×					
PC-134	2808160458	water		08/13/08	×	×	×					
PC-135	2808160459	water		08/13/08	×	×	×					
PC-122	2808160465	water		08/14/08	×	×	×					
ARP-6B	2808160466	water		08/14/08	×	×	×		-			

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

<b>SDG#</b> : 251027				VALID,	VALIDATION SAMPLE TABLE	AMPLE	TABLE			_	LDC#: 21107K	107K
Project Name: 2008 Annual Remedial Performance Sampling	l Remedial Perforn	nance S	ampling	Param	Parameters/Analytical Method	alytical M	[ethod					
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
ARP-5A	2808160467	water		08/14/08	×	×	×					
ARP-4A	2808160468	water		08/14/08	×	×	×					
MW-K4	2808160469	water		08/14/08	×	×	×					
MW-K5	2808160470	water		08/14/08	×	×	×					
PC-53	2808160471	water		08/14/08	×	×	×					
PC-103	2808160472	water		08/14/08	×	×	×					
PC-98R	2808160473	water		08/14/08	×	×	×					
M-87	2808160474	water		08/13/08	×	×	×					
L-635	2808160475	water		08/14/08	×	×	×					
L-637	2808160476	water		08/14/08	×	×	×					
PC-55MS	2808160441MS	water	MS	08/11/08		×						
PC-55MSD	2808160441MSD	water	MSD	08/11/08		×						
PC-55DUP	2808160441DUP	water	DUP	08/11/08			×	·				
PC-86MS	2808160452MS	water	MS	08/13/08	×							
PC-86MSD	2808160452MSD	water	MSD	08/13/08	×							
PC-18DUP	2808160456DUP	water	DUP	08/13/08			×					
MW-K4MS	2808160469MS	water	MS	08/14/08	×							
MW-K4MSD	2808160469MSD	water	MSD	08/14/08	×							

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

<b>SDG#:</b> 251181				VALII	VALIDATION SAMPLE TABLE	SAMPLE	TABLE				LDC#: 21107L	1107L
Project Name: 2008 Annual Remedial Performance Sampling	Remedial Perform	lance S	ampling	Para	Parameters/Analytical Method	nalytical I	Method					
Client ID #	Lab ID #	Matrix	Matrix QC Type	כ	Date Cr CLO <sub>4</sub> TDS	CLO <sub>4</sub> (314.0)	TDS (160.1)					
ART-6	2808190232	water		08/18/08	×	×	×					

<b>SDG#:</b> 253362				VALID	ATION S	VALIDATION SAMPLE TABLE		LDC#: 21107M	W20
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforr	nance Sai	mpling	Paran	ieters/An	Parameters/Analytical Method			
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)			
ART-1	2809090223	water		80/80/60	×	×			
ART-2	2809090224	water		80/80/60	×	×			
ART-3	2809090225	water		80/80/60	×	×			
ART-4	2809090226	water		80/80/60	×	×			
ART-6	2809090227	water		80/80/60	×	×			
ART-7	2809090228	water		80/80/60	×	×			
ART-8	2809090229	water		80/80/60	×	×			
PC-99R2/R3	2809090230	water		80/80/60	×	×			
PC-115R	2809090231	water		80/80/60	×	×			
PC-116R	2809090232	water		80/80/60	×	×			
SF-1	2809090233	water		80/80/60	×	×			
PC-117	2809090234	water		80/80/60	×	×			
PC-118	2809090235	water		80/80/60	×	×			
PC-119	2809090236	water		80/80/60	×	×			
PC-120	2809090237	water		80/80/60	×	×			
PC-121	2809090238	water		80/80/60	×	×			
PC-133	2809090239	water		80/80/60	×	×			
ART-9	2809090240	water		80/80/60	×	×			

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

<b>SDG#</b> : 253362				VALIE	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21107M	1107M
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance S	ampling	Parar	Parameters/Analytical Method	ialytical ∿	1ethod				
Client ID#	Lab ID #	Matrix	Matrix   QC Type		Date CLO <sub>4</sub> TDS collected (314.0) (160.1)	TDS (160.1)					
PC-116RDUP	2809090232DUP	water	DUP	80/80/60		×					

<b>SDG#:</b> 253834					ATION S	VALIDATION SAMPLE TABLE				LDC#: 21107N	7 (0) N (0)
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perfori	mance S	ampling	Param	eters/An	Parameters/Analytical Method					
Client ID #	Lab ID#	Matrix	40	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)		,			
M-87	2809120111	water		09/11/08	×	×					
PC-98R	2809120112	water		09/10/08	×	×					
PC-86	2809120113	water		80/60/60	×	×					
PC-90	2809120114	water		80/60/60	×	×					
PC-56	2809120115	water		80/80/60	×	×					
PC-58	2809120116	water		80/80/60	×	×					
PC-59	2809120117	water		80/80/60	×	×					
PC-60	2809120118	water		80/80/60	×	×					
PC-62	2809120119	water		80/80/60	×	×					
PC-68	2809120120	water		80/80/60	×	×					
PC-91	2809120121	water		80/60/60	×	×					
PC-97	2809120122	water		80/60/60	×	×					
PC-17	2809120123	water		80/60/60	×	×					
PC-18	2809120124	water		80/60/60	×	×					
PC-55	2809120125	water		80/60/60	×	×					
L-635	2809120126	water		80/60/60	×	×					
L-637	2809120127	water		80/60/60	×	×					
MWK-4	2809120128	water		09/10/08	×	×					

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

SDG#: 253834				VALID	ATION S	VALIDATION SAMPLE TABLE			LDC#.	LDC#: 21107N
Project Name: 2008 Annual Remedial Performance Sampling	ll Remedial Perforn	lance S	ampling	Param	eters/An	Parameters/Analytical Method	e v			
Client ID#	Lab ID #	Matrix	QC Type	Date QC Type   Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)				
ARP-1	2809120129	water		80/60/60	×	×				
ARP-4A	2809120130	water		09/10/08	×	×				
ARP-5A	2809120131	water		09/10/08	×	×				
ARP-6B	2809120131	water		09/10/08	×	×				
PC-53	2809120133	water		09/10/08	×	×				
PC-103	2809120134	wafer		09/10/08	×	×				
MWK-5	2809120135	water		09/10/08	×	×				

Project Name: 2008 Annual Remedial Performance Sampling		and the second of the Second o					たりまれている。 10 mm 1	The same of the profit of the same of the		こうして	= 5
	Remedial Perform	nance Sa	ımpling	Param	ieters/An	Parameters/Analytical Method					
Client ID #	Lab ID #	Matrix	4	Date Collected	CLO <sub>4</sub>	TDS (160.1)					
ART-1 2	2810140535			10/13/08	×	×					
ART-2 2	2810140536	water		10/13/08	×	×					
ART-3 2	2810140537	water		10/13/08	×	×					
ART-4 2	2810140538	water		10/13/08	×	×					
ART-6 2	2810140539	water		10/13/08	×	×					
ART-7	2810140540	water		10/13/08	×	×					
ART-8 2	2810140541	water		10/13/08	×	×					
PC-99R2/R3	2810140542	water		10/13/08	×	×					
PC-115R 28	2810140543	water		10/13/08	×	×					
PC-116R 28	2810140544	water		10/13/08	×	×					
SF-1	2810140546	water		10/13/08	×	×					
PC-117	2810140547	water		10/13/08	×	×					
PC-118	2810140548	water		10/13/08	×	×					
PC-119	2810140549	water		10/13/08	×	×					
PC-120	2810140550	water		10/13/08	×	×					
PC-121 28	2810140551	water		10/13/08	×	×					
PC-133	2810140552	water		10/13/08	×	×					
ART-9 28	2810140553	water		10/13/08	×	×					

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

SDG#: 256589				VALID	ATION S	VALIDATION SAMPLE TABLE	'ABLE				LDC#: 211070	1070
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perform	iance Sa	ampling	Paran	neters/An	Parameters/Analytical Method	ethod					
Client ID #	Lab ID #	Matrix	Matrix QC Type C	Date Collected	Date CLO₄	TDS (160.1)						
ART-1MS	2810140535MS	wafer	MS	10/13/08	×							
ART-1MSD	2810140535MSD	water	MSD	10/13/08	×	· · · · · · · · · · · · · · · · · · ·						
ART-1DUP	2810140535DUP	water	DUP	10/13/08		×						

<b>SDG#:</b> 257010					ATIONS	VALIDATION SAMPLE TABLE			LDC#: 21107P
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perfon	mance S	ampling	Paran	neters/Ar	Parameters/Analytical Method			
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)			
M-87	2810180021	water		10/15/08	×	×			
PC-98R	2810180022	water		10/15/08	×	×			
PC-86	2810180023	water		10/14/08	×	×			
PC-90	2810180024	water		10/14/08	×	×			
PC-56	2810180025	water		10/14/08	×	×			
PC-58	2810180026	water		10/14/08	×	×			
PC-59	2810180027	water		10/14/08	×	×			
PC-60	2810180028	water		10/14/08	×	×			
PC-62	2810180029	water		10/14/08	×	×			
PC-68	2810180030	water		10/14/08	×	×			
MW-K4	2810180031	water		10/15/08	×	×			
ARP-1	2810180032	water		10/14/08	×	×			
ARP-4A	2810180033	water		10/15/08	×	×			
ARP-5A	2810180034	water		10/15/08	×	×			
ARP-6B	2810180035	water		10/15/08	×	×			
PC-53	2810180036	water		10/15/08	×	×			
PC-103	2810180037	water		10/15/08	×	×			
MW-K5	2810180038	water		10/15/08	×	×			

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

<b>SDG#:</b> 257010		9		VALID,	ATION S.	VALIDATION SAMPLE TABLE		LDC#: 21107P	1107P
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perform	iance Sa	ımpling	Param	leters/An≀	Parameters/Analytical Method			
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub>	TDS (160.1)			
PC-91	2810180039	water		10/14/08	×	×			
PC-97	2810180040	water		10/14/08	×	×			
PC-17	2810180041	water		10/14/08	×	×			
PC-18	2810180042	water		10/14/08	×	×			
PC-55	2810180043	water		10/14/08	×	×			
L-635	2810180044	water		10/14/08	×	×			
L-637	2810180045	water		10/14/08	×	×			
PC-86MS	2810180023MS	water	MS	10/14/08	×				
PC-86MSD	2810180023MSD	water	MSD	10/14/08	×				
PC-60DUP	2810180028DUP	water	DUP	10/14/08		×			

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

<b>SDG#:</b> 258290				VALID)	ATION S	VALIDATION SAMPLE TABLE	TABLE	07Q
Project Name: 2008 Annual Remedial Performance Sampling	il Remedial Perfori	mance Sa	ampling	Param	eters/An	Parameters/Analytical Method	Vethod	
Client ID #	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)	
I-AR	2811050369	water		11/03/08	×	×	×	
0-1	2811050370	water		11/03/08	×	×	×	
d-1	2811050371	water		11/03/08	×	×	×	
포	2811050372	water		11/03/08	×	×	×	
n-i	2811050373	water		11/03/08	×	×	×	
1-1	2811050374	water		11/03/08	×	×	×	
9 <u>-</u> 1	2811050375	water		11/03/08	×	×	×	
0-1	2811050376	water		11/03/08	×	×	×	
4-	2811050377	water		11/03/08	×	×	×	
<b>Z</b> -	2811050378	water		11/03/08	×	×	×	
Ш <u>.</u>	2811050379	water		11/03/08	×	×	×	
M-1	2811050380	water		11/03/08	×	×	×	
0-1	2811050381	water		11/03/08	×	×	×	
<u> </u>	2811050382	water		11/03/08	×	×	×	
S-I	2811050383	water		11/03/08	×	×	×	
1-F	2811050384	water		11/03/08	×	×	×	
I-R	2811050385	water		11/03/08	×	×	×	
B-I	2811050386	water		11/03/08	×	×	×	

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

<b>SDG#:</b> 258290				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			#DCT	L <b>DC#:</b> 21107Q
Project Name: 2008 Annual Remedial Performance Sampling	Il Remedial Perform	iance Sa	ampling	Paran	neters/Ar	Parameters/Analytical Method	<b>Jethod</b>				
Client ID #	Lab ID #	Matrix	QC Type	Date Matrix QC Type Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
I-ARMS	2811050369MS	water	MS	11/03/08	×						
I-ARMSD	2811050369MSD	water	GSW	11/03/08	×				W		
I-ARDUP	2811050369DUP	water	dna	11/03/08			×				
SWN-I	2811050378MS	water	SM	11/03/08		×					
I-NMSD	2811050378MSD	water	MSD	11/03/08		×					

<b>SDG#</b> ; 258305				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				TDC#:	LDC#: 21107R
			ii.									
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	ampling	Paran	Parameters/Analytical Method	ialytical N	/lethod		-	_		
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
PC-123	2811050409	water		11/03/08	×		×	×				
PC-124	2811050410	water		11/03/08	×		×	×				
PC-125	2811050411	water		11/03/08	×		×	×				
PC-126	2811050412	water		11/03/08	×		×	×				
PC-127	2811050413	water		11/03/08	×		×	×				
PC-128	2811050414	water	FD	11/03/08	×		×	×				
PC-131	2811050415	water		11/03/08	×		×	×				
PC-132	2811050416	water		11/03/08	×		×	×				
FB-1	2811050417	water	FB	11/03/08	×		×	×				
M-96	2811050418	water		11/03/08	×		×	×				
PC-54	2811050419	water		11/03/08	×		×	×				
I-AA	2811050420	water		11/03/08	×		×	×				
M-66	2811050421	water		11/03/08	×		×	×				
M-65	2811050422	water		11/03/08	×		×	×				
M-64	2811050423	water		11/03/08	×		×	×				
MD-3	2811050424	water	FD	11/03/08	×		×	×				
M-95	2811050425	water		11/03/08	×	×	×	×				
PC-125DUP	2811050411DUP	water	DUP	11/03/08				×				

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

<b>SDG#:</b> 258305				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			<b>4</b>	LDC#: 21107R	07R
Project Name: 2008 Annual Remedial Performance Sampling	l Remedial Perform	lance S	guildme	Parar	Parameters/Analytical Method	nalytical I	Method					
Client ID #	Lab ID #	Matrix	Matrix   QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
FB-1MS	2811050417MS	water	MS	11/03/08	×		-					
FB-1MSD	2811050417MSD	water	MSD	11/03/08	×							
M-95MS	2811050425MS	water	MS	11/03/08		×						
M-95MSD	2811050425MSD	water	MSD	11/03/08		×						

<b>SDG#:</b> 258410					VALIDATION SAMPLE TABLE	AMPLE	TABLE				LDC#: 21107S	S/0
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	ampling	Paran	Parameters/Analytical Method	alytical N	Method					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
PC-129	2811060290	water		11/04/08	×		×	×				
PC-130	2811060291	water		11/04/08	×		×	×				
PC-71	2811060292	water	FD	11/04/08	×		×	×				
PC-72	2811060293	water		11/04/08	×		×	×				
PC-73	2811060294	water		11/04/08	×		×	×				
M-44	2811060295	water		11/04/08	×		×	×				
PC-37	2811060296	water		11/04/08	×		×	×				
M-48	2811060297	water		11/04/08	×		×	×				
MD-4	2811060298	water	FD	11/04/08	×		×	×				
M-57A	2811060299	water		11/04/08	×		×	×				
EB-1	2811060300	water	EB	11/04/08	×	×	×	×				
M-131	2811060302	water		11/04/08	×		×	×				
M-79	2811060308	water		11/04/08	×		×	×				
M-69	2811060309	water		11/04/08	×		×	×				
M-135	2811060310	water		11/04/08	×		×	×				
M-25	2811060311	water		11/04/08	×		×	×				
M-37	2811060313	water		11/04/08	×	×	×	×				
M-99	2811060314	water		11/04/08	×		×	×				

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

<b>SDG#:</b> 258410				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			LDC#: 21107S
Project Name: 2008 Annual Remedial Performance Sampling	Remedial Perform	iance Sa	ımpling	Paran	neters/An	Parameters/Analytical Method	/lethod			
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
M-44DUP	2811060295DUP	water	DUP	11/04/08				×		
M-57ADUP	2811060299DUP	water	DUP	11/04/08				×		
EB-1MS	2811060300MS	water	MS	11/04/08		×				
EB-1MSD	2811060300MSD	water	MSD	11/04/08		×				
M-131MS	2811060302MS	water	MS	11/04/08			×			
M-131MSD	2811060302MSD	water	MSD	11/04/08			×			
M-79MS	2811060308MS	water	MS	11/04/08	×					-
M-79MSD	2811060308MSD	water	MSD	11/04/08	×					

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SDG#: 258563				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE					LDC#: 21107T	T 101
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforr	nance S	ampling	Paran	neters/An	Parameters/Analytical Method	1ethod						
Client ID #	Lab ID#	Matrix	o.	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub>	TDS (160.1)					
M-92	2811070244	water		11/05/08	×		×	×					
M-97	2811070246	water		11/05/08	×		×	×					
M-31A	2811070247	water		11/05/08	×		×	×					
M-52	2811070248	water		11/05/08	×		×	×					
M-50	2811070249	water		11/05/08	×		×	×					
M-34	2811070250	water		11/05/08	×		×	×					
M-35	2811070251	water		11/05/08	×		×	×					
M-19	2811070252	water		11/05/08	×		×	×					
M-39	2811070253	water		11/05/08	×	,	×	×					
M-68	2811070254	water		11/05/08	×		×	×					
M-61	2811070255	water		11/05/08	×		×	×					
\ <del>-</del>	2811070256	water		11/05/08	×		×	×					
7	2811070257	water		11/05/08	×		×	×					
Z-I	2811070258	water		11/05/08	×		×	×					
	2811070259	water		11/05/08	×		×	×					
١-٨	2811070260	water		11/05/08	×		×	×					
M-84	2811070261	water		11/05/08	×	×	×	×			3		
M-10	2811070264	water		11/05/08	×	×	×	×					

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

<b>SDG#:</b> 258563				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21107T
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perform	iance Sa	ampling	Paran	Parameters/Analytical Method	ialytical	/ethod			
Client ID #	Lab ID #	Matrix	QC Type	Date QC Type Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
EB-2	2811070265	water	B	11/05/08	×	×		×		
M-11	2811070266	water	FD	11/05/08	×	×	×	×		
MD-1	2811070273	water	FD	11/05/08	×	×	×	×		
M-10MS	2811070264MS	water	MS	11/05/08	×					
M-10MSD	2811070264MSD	water	MSD	11/05/08	×					

<b>SDG#:</b> 258623				VALID.	ATION S	VALIDATION SAMPLE TABLE	TABLE				LDC#: 21107U	107U
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perforr	nance Sa	ampling	Param	ieters/An	Parameters/Analytical Method	[ethod					
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
M-67	2811080088	water		11/06/08	×		×	×				
M-133	2811080089	water		11/06/08	×		×	×				
M-74	2811080090	water		11/06/08	×		×	×				
M-73	2811080091	water		11/06/08	×		×	×				
M-88	2811080092	water		11/06/08	×		×	×				
M-87	2811080093	water		11/06/08	×		×	×				
M-70	2811080094	water		11/06/08	×		×	×				
M-71	2811080095	water		11/06/08	×		×	×				
M-72	2811080096	water		11/06/08	×		×	×				
M-38	2811080097	water		11/06/08	×		×	×				
M-36	2811080098	water		11/06/08	×	×	×	×				
M-12A	2811080099	water	FD	11/06/08	×	×	×	×				
M-100	2811080100	water		11/06/08	×	×	×	×				
M-22A	2811080101	water		11/06/08	×		×	×				
M-89	2811080102	water		11/06/08	×		×	×				
M-17A	2811080103	water		11/06/08	×		×	×				
MD-2	2811080104	water	FD	11/06/08	×	×	×	×				
M-70MS	2811080094MS	water	MS	11/06/08	×					-		

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

<b>SDG#:</b> 258623				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			#901	LDC#: 21107U
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	nance Sa	guildme	Param	neters/An	Parameters/Analytical Method	/lethod				
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub>	TDS (160.1)			
M-70MSD	2811080094MSD	water	MSD	11/06/08	×						
M-100MS	2811080100MS	water	MS	11/06/08		×					
M-100MSD	2811080100MSD	water	MSD	11/06/08		×					
MD-2DUP	2811080104DUP	water	DUP	11/06/08				×			

SDG#: 258639				VALID	VALIDATION SAMPLE TABLE	SAMPLE	TABLE	L <b>DC#</b> : 21107V
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	nance S	ampling	Paran	Parameters/Analytical Method	nalytical I	<b>poule</b> )	
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	
M-76	2811080129	water		11/07/08	×		×	
M-75	2811080130	water		11/07/08	×	×	×	
M-115	2811080131	water		11/07/08	×	×	×	
M-14A	2811080132	water		11/07/08	×	×	×	

SDG#: 258779				VALID.	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21107W	1107W
Project Name: 2008 Annual Remedial Performance Sampling	a Remedial Perform	mance St	ampling	Paran	Parameters/Analytical Method	alytical	Method				
Client ID#	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
ART-1	2811110250	water		11/10/08	×	×	×				
ART-2	2811110251	water		11/10/08	×	×	×				
ART-3	2811110252	water		11/10/08	×	×	×				
ART-4	2811110253	water		11/10/08	×	×	×				
ART-6	2811110254	water		11/10/08	×	×	×				
ART-7	2811110255	water		11/10/08	×	×	×				
ART-8	2811110256	water		11/10/08	×	×	×				
PC-99R2/R3	2811110257	water		11/10/08	×	×	×				
PC-115R	2811110258	water		11/10/08	×	×	×				
PC-116R	2811110259	water		11/10/08	×	×	×				
SF-1	2811110260	water		11/10/08	×	×	×				
PC-117	2811110261	water		11/10/08	×	×	×				
PC-118	2811110262	water		11/10/08	×	×	×				
PC-119	2811110263	water		11/10/08	×	×	×				
PC-120	2811110264	water		11/10/08	×	×	×				
PC-121	2811110265	water		11/10/08	×	×	×				
PC-133	2811110266	water		11/10/08	×	×	×				
ART-9	2811110267	water		11/10/08	×	×	×				

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

<b>SDG#</b> : 258779				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			9	LDC#: 21107W	3
Project Name: 2008 Annual Remedial Performance Sampling	ıl Remedial Perforn	nance Sa	ampling	Paran	neters/Ar	Parameters/Analytical Method	1ethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Cr CLO₄ TDS Matrix QC Type Collected (6010B) (314.0) (160.1)	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)					
ART-3DUP	2811110252DUP	water	DUP	11/10/08			×					
SF-1MS	2811110260MS	water	MS	11/10/08	×							
SF-1MSD	2811110260MSD	water	MSD	11/10/08	×							

<b>SDG#:</b> 259063				VALID.	VALIDATION SAMPLE TABLE	AMPLE	TABLE			#DC#	LDC#: 21107X
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance Sa	ampling	Paran	Parameters/Analytical Method	alytical N	/lethod				
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				•
M-87	2811130246	water		11/11/08	×	×	×				
PC-98R	2811130247	water		11/12/08	×	×	×				
PC-86	2811130248	water		11/11/08	×	×	×				
PC-90	2811130249	water		11/11/08	×	×	×				
PC-56	2811130250	water		11/10/08	×	×	×				
PC-58	2811130251	water		11/10/08	×	×	×				:
PC-59	2811130252	water		11/10/08	×	×	×				
PC-60	2811130253	water		11/10/08	×	×	×				
PC-62	2811130254	water		11/10/08	×	×	×				
PC-68	2811130255	water		11/10/08	×	×	×				
PC-122	2811130256	water		11/11/08	×	×	×				
MW-K4	2811130257	water		11/12/08	×	×	×				
ARP-1	2811130258	water		11/11/08	×	×	×				
ARP-4A	2811130259	water		11/12/08	×	×	×				
ARP-5A	2811130260	water		11/12/08	×	×	×				
ARP-6B	2811130261	water		11/12/08	×	×	×			-	
PC-53	2811130262	water		11/12/08	×	×	×				
PC-103	2811130263	water		11/12/08	×	×	×				

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

<b>SDG#:</b> 259063				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21107X	107X
Project Name: 2008 Annual Remedial Performance Sampling	II Remedial Perform	iance Sa	ampling	Paran	Parameters/Analytical Method	alytical I	/lethod				
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
MW-K5	2811130264	water		11/12/08	×	×	×				
PC-91	2811130265	water		11/11/08	×	×	×				
PC-97	2811130266	water		11/11/08	×	×	×				
PC-18	2811130267	water		11/11/08	×	×	×				
PC-55	2811130268	water		11/11/08	×	×	×				
L-635	2811130269	water		11/11/08	×	×	×				
L-637	2811130270	water		11/12/08	×	×	×				
PC-58DUP	2811130251DUP	water	DUP	11/10/08			×				
ARP-5AMS	2811130260MS	water	MS	11/12/08	×						
ARP-5AMSD	2811130260MSD	water	MSD	11/12/08	×						

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

<b>SDG#:</b> 261012				VALID	ATION S	VALIDATION SAMPLE TABLE		and the second		LDC#: 21107Y	≥
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	ampling	Paran	neters/Ar	Parameters/Analytical Method					
Client ID#	Lab ID#	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)					
ART-1	2812100419	water		12/08/08	×	×					
ART-2	2812100420	water		12/08/08	×	×					
ART-3	2812100421	water		12/08/08	×	×					
ART-4	2812100422	water		12/08/08	×	×					
ART-6	2812100423	water		12/08/08	×	×					
ART-7	2812100424	water		12/08/08	×	×					
ART-8	2812100425	water		12/08/08	×	×					
PC-99R2/R3	2812100426	water		12/08/08	×	×					
PC-115R	2812100427	water		12/08/08	×	×					
PC-116R	2812100428	water		12/08/08	×	×					
SF-1	2812100429	water		12/09/08	×	×					
PC-117	2812100430	water		12/08/08	×	×					
PC-118	2812100431	water		12/08/08	×	×					
PC-119	2812100432	water		12/08/08	×	×					
PC-120	2812100433	water		12/08/08	×	×					
PC-121	2812100434	water		12/08/08	×	×					
PC-133	2812100435	water		12/08/08	×	×			,		
ART-9	2812100436	water		12/08/08	×	×					
											İ

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

<b>SDG#:</b> 261012				VALID.	ATION S	VALIDATION SAMPLE TABLE				#5 <b>0</b> ]	L <b>DC#</b> : 21107Y	
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perform	nance S	ampling	Param	ieters/An	Parameters/Analytical Method	po					F-2-13
Client ID #	Lab ID #	Matrix	QC Type	Matrix QC Type Collected (314.0) (160.1)	CLO <sub>4</sub>	TDS (160.1)			 			
ART-1DUP	2812100419DUP	water	DUP	12/08/08		×						

<b>SDG#:</b> 261275				VALID	ATION S.	VALIDATION SAMPLE TABLE	LDC#: 21107Z
Project Name: 2008 Annual Remedial Performance Sampling	al Remedial Perforn	nance Sa	ampling	Param	ieters/An	Parameters/Analytical Method	
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub>	TDS (160.1)	
M-87	2812130125			12/10/08	×	×	
PC-98R	2812130126	water		12/11/08	×	×	
PC-86	2812130127	water		12/09/08	×	×	
PC-90	2812130128	water		12/09/08	×	×	
PC-56	2812130129	water		12/08/08	×	×	
PC-58	2812130130	water		12/08/08	×	×	
PC-59	2812130131	water		12/08/08	×	×	
PC-60	2812130132	water		12/08/08	×	×	
PC-62	2812130133	water		12/08/08	×	×	
PC-68	2812130134	water		12/08/08	×	×	
PC-122	2812130135	water		12/08/08	×	×	
MW-K4	2812130136	water		12/11/08	×	×	
ARP-1	2812130137	water		12/09/08	×	×	
ARP-4A	2812130138	water		12/11/08	×	×	
ARP-5A	2812130139	water		12/11/08	×	×	
ARP-6B	2812130140	water		12/11/08	×	×	
ARP-7	2812130141	water		12/09/08	×	×	
PC-53	2812130142	water		12/11/08	×	×	

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

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SDG#: 261275				VALID	ATION S	VALIDATION SAMPLE TABLE		=	LDC#: 21107Z	7,
Project Name: 2008 Annual Remedial Performance Sampling	a Remedial Perform	nance Sa	ampling	Paran	neters/An	Parameters/Analytical Method				
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)				
PC-103	2812130143	water		12/11/08	×	×				
MW-K5	2812130144	water		12/11/08	×	×				
PC-91	2812130145	water		12/09/08	×	×				
PC-97	2812130146	water		12/09/08	×	×				
PC-17	2812130147	water		12/09/08	×	×				
PC-18	2812130148	water		12/09/08	×	×				
PC-55	2812130149	water		12/10/08	×	×				
T-635	2812130150	water		12/10/08	×	×				
L-637	2812130151	water		12/10/08	×	×				

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

SDG#: 263577				VALID,	ATION S	VALIDATION SAMPLE TABLE	LDC#: 21040A
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplin	<u>o</u>	Param	ieters/An	Parameters/Analytical Method	
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)	
M-87	2901160237	water		01/14/09	$\vdash$	×	
PC-98R	2901160239	water		01/15/09	×	×	
PC-86	2901160240	water		01/13/09	×	×	
PC-90	2901160241	water		01/13/09	×	×	
PC-56	2901160242	water		01/12/09	×	×	
PC-58	2901160243	water		01/12/09	×	×	
PC-59	2901160244	water		01/12/09	×	×	
PC-60	2901160245	water		01/12/09	×	×	
PC-62	2901160246	water		01/12/09	×	×	
PC-68	2901160247	water		01/12/09	×	×	
PC-122	2901160248	water		01/13/09	×	×	
MW-K4	2901160249	water		01/15/09	×	×	
ARP-1	2901160250	water		01/14/09	×	×	
ARP-4A	2901160251	water		01/15/09	×	×	
ARP-5A	2901160252	water		01/15/09	×	×	
ARP-6B	2901160253	water		01/15/09	×	×	
ARP-7	2901160254	water		01/13/09	×	×	
PC-53	2901160255	water		01/15/09	×	×	

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

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SDG#: 263577				VALID	ATION S	VALIDATION SAMPLE TABLE	LDC#: 21040A
Project Name: Annual Remedial Performance Sampling	redial Performance	Samplir	<u>)</u>	Paran	าeters/An	Parameters/Analytical Method	
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)	
PC-103	2901160256	water		01/15/09	×	×	
MW-K5	2901160257	water		01/15/09	×	×	
PC-91	2901160258	water		01/13/09	×	×	
PC-97	2901160259	water		01/13/09	×	×	
PC-17	2901160260	water		01/13/09	×	×	
PC-18	2901160261	water		01/14/09	×	×	
PC-55	2901160262	water		01/14/09	×	×	
L-635	2901160263	water		01/14/09	×	×	
L-637	2901160264	water		01/14/09	×	×	
M-87DUP	2901160237DUP	water	DUP	01/14/09		×	

<b>SDG#:</b> 264580				VALID	VALIDATION SAMPLE	AMPLE	TABLE				LDC#: 21040B	740B
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	තු	Paran	Parameters/Analytical Method	alytical N	(ethod					
Client ID#	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
PC-123	2902030358	water		02/02/09	×		×	×				
PC-124	2902030359	water		02/02/09	×		×	×				
PC-125	2902030360	water		02/02/09	×		×	×				
PC-126	2902030361	water		02/02/09	×		×	×				
PC-127	2902030362	water		02/02/09	×		×	×				
PC-128	2902030363	water		02/02/09	×		×	×				
PC-129	2902030364	water		02/02/09	×		×	×				
PC-130	2902030365	water		02/02/09	×		×	×				
PC-131	2902030366	water		02/02/09	×		×	×				
PC-132	2902030367	water		02/02/09	×		×	×				
M-96	2902030368	water		02/02/09	×		×	×				
PC-54	2902030369	water		02/02/09	×		×	×				
M-48	2902030370	water		02/02/09	×		×	×				
M-44	2902030371	water		02/02/09	×		×	×				
PC-71	2902030372	water		02/02/09	×		×	×				
PC-72	2902030373	water		02/02/09	×		×	×				
PC-73	2902030374	water		02/02/09	×		×	×				
PC-37	2902030375	water	FD2	02/02/09	×		×	×				

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

<b>SDG#</b> : 264580				VALID	VALIDATION SAMPLE TABLE	AWPLE	TABLE			LDC#: 21040B	040B
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplii	ງຕີ	Paran	Parameters/Analytical Method	ialytical	<b>Tethod</b>				
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
M-95	2902030376	water	FD1	02/05/09	×	×	×	×			
MD-1	2902030385	water	FD1	02/05/09	×	×	×	×			
MD-3	2902030387	water	FD2	02/05/09	×		×	×			
FB-1	2902030388	water	FB	02/02/09	×	×	×				
PC-123DUP	2902030358DUP	water	dna	02/05/09				×			
M-48MS	2902030370MS	water	SIM	02/05/09	×						
M-48MSD	2902030370MSD	water	MSD	02/02/09	×						
FB-1MS	2902030388MS	water	MS	02/05/09	×	×					
FB-1MSD	2902030388MSD	water	GSW	02/02/09	×	×					

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

Project Name: Annual Remedial Performance Sampling         Parameteris/Analytical Method           ART-1         Lab ID #         Marrix         Oct Type         Collect (Bord)         (344.0)         TDS           ART-1         2902030440         water         020209         X         X         X           ART-3         2902030443         water         020209         X         X         X           ART-4         2902030444         water         020209         X         X         X           ART-5         2902030445         water         020209         X         X         X           ART-6         2902030445         water         020209         X         X         X           ART-7         2902030445         water         020209         X         X         X           ART-8         2902030445         water         020209         X         X         X           ART-9         2902030449         water         020209         X         X         X           PC-115R         2902030449         water         020209         X         X         X           PC-116R         2902030449         water         020209         X         X	<b>SDG#:</b> 264598				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21040C	1040C
Client ID # Lab ID # Matrix QC Type Collected (6010B) (314.0)  2902030440 water 02/02/09 X X X 2902030445 water 02/02/09 X X X X 2902030445 water 02/02/09 X X X X 2902030446 water 02/02/09 X X X X X X X X X X X X X X X X X X X	Project Name: Annual Rem	nedial Performance	e Samplir	ם	Paran	eters/An	alytical N	fethod				
2902030440         water         02/02/09         X         X           2902030443         water         02/02/09         X         X           2902030444         water         02/02/09         X         X           2902030445         water         02/02/09         X         X           2902030446         water         02/02/09         X         X           2902030446         water         02/02/09         X         X           RR         2902030446         water         02/02/09         X         X           RR         2902030446         water         02/02/09         X         X           RR         2902030448         water         02/02/09         X         X           RR         2902030450         water         02/02/09         X         X           RR         2902030451         water         02/02/09         X         X           D         2902030455         water         02/02/09         X         X           D         2902030456         water         02/02/09         X         X           D         2902030456         water         02/02/09         X         X	Client ID#	Lab ID#	Matrix	QC Type	Date Collected			TDS (160.1)				
2902030442       water       02/02/09       X       X         2902030443       water       02/02/09       X       X         2902030444       water       02/02/09       X       X         2902030445       water       02/02/09       X       X         2902030446       water       02/02/09       X       X         RR       2902030447       water       02/02/09       X       X         RR       2902030448       water       02/02/09       X       X         RR       2902030450       water       02/02/09       X       X         R       2902030451       water       02/02/09       X       X         R       2902030452       water       02/02/09       X       X         R       2902030454       water       02/02/09       X       X         R       2902030455       water       02/02/09       X       X         R       2902030456       water       02/02/09       X       X         R       2902030456       water       02/02/09       X       X         R       2902030457       water       02/02/09       X       X	ART-1	2902030440	water		02/02/09		-	×				
2902030443       water       02/02/09       X       X         2902030444       water       02/02/09       X       X         2902030445       water       02/02/09       X       X         2902030446       water       02/02/09       X       X         RR       2902030448       water       02/02/09       X       X         RR       2902030450       water       02/02/09       X       X         RR       2902030451       water       02/02/09       X       X         R       2902030452       water       02/02/09       X       X         R       2902030454       water       02/02/09       X       X         R       2902030455       water       02/02/09       X       X         R       2902030456       water       02/02/09       X       X         R       2902030458       water       02/02/09       X       X	ART-2	2902030442	water		02/02/09	×	×	×				
2902030444     water     02/02/09     X     X       2902030445     water     02/02/09     X     X       2902030446     water     02/02/09     X     X       R     2902030447     water     02/02/09     X     X       RR     2902030448     water     02/02/09     X     X       RR     2902030450     water     02/02/09     X     X       R     2902030451     water     02/02/09     X     X       R     2902030452     water     02/02/09     X     X       R     2902030453     water     02/02/09     X     X       R     2902030456     water     02/02/09     X     X       R     2902030457     water     02/02/09     X     X       R     2902030457     water     02/02/09     X     X	ART-3	2902030443	water		02/02/09	×	×	×				
2902030445       water       02/02/09       X       X         2902030446       water       02/02/09       X       X         220C2030447       water       02/02/09       X       X         RR       2902030448       water       02/02/09       X       X         RR       2902030449       water       02/02/09       X       X         RR       2902030450       water       02/02/09       X       X         RR       2902030451       water       02/02/09       X       X         R       2902030452       water       02/02/09       X       X         R       2902030453       water       02/02/09       X       X         R       2902030455       water       02/02/09       X       X         R       2902030456       water       02/02/09       X       X         R       2902030457       water       02/02/09       X       X         R       2902030457       water       02/02/09       X       X         R       2902030457       water       02/02/09       X       X	ART-4	2902030444	water		02/02/09	×	×	×				
2902030446         water         02/02/09         X         X           22P02030447         water         02/02/09         X         X           72PR3         2902030448         water         02/02/09         X         X           1R         2902030449         water         02/02/09         X         X           1R         2902030451         water         02/02/09         X         X           1         2902030452         water         02/02/09         X         X           1         2902030453         water         02/02/09         X         X           1         2902030456         water         02/02/09         X         X           2         2902030458         water         02/02/09         X         X	ART-6	2902030445	water		02/02/09	×	×	×				
REAL     2902030447     water     02/02/09     X     X       SIR     2902030448     water     02/02/09     X     X       SIR     2902030450     water     02/02/09     X     X       SIR     2902030451     water     02/02/09     X     X       SIR     2902030452     water     02/02/09     X     X       SIR     2902030453     water     02/02/09     X     X       SIR     2902030454     water     02/02/09     X     X       SIR     2902030456     water     02/02/09     X     X       SIR     2902030456     water     02/02/09     X     X       SIR     2902030457     water     02/02/09     X     X       SIR     2902030457     water     02/02/09     X     X       SIR     2902030457     water     02/02/09     X     X	ART-7	2902030446	water		02/02/09	×	×	×				
REALES         2902030448         water         02/02/09         X         X           IR         2902030449         water         02/02/09         X         X           IR         2902030450         water         02/02/09         X         X           IR         2902030451         water         02/02/09         X         X           IR         2902030452         water         02/02/09         X         X           IR         2902030453         water         02/02/09         X         X           IR         2902030454         water         02/02/09         X         X           IR         2902030455         water         02/02/09         X         X           IR         2902030456         water         02/02/09         X         X           IR         2902030457         water         02/02/09         X         X           IR         2902030458         water         02/02/09         X         X	ART-8	2902030447	water		02/02/09	×	×	×				
IR         2902030449         water         02/02/09         X         X           IR         2902030450         water         02/02/09         X         X           2902030451         water         02/02/09         X         X           2902030452         water         02/02/09         X         X           2902030454         water         02/02/09         X         X           2902030455         water         02/02/09         X         X           2902030456         water         02/02/09         X         X           2902030456         water         02/02/09         X         X           2902030457         water         02/02/09         X         X           2902030457         water         02/02/09         X         X	PC-99R2/R3	2902030448	water		02/02/09	×	×	×				
R         2902030450         water         02/02/09         X         X           2902030451         water         02/02/09         X         X           2902030452         water         02/02/09         X         X           2902030453         water         02/02/09         X         X           2902030454         water         02/02/09         X         X           2902030455         water         02/02/09         X         X           2902030456         water         02/02/09         X         X           2902030457         water         02/02/09         X         X           2902030458         water         02/02/09         X         X	PC-115R	2902030449	water		02/02/09	×	×	×				
2902030451       water       02/02/09       X       X         2902030452       water       02/02/09       X       X         2902030453       water       02/02/09       X       X         2902030454       water       02/02/09       X       X         2902030455       water       02/02/09       X       X         2902030456       water       02/02/09       X       X         2902030457       water       02/02/09       X       X         2902030458       water       02/02/09       X       X	PC-116R	2902030450	water		02/02/09	×	×	×				
2902030452       water       02/02/09       X       X         2902030453       water       02/02/09       X       X         2902030454       water       02/02/09       X       X         2902030455       water       02/02/09       X       X         2902030456       water       02/02/09       X       X         2902030457       water       02/02/09       X       X         2902030458       water       02/02/09       X       X	SF-1	2902030451	water		02/02/09	×	×	×				
2902030453       water       02/02/09       X       X         2902030454       water       02/02/09       X       X         2902030455       water       02/02/09       X       X         2902030456       water       02/02/09       X       X         2902030457       water       02/02/09       X       X         2902030458       water       02/02/09       X       X	PC-117	2902030452	water		02/02/09	×	×	×				
2902030454       water       02/02/09       X       X         2902030455       water       02/02/09       X       X         2902030456       water       02/02/09       X       X         2902030457       water       02/02/09       X       X         2902030458       water       02/02/09       X       X	PC-118	2902030453	water		02/02/09	×	×	×				
2902030455       water       02/02/09       X       X         2902030456       water       02/02/09       X       X         2902030457       water       02/02/09       X       X         2902030458       water       02/02/09       X       X	PC-119	2902030454	water		02/02/09	×	×	×				
2902030456 water 02/02/09 X X X 202030457 water 02/02/09 X X X X X	PC-120	2902030455	water		02/02/09	×	×	×				
2902030457 water 02/02/09 X X X 2902030458 water 02/02/09 X X	PC-121	2902030456	water		02/02/09	×	×	×				
2902030458 water 02/02/09 X X	PC-133	2902030457	water		02/02/09	×	×	×				
	ART-9	2902030458	water		02/02/09	×	×	×				

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

<b>SDG#:</b> 264598				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				LDC#: 21040C	40C
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	<u>g</u>	Paran	Parameters/Analytical Method	alytical N	/Jethod					
Clent ID #	Lab ID#	Matrix	QC Type	Date   Cr   CLO <sub>4</sub>   TDS   Matrix   QC Type   Collected   (6010B)   (314.0)   (160.1)	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
SF-1DUP	2902030451DUP	water	DUP	05/05/09			×					

SDG#: 264727				VALID.	VALIDATION SAMPLE TABLE	AMPLE	TABLE			DOT	LDC#: 21040D	00
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	J D	Param	Parameters/Analytical Method	alytical N	/lethod					
Client ID #	Lab ID#	Matrix	C Type	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)					
0-1	2902050032	water		05/03/09	×		×					
d-1	2902050034	water		02/03/08	×	×	×					
프	2902050035	water		02/03/09	×	×	×					
l-U	2902050036	water		02/03/09	×	×	×					
<u>L</u> -	2902050037	water		02/03/09	×	×	×					
9-I	2902050038	water		02/03/09	×	×	×					
P-0	2902050039	water		02/03/09	×	×	×					
<b>Ľ</b>	2902050040	water		05/03/09	×	×	×					
<b>V</b> -	2902050041	water		02/03/09	×	×	×					
3-	2902050042	water		02/03/09	×	×	×					
M-1	2902050043	water		02/03/09	×	×	×					
Q-1	2902050044	water		02/03/09	×	×	×					
J-I	2902050045	water		02/03/09	×	×	×					
S-1	2902050046	water		02/03/09	×	×	×					
<u>۲</u>	2902050047	water		02/03/09	×	×	×					
1-1	2902050048	water		02/03/08	×	×	×					
I-B	2902050049	water		02/03/09	×	×	×					
I-AR	2902050050	water		02/03/09	×	×	×					

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

SDG#: 264727				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			: LDC#:	LDC#: 21040D
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplin	<u> </u>	Paran	neters/Ar	Parameters/Analytical Method	/lethod				A continued to
Client ID #	Lab ID #	Matrix	Matrix   QC Type   Co	Date Collected	Date Cr Ollected (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
I-PDUP	2902050034DUP	water	DUP	02/03/09			×				
I-BMS	2902050049MS	water	MS	02/03/09	×						
I-BMSD	2902050049MSD	water	MSD	02/03/09	×						

SDG#: 264774				VALID	VALIDATION SAMPLE TABLE	AMPLE .	TABLE				3 <u>0</u> 7	LDC#: 21040E	90E
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	තු	Paran	Parameters/Analytical Method	alytical N	<b>1</b> ethod						
Client ID #	Lab ID #	Matrix	QC Tvbe	o B	Cr (6010B)	Cr(VI)		TDS (160.1)					
I-AA	2902050191	_			+	-	1	×					
M-64	2902050199	water		02/03/09	×		×	×					
M-65	2902050200	water		02/03/09	×		×	×					
M-66	2902050201	water		02/03/09	×		×	×					
M-79	2902050202	water		02/03/09	×		×	×					
M-69	2902050203	water		02/03/09	×		×	×					
M-135	2902050204	water		02/03/09	×		×	×					
M-131	2902050205	water		02/03/09	×		×	×					
M-57A	2902050206	water		02/03/09	×		×	×					
M-99	2902050207	water		02/03/09	×		×	×					
M-25	2902050208	water	FD	02/03/09	×		×	×					
M-37	2902050209	water		02/03/09	×	×	×	×					
MD-4	2902050210	water	Ð	02/03/09	×		×	×					
EB-1	2902050211	water	EB	02/03/09	×	×	×	×					
I-AADUP	2902050191DUP	water	DUP	02/03/09				×					
M-135MS	2902050204MS	water	MS	02/03/09	×								
M-135MSD	2902050204MSD	water	MSD	02/03/09	×								
EB-1MS	2902050211MS	water	MS	02/03/09		×	×						

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

SDG#: 264774	in the second se			VALID	VALIDATION SAMPLE TABLE	MPIE	TABLE				DC#: 04040F	IONOE
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samulii	-	Paran	Parameters/Analytical Method	T Solvior	/ethod					
			D	5		מ אל פול פול פול פול פול פול פול פול פול פו						
				Date	ပ်	Cr(VI)	CLO4	TDS			 	
Client ID #	Lab ID #	Matrix	QC Type	Matrix   QC Type   Collected   (6010B)	(6010B)	(7196) (314.0) (160.1)	(314.0)	(160.1)		 	 	
EB-1MSD	2902050211MSD	water	MSD	02/03/09		×	×		-			

<b>SDG#:</b> 264820					VALIDATION SAMPLE TABLE	AMPLE	TABLE				FOGT	LDC#: 21040F
Project Name: Annual Remedial Performance Sampling	nedial Performance	e Sampli	DO	Paran	Parameters/Analytical Method	alytical N	/lethod					
Client ID #	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI)	CLO <sub>4</sub>	TDS (160.1)				
M-92	2902050371	water		02/04/09	×		×	×				
M-97	2902050372	water		02/04/09	×		×	×	·			
M-31A	2902050373	water		02/04/09	×		×	×				
M-52	2902050374	water		02/04/09	×		×	×				
M-50	2902050375	water		02/04/09	×		×	×				
M-34	2902050376	water		02/04/09	×		×	×				
M-35	2902050377	water		02/04/09	×		×	×				
M-19	2902050378	water		02/04/09	×		×	×				
M-39	2902050379	water		02/04/09	×		×	×				
M-68	2902050380	water		02/04/09	×		×	×				
M-61	2902050381	water		02/04/09	×		×	×				
M-67	2902050382	water		02/04/09	×		×	×				
M-74	2902050383	water		02/04/09	×		×	×				
M-73	2902050384	water		02/04/09	×		×	×				
M-88	2902050385	water		02/04/09	×		×	×				
N-1	2902050386	water		02/04/09	×		×	×				
<del>*-</del>	2902050387	water		02/04/09	×		×	×				
f-I	2902050388	water		02/04/09	×		×	×		 		
											-	

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

<b>SDG#:</b> 264820				VALID,	ATION S	VALIDATION SAMPLE TABLE	TABLE			<b>LDC#:</b> 21040F	10F
Project Name: Annual Remedial Performance Sampling	iedial Performance	Samplir	<u>[</u> 0	Param	ieters/An	Parameters/Analytical Method	Method				
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
7-1	2902050389	water		02/04/09	×		×	×			
1-1	2902050390	water		02/04/09	×		×	×			
M-12A	2902050393	water		02/04/09	×	×	×	×			
EB-2	2902050394	water	EB	02/04/09	×	×	×	×			
M-10	2902050395	water		02/04/09	×	×	×	×			
M-92DUP	2902050371DUP	water	DUP	02/04/09				×			
M-97MS	2902050372MS	water	MS	02/04/09			×				
M-97MSD	2902050372MSD	water	MSD	02/04/09			×				
EB-2MS	2902050394MS	water	MS	02/04/09	×	×					
EB-2MSD	2902050394MSD	water	MSD	02/04/09	×	×					

<b>3004.</b> 204840				VALID	A CN	WALLEYALLON SYAMPETER VALSEE	ABLE			<b>LDC#</b> : 21040G	040G
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplii	<u> </u>	Paran	ieters/An	Parameters/Analytical Method	/lethod				
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub>	TDS (160.1)			
M-87	2902070062	water		02/02/09	×		×	×			
M-70	2902070063	water		02/02/09	×		×	×			
M-71	2902070064	water		02/02/09	×		×	×			
M-72	2902070065	water		02/02/09	×		×	×			
M-22A	2902070066	water		02/02/09	×		×	×			
M-38	2902070067	water		02/02/09	×		×	×			
M-89	2902070068	water		02/02/09	×		×	×			
M-100	2902070069	water		02/02/09	×	×	×	×			
M-84	2902070070	water	FD	02/02/09	×	×	×	×			
M-36	2902070071	water		02/02/09	×	×	×	×			
M-11	2902070072	water		02/02/09	×	×	×	×			
MD-2	2902070073	water	Ð	02/02/09	×	×	×	×			
M-87DUP	2902070062DUP	water	DUP	02/02/09				×			

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

<b>SDG#:</b> 264958				VALID	ATION	VALIDATION SAMPLE TABLE	TABLE			LDC#:	LDC#: 21040H
Project Name: Annual Remedial Performance Sampling	iedial Performance	Samplir	ຼີດ	Paran	neters/Aı	Parameters/Analytical Method	/lethod				
Client ID #	Lab ID #	Matrix	Date Collected	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	 -	:		
M-17A	2902070090	water		05/06/09	×	×	×				
M-76	2902070091	water		02/06/09	X	×	×				
M-75	2902070092	water		05/06/09	×	×	×				
M-115	2902070093	water		02/06/09	×	×	×				
M-14A	2902070094	water		02/06/09	×	×	×				
M-115MS	2902070093MS	wafer	MS	02/06/09		×					
M-115MSD	2902070093MSD	water	MSD	02/06/09		×					

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SDG#: 265481				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE		LDC#: 21040l
Project Name: Annual Remedial Performance Sampling	medial Performanc	e Sampliı	DU DU	Paran	neters/Ar	Parameters/Analytical Method	/lethod		
Client ID #	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
MW-K4	2902140029	water		02/11/09	×	×	×		
ARP-1	2902140030	water		02/11/09	×	×	×		
ARP-4A	2902140031	water		02/11/09	×	×	×		
ARP-5A	2902140032	water		02/11/09	×	×	×		
ARP-6B	2902140033	water		02/11/09	×	×	×		
PC-53	2902140034	water		02/11/09	×	×	×		
PC-103	2902140035	water		02/11/09	×	×	×		
MW-5K	2902140036	water		02/11/09	×	×	×		
M-87	2902140037	water		02/11/09	×	×	×		
PC-98R	2902140038	water		05/11/09	×	×	×		
PC-86	2902140039	water		02/10/09	×	×	×		
PC-90	2902140040	water		02/10/09	×	×	×		
PC-56	2902140041	water		05/09/09	×	×	×		
PC-58	2902140042	water		60/60/20	×	×	×		
PC-59	2902140043	water		02/09/09	×	×	×		
PC-60	2902140044	water		05/09/09	×	×	×		
PC-62	2902140045	water		05/09/09	×	×	×		
PC-68	2902140046	water		05/09/09	×	×	×		

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

SDG#: 265481				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE		LDC#: 21040l	401
Project Name: Annual Remedial Performance Sampling	edial Performance	Samplir	6	Paran	Parameters/Analytical Method	alytical N	lethod			
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
PC-91	2902140047	water		05/10/09	×	×	×		-	
PC-97	2902140048	water		02/10/09	×	×	×			
PC-18	2902140049	water		02/10/09	×	×	×			
PC-55	2902140050	water		02/10/09	×	×	×			
L-635	2902140051	water		02/12/09	×	×	×			
L-637	2902140052	water		02/12/09	×	×	×			
MW-K4MS	2902140029MS	water	MS	02/11/09	×					
MW-K4MSD	2902140029MSD	water	MSD	02/11/09	×					
ARP-5ADUP	2902140032DUP	water	DUP	02/11/09			×			
PC-103DUP	2902140035DUP	water	DUP	02/11/09			×			
PC-98RMS	2902140038MS	water	MS	02/11/09	×					
PC-98RMSD	2902140038MSD	water	MSD	02/11/09	×					

<b>SDG#:</b> 265658				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			#30]	LDC#: 21040J
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	<b>)</b> (	Paran	าeters/An	Parameters/Analytical Method	Aethod				
Client ID #	Lab ID #	Matrix	Matrix   QC Type   Co	Date Collected	Cr (6010B)	Date Cr CLO <sub>4</sub> TDS collected (6010B) (314.0) (160.1)	TDS (160.1)				
M-23	2902180119	water		02/17/09 X	×	×	×				

<b>SDG#:</b> 266452				VALID	ATION S	VALIDATION SAMPLE TABLE		) <u>a</u>	LDC#: 21040K
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	ĵĝ	Paran	eters/Ar	Parameters/Analytical Method			
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)			
ART-1	29063030142	water		03/02/09	×	×			
ART-2	29063030143	water		03/05/09	×	×			
ART-3	29063030144	water		03/05/09	×	×			
ART-4	29063030145	water		03/02/09	×	×			
ART-7	29063030146	water		03/02/09	×	×			
PC-99R2/R3	29063030147	water		03/02/09	×	×			
PC-115R	29063030148	water		03/02/09	×	×			
PC-116R	29063030149	water		03/02/09	×	×			
SF-1	29063030150	water		03/02/09	×	×			
PC-117	29063030151	water		03/02/09	×	×			
PC-118	29063030152	water		03/02/09	×	×			
PC-119	29063030153	water		03/05/09	×	×			
PC-120	29063030154	water		03/02/09	×	×			
PC-121	29063030155	water		03/02/09	×	×			
PC-133	29063030156	water		03/02/09	×	×			
ART-9	29063030157	water		03/05/09	×	×			

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

SDG#: 267194					ATION S	VALIDATION SAMPLE TABLE	Ш			DC#	LDC#: 210401
Project Name: Annual Remedial Performance Sampling	nedial Performanc	e Samplir	ງດ	Paran	neters/An	Parameters/Analytical Method	•				
					CLO,	TDS	Of The Control of the				
Client ID #	Lab ID #	Matrix	QC Type	~ I		(160.1)					
IN-8/	2903120180	water		03/11/09	×	×					
PC-98R	2903120181	water		03/11/09	×	×					
PC-86	2903120182	water		03/10/09	×	×					
PC-90	2903120183	water		03/10/09	×	×					
PC-56	2903120184	water		60/60/20	×	×					
PC-58	2903120185	water		60/60/20	×	×					
PC-59	2903120186	water		60/60/20	×	×					
PC-60	2903120187	water		60/60/20	×	×					
PC-62	2903120188	water		60/60/20	×	×					
PC-68	2903120189	water		03/09/09	×	×					
PC-91	2903120190	water		03/10/09	×	×					
PC-97	2903120191	water		03/10/09	×	×					
PC-18	2903120192	water		03/10/09	×	×					
PC-55	2903120193	water		03/10/09	×	×					
MW-K4	2903120194	water		03/11/09	×	×					
ARP-1	2903120195	water		03/11/09	×	×					
ARP-4A	2903120196	water		03/11/09	×	×					
ARP-5A	2903120197	water		03/11/09	×	×					

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

<b>SDG#</b> : 267194				VALID	ATIONS	VALIDATION SAMPLE TABLE		LDC#: 21040L	
Project Name: Annual Remedial Performance Sampling	iedial Performance	Samplir	Q	Param	ieters/Ar	Parameters/Analytical Method			
Client ID #	Lab ID #	Matrix	QC Type	Date Matrix QC Type   Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)			
ARP-6B	2903120198	water		03/11/09	×	×			
PC-53	2903120199	water		03/11/09	×	×			
PC-103	2903120200	water		03/11/09	×	×			
MW-K5	2903120201	water		03/11/09	×	×			
ART-8	2903120202	water		03/09/09	×	×			

SDG#: 268707				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE				LDC#: 21040M	M0#
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplin	0	Param	eters/An	Parameters/Analytical Method	ethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)						
ART-1	2904070330	water		04/06/09	×	×						
ART-2	2904070331	water		04/06/09	×	×						
ART-3	2904070332	water		04/06/09	×	×						
ART-4	2904070333	water		04/06/09	×	×			· · · · · · · · · · · · · · · · · · ·			
ART-7	2904070334	water		04/06/09	×	×						
ART-8	2904070335	water		04/06/09	×	×						
PC-99R2/R3	2904070336	water		04/06/09	×	×						
PC-115R	2904070337	water		04/06/09	×	×						
PC-116R	2904070338	water		04/06/09	×	×						
SF-1	2904070339	water		04/06/09	×	×						
PC-117	2904070340	water		04/06/09	×	×						
PC-118	2904070341	water		04/06/09	×	×						
PC-120	2904070342	water		04/06/09	×	×						
PC-121	2904070343	water		04/06/09	×	×						
PC-133	2904070344	water		04/06/09	×	×						
ART-9	2904070345	water		04/06/09	×	×						

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

<b>SDG#</b> : 269377				VALID,	ATION S	VALIDATION SAMPLE TABLE	Ш		<b>0</b> 07	LDC#: 21040N
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplii	າg	Paran	ieters/An	Parameters/Analytical Method	P			
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)				
MW-K4	2904160331	water		04/15/09	×	×				
ARP-1	2904160332	water		04/14/09	×	×				
ARP-4A	2904160333	water		04/15/09	×	×				
ARP-5A	2904160334	water		04/15/09	×	×				
ARP-6B	2904160335	water		04/15/09	×	×				
PC-53	2904160336	water		04/15/09	×	×				
PC-103	2904160337	water		04/15/09	×	×				
MW-K5	2904160338	water		04/15/09	×	×				
M-87	2904160339	water		04/15/09	×	×				
PC-98R	2904160340	water		04/15/09	×	×				
PC-86	2904160341	water		04/14/09	×	×				
PC-90	2904160342	water		04/14/09	×	×				
PC-56	2904160343	water		04/14/09	×	×				
PC-58	2904160344	water		04/14/09	×	×				
PC-59	2904160345	water		04/14/09	×	×				
PC-60	2904160346	water		04/14/09	×	×				
PC-62	2904160347	water		04/14/09	×	×				
PC-68	2904160348	water		04/14/09	×	×				

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

<b>SDG#:</b> 269377				VALID	ATION S	VALIDATION SAMPLE TABLE		LDC#: 21040N	40N
Project Name: Annual Remedial Performance Sampling	edial Performance	Samplir	<u> </u>	Paran	eters/An	Parameters/Analytical Method			
Client ID #	Lab ID#	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)			
PC-91	2904160349	water		04/14/09	×	×			
PC-97	2904160350	water		04/14/09	×	×			
PC-18	2904160351	water		04/14/09	×	×			
PC-55	2904160352	water	,	04/14/09	×	×			
PC-101R	2904160353	water		04/14/09	×	×			

SDG#: 270339				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE					<b>■ DC#:</b> 210400	CO
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplii	סַ	Parar	neters/An	Parameters/Analytical Method	lethod						)
				Date	Č	Cr(VI)			Chlorate	N-CN			
Client ID #	Lab ID #	Matrix	QC Type	ŏ	(6010B)	(7196)	(314.0)	(160.1)	(9056)	(9026)			
PC-123	2905060024	water		05/04/09	X		×	×					
PC-124	2905060025	water		05/04/09	X		***	×	* *	×			
PC-125	2905060026	water		05/04/09	×		×	×					
PC-126	2905060027	water		05/04/09	×		×	×	×	×			
PC-127	2905060028	water		05/04/09	×		×	×					
PC-128	2905060029	water		05/04/09	×		il.	×	×	×			
PC-129	2905060030	water		05/04/09	×		×	×					
PC-130	2905060031	water		05/04/09	×		×	×	×	×			
PC-131	2905060032	water		05/04/09	×		×	×					
PC-132	2905060033	water		05/04/09	×		×	×	×	×			
M-96	2905060034	water		05/04/09	×		×	l×					Ī
PC-54	2905060035	water	FD2	05/04/09				×					
PC-37	2905060036	water		05/04/09	X			×					
PC-71	2905060037	water		05/04/09	×	280E	×	×					
PC-72	2905060038	water		05/04/09	X		X	×3					
PC-73	2905060039	water		05/04/09	X		X	×					
M-23	2905060040	water		05/04/09	×		X	×	×	×			
M-95	2905060041	water	FD1	05/04/09	×	×	×	×					

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

SDG#: 270339				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE					L <b>DC#</b> : 210400	0400
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplii	Jg.	Paran	Parameters/Analytical Method	alytical	<b>Aethod</b>						
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub>	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)			
M-44	2905060042	water		05/04/09	×	X	X	×					
FB-1	2905060043	water	FB	05/04/09	×	×	×	×					
MD-1	2905060049	water	FD1	05/04/09	×		×	×					
MD-3	2905060050	water	FD2	05/04/09	×		×	×					
PC-126MS	2905060027MS	water	MS	05/04/09	×								
PC-126MSD	2905060027MSD	water	MSD	05/04/09	×								
PC-126DUP	2905060027DUP	water	DUP	05/04/09				×					
M-23MS	2905060040MS	water	MS	05/04/09	×								
M-23MSD	2905060040MSD	water	MSD	05/04/09	×								
PC-129DUP	2905060030DUP	water	DUP	05/04/09				×					
MD-1MS	2905060049MS	water	MS	05/04/09		×							
MD-1MSD	2905060049MSD	water	MSD	05/04/09		×							

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<b>SDG#</b> : 270369				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21040P	1040P
Project Name: Annual Remedial Performance Sampling	ledial Performance	Samplir	ĵ Di	Parar	Parameters/Analytical Method	alytical I	Vethod				
Client ID #	Lab ID #	Matrix	Matrix QC Type C	Date Collected	Date   Cr CLO <sub>4</sub> TDS :ollected (6010B) (314.0) (160.1)	CLO <sub>4</sub> (314.0)	TDS (160.1)			 	
M-5A	2905060129	water		60/20/50	×	×	×				
M-5AMS	2905060129MS	water	MS	02/02/09	×						
M-5AMSD	2905060129MSD	water	MSD	60/20/20	×	-	-	-			

<b>SDG#:</b> 270376				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE		EDC#: 210400
Project Name: Annual Remedial Performance Sampling	medial Performance	Samplir	DQ.	Paran	neters/An	Parameters/Analytical Method	lethod		
Client ID #	# CI 40	M Virto	, C		Cr	CLO4	TDS		0
0-1	2905060173	water		05/05/09	(90100) ×	+	(1:00.1) ×		
d-1	2905060174	water		02/02/09	×	×	×		
프	2905060175	water		02/02/09	×	×	×		
I-U	2905060176	water		02/02/09	×	×	×		
나	2905060177	water		02/02/09	×	×	×		
9-1	2905060178	water		60/50/50	×	×	×		
Ŏ-I	2905060179	water		02/02/09	×	×	×		
4-1	2905060180	water		02/02/09	×	×	×		
N-1	2905060181	water		02/02/09	×	×	×		
<b>4</b>	2905060182	water		02/02/09	×	×	×		
M-1	2905060183	water		05/05/09	×	×	×		
Q-1	2905060184	water		60/90/90	×	×	×		
악	2905060185	water		02/02/09	×	×	×		
F-S	2905060186	water		02/02/09	×	×	×		
7-1	2905060187	water		05/05/09	×	×	×		
I-R	2905060188	water		60/20/50	×	×	×		
P-B	2905060189	water		60/20/50	×	×	×		
I-AR	2905060190	water		02/02/09	×	×	×		

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

<b>SDG#:</b> 270390				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE					LDC#: 21040R	040R
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	ĵ.	Param	eters/An	Parameters/Analytical Method	Vethod						
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)			
I-AA	2905060238	water		05/05/09	×		×	×					
M-131	2905060239	water		60/20/50	×		×	×					
M-57A	2905060240	water	FD	60/90/90	×		×	×					
M-79	2905060241	water		02/02/09	×		×	×					
M-69	2905060242	water		02/02/09	×		×	×					
M-135	2905060243	water		02/02/09	×		×	×					
M-25	2905060244	water		02/02/09	×		×	×	×	×			
M-99	2905060245	water		60/50/50	×		×	×					
M-37	2905060246	water		02/02/09	×	×	×	×	×	×			
MD-4	2905060247	water	FD	02/02/09	×		×	×					
EB-1	2905060248	water	EB	02/02/09	×	×	×	×					
M-135DUP	2905060243DUP	water	DUP	60/50/50				×					-
EB-1MS	2905060248MS	water	MS	02/02/09		×							
EB-1MSD	2905060248MSD	water	MSD	02/02/09		×							

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

SDG#: 270439				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE					L <b>DC#</b> : 21040S	)40S
Project Name: Annual Remedial Performance Sampling	medial Performance	• Sampli	Вu	Paran	Parameters/Analytical Method	alytical ∿	Method						
Client ID #	Lab ID #	Matrix	QC Tvpe	ြင္	Cr (6010B)	Cr(VI)	CLO <sub>4</sub>	TDS (160.1)	Chlorate	NO3-N			
M-92	2905070081	water			×		×	×		1			
M-97	2905070082	water		02/06/09	×		×	×					
M-33	2905070083	water		60/90/50	×		×	×					
M-31A	2905070084	water		60/90/50	×		×	×					
M-52	2905070085	water		60/90/50	×		×	×					
M-50	2905070086	water		60/90/50	×		×	×					
M-21	2905070087	water		60/90/50	×		×	×					
M-34	2905070088	water	FD	60/90/50	×		×	×					
M-35	2905070089	water		60/90/50	×		×	×					
M-19	2905070090	water		60/90/50	×		×	×					
M-39	2905070091	water		60/90/50	×		×	×	×	×			
M-68	2905070092	water		60/90/50	×		×	×					
M-74	2905070093	water		60/90/50	×		×	×					
M-73	2905070094	water		60/90/50	×		×	×					
M-88	2905070095	water		60/90/90	×		×	×					
M-11	2905070096	water		60/90/50	×	×	×	×	×	×			
M-12A	2905070097	water		60/90/50	×	×	×	×	×	×			
M-13	2905070098	water		60/90/50	×		×	×	×	×			
													١

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

<b>SDG#</b> : 270439				VALID	VALIDATION SAMPLE TABLE	MAPLE	TABLE					LDC#: 21040S	040S
Project Name: Annual Remedial Performance Sampling	iedial Performance	Samplin	امً	Paran	Parameters/Analytical Method	ıalytical I	Method						
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)			
MD-5	2905070099	water	FD	60/90/50	×		×	×					
EB-2	2905070100	water	EB	60/90/50	×	×	×	×					
M-74DUP	2905070093DUP	water	DUP	60/90/50				×					
M-12AMS	2905070097MS	water	MS	60/90/50		×							
M-12AMSD	2905070097MSD	water	MSD	60/90/50		×							

SDG#: 270442				VALID.	ATION S	VALIDATION SAMPLE TABLE	TABLE			LDC#: 21040T	040T
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplin	D)	Paran	ieters/Ar	Parameters/Analytical Method	/lethod				
Client ID #	Lab ID #	Matrix	QC Type	Date   COllected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
<del>-</del> -	2905070108	water		60/90/50	×	×	×				
7	2905070009	water		60/90/50	×	×	×				
	2905070110	water		60/90/50	×	×	×				
7-1	2905070111	water		60/90/50	×	×	×				
J-\	2905070112	water		60/90/50	×	×	×				

<b>SDG#:</b> 270507				VALID	ATION §	VALIDATION SAMPLE TABLE	BLE			LDC#:	LDC#: 21040U
Project Name: Annual Remedial Performance Sampling	nedial Performance	Sampli	DU	Paran	∩eters/Ar	Parameters/Analytical Method	poq				
:	:	,	Date CLO4	Date	CLO4	SOT					
Client ID #	Lab ID #	Matrix	QC Type	Collected	(314.0)	(160.1)					
PC-77	2905080074	water		X 60/90/50	×	×					,
PC-74	2905080075	water		60/90/50	×	×					

<b>SDG#:</b> 270531				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			#DCT	LDC#: 21041F
Project Name: 2009 Annual Remedial Performance Sampling	մ Remedial Perform	Jance S	ampling	Paran	neters/An	Parameters/Analytical Method	<b>fethod</b>				
Client ID#	Lab ID #	Matrix	QC Type	Date   Cr TDS NO <sub>3</sub> -N   Matrix   QC Type   Collected   (6010B)   (160.1)   (300.0)	Cr (6010B)	TDS (160.1)	NO <sub>3</sub> -N (300.0)				
M-10	2905080170	water		02/07/09	×	×	×				

SDG#: 270564				VALID,	ATION S	VALIDATION SAMPLE TABLE		LDC#: 21040V
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	<b>o</b>	Param	ieters/Ar	Parameters/Analytical Method		
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)		
НММ9	2905110076	water		02/07/09	×	×		
PC-96	2905110077	water		05/07/09	×	×		
PC-112	2905110078	water		02/07/09	×	×		
PC-110	2905110079	water		02/02/09	×	×		
PC-107	2905110080	water		02/07/09	×	×		
PC-112DUP	2905110078DUP	water	DUP	60/20/90		×		

<b>SDG#</b> : 270567				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE					)[]	LDC#: 21041Q	410
Project Name: 2009 Annual Remedial Performance Sampling	I Remedial Perform	jance Sz	Buildme	Paran	Parameters/Analytical Method	alytical	/ethod							
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	Cr(VI) (7196)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO3/ NO2-N (353.2)				
M-87	2905110089	water		60//0/90	×		×	×						
M-70	2905110090	water		60/20/90	×		×	×				·		
M-71	2905110091	water		60/20/90	×		×	×						
M-72	2905110092	water		60/20/50	×		×	×						
M-38	2905110093	water		60/20/90	×		×	×						
M-36	2905110094	water	Ð	02/07/09	×	×	×	×	×	×			·	
M-84	2905110095	water		60/20/90	×	×	×	×						
M-100	2905110096	water		02/07/09	×	×	×	×						ï
M-10	2905110097	water		02/07/09	×	×	×	×	×	×				
MD-2	2905110098	water	FD	02/01/09	×	×	×	×	×	×				
M-22A	2905110099	water		02/07/09	×		×	×						
M-89	2905110100	water		60/20/50	×		×	×						
M-84MS	2905110095MS	water	MS	02/07/09	×									
M-84MSD	2905110095MSD	water	MSD	60/20/50	×									

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

SDG#: 270578				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE				LDC#: 21040W	1040W
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	Đ(	Paran	∩eters/Ar	Parameters/Analytical Method	Vethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)			
PC-94	2905120033	water		02/08/09		×	×		- ' '			
PC-93	2905120034	water		02/08/09	×	×	×	×	×			
PC-2	2905120035	water		02/08/09	×	×	×	×	×			
HSW-1	2905120036	water		02/08/09		×	×					
HM-2	2905120037	water		02/08/09		×	×					
PC-104	2905120038	water		02/08/09	×	×	×					
HWW14	2905120039	water		60/80/50		×	×					
PC-2MS	2905120035MS	water	MS	02/08/09					×			
PC-2MSD	2905120035MSD	water	MSD	60/80/50					×			

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

<b>SDG#:</b> 270579				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE		LDC#: 21040X
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	ĵ.	Paran	าeters/Ar	Parameters/Analytical Method	/Jethod	The state of the s	
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
M-17A	2905120040	water		60/80/50	×	×	×		
M-2A	2905120041	water		60/80/50	×	×	×		
M-76	2905120042	water		60/80/90	×	×	×		
M-75	2905120043	water		60/80/90	×	×	×		
M-115	2905120044	water		60/80/90	×	×	×		
M-14A	2905120045	water		60/80/90	×	×	×		
M-14ADUP	2905120045DUP	water	DUP	60/80/90			×		

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SDG#: 270628					ATION S	VALIDATION SAMPLE TABLE	TABLE			LDC#: 21041T	1041 T
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	ampling	Paran	neters/An	Parameters/Analytical Method	Wethod				
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)				
ART-1	2905120248	water		05/11/09	×	×	×				
ART-2	2905120250	water		05/11/09	×	×	×				
ART-3	2905120251	water		05/11/09	×	×	×				
ART-4	2905120252	water		05/11/09	×	×	×				
ART-6	2905120253	water		05/11/09	×	×	×				
ART-7	2905120254	water		05/11/09	×	×	×				
ART-8	2905120255	water		05/11/09	×	×	×				
PC-99R2/R3	2905120256	water		05/11/09	×	×	×				
PC-115R	2905120257	water		05/11/09	×	×	×				
PC-116R	2905120258	water		05/11/09	×	×	×				
SF-1	2905120259	water		05/11/09	×	×	×				
PC-117	2905120260	water		05/11/09	×	×	×				
PC-118	2905120261	water		05/11/09	×	×	×				
PC-119	2905120262	water		05/11/09	×	×	×				
PC-120	2905120263	water		05/11/09	×	×	×				
PC-121	2905120264	water		05/11/09	×	×	×				
PC-133	2905120265	water		05/11/09	×	×	×				
ART-9	2905120266	water		02/11/09	×	×	×		-		

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

<b>SDG#:</b> 270628				VALID	ATION S	VALIDATION SAMPLE TABLE	TA\BILE				LDC#: 21041T	1041∏
Project Name: 2009 Annual Remedial Performance Sampling	Remedial Perform	nance Sg	ampling _	Paran	neters/Ar	Parameters/Analytical Method	Vethod		_			
Client ID #	Lab ID #	Matrix	QC Type	Date Matrix QC Type Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)					
ART-6DUP	2905120253DUP	water	DUP	05/11/09			×					
PC-121MS	2905120264MS	water	MS	05/11/09	×							
PC-121MSD	2905120264MSD	water	MSD	05/11/09	×							
PC-133MS	2905120265MS	water	MS	05/11/09	×							
PC-133MSD	2905120265MSD	water	MSD	05/11/09	×		-					

<b>SDG#:</b> 270639				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE		LDC#: 21040Y	k
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	<u> </u>	Paran	Parameters/Analytical Method	alytical	/ethod			
Client ID #	Lab ID #	Matrix	QC Type	Date Matrix QC Type Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
PC-108	2905120278	water		05/11/09		×	×			
HMW-15	2905120280	water		05/11/09		×	×			
HMW-13	2905120281	water		05/11/09		×	×			
PC-79	2905120283	water		05/11/09	×	×	×			
PC-79MS	2905120283MS	water	MS	05/11/09		×				
PC-79MSD	2905120283MSD	water	MSD	05/11/09		×				

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SDG#: 270704				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE	N.				LDG#: 21041G	10416
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	sampling	Paran	Parameters/Analytical Method	alytical N	/lethod						
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)	NO <sub>3</sub> / NO <sub>2</sub> -N (353.2)			
PC-91	2905130175	water		05/12/09	×	×	×	×		×			
PC-86	2905130176	water		05/12/09	×	×	×	×	×				
PC-90	2905130177	water		05/12/09	×	×	×	×	×				
PC-103	2905130178	water		05/12/09	×	×	×	×		×			
MW-K5	2905130179	water		05/12/09	×	×	×	×	×				
PC-56	2905130180	water		05/12/09	×	×	×						
PC-68	2905130181	water		05/12/09	×	×	×						
PC-60	2905130182	water		05/12/09	×	×	×						
PC-58	2905130183	water		05/12/09	×	×	×						
PC-62	2905130184	water		05/12/09	×	×	×						
PC-59	2905130185	water		05/12/09	×	×	×						
PC-98R	2905130186	water		05/12/09	×	×	×						
MW-K4	2905130187	water		05/12/09	×	×	×						
ARP-7	2905130188	water		05/12/09	×	×	×						
M-87	2905130189	water		05/12/09	×	×	×						
PC-97	2905130190	water		05/12/09	×	×	×						
ARP-6B	2905130191	water		05/12/09	×	×	×						
ARP-5A	2905130192	water		05/12/09	×	×	×						

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

<b>SDG#:</b> 270704				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE					LDC#: 21041G	041G
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perforn	nance S	ampling	Paran	Parameters/Analytical Method	alytical I	Vethod						
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate NO <sub>3</sub> -N (9056)	NO <sub>3</sub> -N (9056)	NO <sub>3</sub> / NO <sub>2</sub> -N (353.2)			
ARP-4A	2905130193	water		05/12/09	×	×	×						
PC-53	2905130194	water		05/12/09	×	×	×						
PC-91MS	2905130175MS	water	MS	05/12/09		×							
PC-91MSD	2905130175MSD	water	MSD	05/12/09		×							

<b>SDG#:</b> 270708				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE	2.00			LDC#: 21040Z	1040Z
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplin	DU	Paran	Parameters/Analytical Method	alytical N	Vethod					
Client ID #	Lab ID #	Matrix	Date Cr Matrix QC Type Collected (6010B)	Date Collected	Cr (6010B)	CLO <sub>4</sub> TDS (314.0) (160.1)	TDS (160.1)					
HMW16	2905130203	water		05/12/09		×	×					
PC-24	2905130204	water		05/12/09	×	×	×					
PC-50	2905130205	water		05/12/09	×	×	×					

<b>SDG#:</b> 270794				VALID	VALIDATION SAMPLE TABLE	AMPLE	ABLE	LDC#: 21041H	HI-#(
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perform	nance S≀	ampling	Paran	Parameters/Analytical Method	alytical	ethod		
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
PC-101R	2905140258	water		05/13/09	×	×	×		
PC-18	2905140259	water		05/13/09	×	×	X		
PC-55	2905140260	water		05/13/09	×	×	X		
ARP-1	2905140261	water		05/13/09	×	×	X		
T-635	2905140262	water		05/13/09	×	×	X		
PC-92	2905140263	water		05/13/09	×	×	×		
PC-122	2905140264	water		05/13/09	×	×	×	-	
PC-92DUP	2905140263DUP	water	DUP	05/13/09			×		

SDG#: 270815				VALID	ATION S	VALIDATION SAMPLE TABLE	ABLE	LDC#: 21041A	17.4
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	ĵĝ.	Paran	teters//An	Parameters/Analytical Method	ethod		
Client ID #	Lab ID #	Matrix	Date Matrix QC Type Collected		Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)		
PC-65	2905150035	water		05/13/09	×	×	×		
PC-66	2905150036	water		05/13/09	×	×	×		
PC-67	2905150037	water		05/13/09	×	×	×		
PC-28	2905150038	water		05/13/09	×	×	×		
PC-31	2905150039	water		05/13/09	×	×	×		
PC-40	2905150040	water		05/13/09	×	×	×		

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<b>SDG#:</b> 270845				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE				β0]]	LDC#: 210411
Project Name: 2009 Annual Remedial Performance Sampling	Remedial Perform	iance S	ampling	Paran	neters/Ar	Parameters/Analytical Method	Vethod					
Client ID#	Lab ID #	Matrix	ac Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	N- <sub>3</sub> -N (9056)			
H-58A	290516004	water		05/14/09	×	×	×					
H-48	290516005	water		05/14/09	×	×	×					
MC-65	290516006	water		05/14/09	×	×	×					
PC-21A	290516007	water		05/14/09	×	×	×	×	×			
MC-6	290516008	water		05/14/09		×	×					
MC-7	290516009	water		05/14/09		×	×					
MC-69	290516010	water		05/14/09		×	×					

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SDG#: 270857				VALID	ATION S	VALIDATION SAMPLE TABLE	ABLE			OII	LDC#: 21041B	(B
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	ງອີ	Paran	neters/An	Parameters/Analytical Method	ethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	CLO <sub>4</sub> (314.0)	TDS (160.1)						
MC-3	2905160043	water		05/15/09	×	×						
MC-29	2905160044	water		05/15/09	×	×						
MC-51	2905160045	water		05/15/09	×	×						
MC-50	2905160046	water		05/15/09	×	×						
MC-45	2905160047	water		05/15/09	×	×						
MC-97	2905160048	water		05/15/09	×	×						
MC-93	2905160049	water		05/15/09	×	×						
MC-3DUP	2905160043DUP	water	DUP	05/15/09		×						

SDG#: 270989				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE				FDC#	LDC#: 21041J
Project Name: 2009 Annual Remedial Performance Sampling	ll Remedial Perform	iance Sa	ampling	Paran	neters/Ar	Parameters/Analytical Method	Method					
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	Chlorate (9056)	NO <sub>3</sub> -N (9056)			
FB0151909	2905200126	water	FB	02/19/09	×	×						
HSS	2905200127	water		02/19/09		×	×					
EB051909	2905200128	water	EB	05/19/09		×	×					
FB051909-2	2905200129	water	85	05/19/09	×	×						
PC-82	2905200139	water		02/19/09		×	×	×	×			
FB051909-2MS	2905200129MS	water	MS	02/19/09	×							
FB051909-2MSD	2905200129MSD	water	MSD	05/19/09	×	i						

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<b>SDG#:</b> 270992				VALIE	VALIDATION SAMPLE TABLE	SAMPLE	TABLE					LDC#: 21041K	7041K
Project Name: 2009 Annual Remedial Performance Sampling	ıl Remedial Perforn	nance S	ampling	Parai	Parameters/Analytical Method	halytical I	Method						
Client ID #	Lab ID #	Matrix	Date   Cr   CLO₄   TDS   Chlorate   Cr   CLO₄   TDS   Chlorate   Collected   (6010B)   (314.0)   (160.1)   (9056)	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)	TDS Chlorate NO <sub>3</sub> -N (160.1) (9056) (9056)	NO <sub>3</sub> -N	NO <sub>3</sub> / NO <sub>2</sub> -N			
M-39	2905200140	water		05/19/09 X	×	×	×	×		×			
FB M-39	2905200141	water	FB	02/19/09	×	×	×	×	×				

SDG#: 271048				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE   LDC#: 21041C	041C
Project Name: Annual Remedial Performance Sampling	ledial Performance	Samplir	ල	Paran	Parameters/Analytical Method	alytical N	lethod	
Client ID #	Lab ID #	Matrix	Date QC Type Collected	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	
PC-64	2905210058	water		05/20/09	×	×	×	
FB052009	2905210060	water	FB	05/20/09	×	×	×	
EB052009	2905210061	water	EB	05/20/09	×	×	×	
M-65	2905210062	water	12 1	05/20/09	×	×	×	-
M-134	2905210063	water	FD	05/20/09	×	×	×	
DUPLICATE	2905210064	water	FD	05/20/09	×	×	×	
PC-64DUP	2905210058DUP	water	DUP	02/20/08			×	
FB052009MS	2905210060MS	water	MS	05/20/09	×			
FB052009MSD	2905210060MSD	water	MSD	05/20/09	×			

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SDG#: 271066				VALID	VALIDATION SAMPLE TABLE	AMPLE		LDC#: 21041U
Project Name: 2009 Annual Remedial Performance Sampling	ıl Remedial Perform	iance Sa	ampling	Paran	Parameters/Analytical Method	alytical	Vethod	
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	
CLDR-2	2905210121	water		05/20/09	×	×	×	
M-130	2905210124	water		05/20/09	×	×	×	
M-129	2905210125	water		05/20/09	×	×	×	
M-67	2905210126	water		05/20/09	×	×	×	
M-66	2905210127	water		02/20/09	×	×	×	
FB-CLDR-2	2905210128	water	FB	02/20/08	×	×	×	

SDG#: 271121				VALID	VALIDATION SAMPLE TABLE	AMPLE	TAB⊥E	LBC#: 21041D
Project Name: Annual Remedial Performance Sampling	nedial Performance	Samplir	<b>D</b> )	Paran	Parameters/Analytical Method	alytical I	/ethod	
Client ID #	Lab ID #	Matrix	QC Tvbe	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)	
M-64	2905220113			05/21/09	×	×	×	
M-136	2905220114	water		05/21/09	×	×	×	
MW-16	2905220115	water		05/21/09	×	×	×	
FB052109	2905220116	water	FB	05/21/09	×	×	×	
EB052109	2905220117	water	EB	05/21/09	×	×	×	
MW-132	2905220118	water	FD	05/21/09	×	×	×	
MW-133	2905220119	water		05/21/09	×	×	×	
M-126	2905220120	water		05/21/09	×	×	×	
M-127	2905220121	water		05/21/09	×	×	×	
DUPLICATE	2905220122	water	FD	05/21/09	×	×	×	

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<b>SDG#:</b> 271160				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE	LDC#: 21041L
Project Name: 2009 Annual Remedial Performance Sampling	il Remedial Perforn	nance S	ampling	Paran	Parameters/Analytical Method	alytical N	/ethod	
Client ID#	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	
M-125	2905260003	water	FD	05/22/09		×	×	
M-128	2905260004	water		05/22/09		×	×	
M-124	2905260005	water		05/22/09	×	×	×	
FB052209	2905260006	water	FB	05/22/09		×	×	
M-123	2905260007	water		05/22/09		×	×	
DUPLICATE	2905260008	water	FD	05/22/09		×	×	

SDG#: 271248				VALID,	ATION S	VALIDATION SAMPLE TABLE	TABLE		#9 <b>0</b> 7	LDC#: 21041M
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perforn	nance S	ampling	Param	teters/An	Parameters/Analytical Method	lethod			
Client ID#	Lab ID #	Matrix	Matrix QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)			
HM-2	2905270103	water		02/26/09		×	×			
M-111A	2905270104	water		02/26/09	×	×	×			
FB052609	2905270105	water	FB	02/26/09		×	×			
M-142	2905270106	water	FD	02/26/09		×	×			
EB052609	2905270107	water	EB	05/26/09		×	×			
DUPLICATE	2905270109	water	FD	05/26/09		×	×			

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SDG#: 271325				VALID	ATION S	VALIDATION SAMPLE TABLE	TARIE	in the			E BYW. 94604E	□ 17V ∪
Project Name: Annual Remedial Performance Sampling	edial Performance	Samplir	0	Paran	neters/An	Parameters/Analytical Method	Tethod				i S	
Client ID #	Lab ID#	Matrix	OC Tvpe	Matrix OC Type Collected (314.0)	CLO <sub>4</sub>	TDS (160.1)						
AA-01	2905290074	water		05/28/09	×	×						
AA-01DUP	2905290074DUP	water	DUP	05/28/09		×						

SDG#: 271337				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			Ö	LDC#: 21041R
Project Name: 2009 Annual Remedial Performance Sampling	il Remedial Perform	Jance S	ampling	Paran	Parameters/Analytical Method	ıalytical	Method				
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	NO <sub>3</sub> -N (300.0)			
TR-2	2905300001	water		05/29/09	×	×	×	×			
TR-5	2905300002	water		05/29/09	×	×	×	×			
TR-6	2905300003	water		02/29/09	×	×	×	×			
TR-7	2905300004	water		02/29/09	×	×	×	×			
FB052909	2905300005	water	FB	02/29/09		×	×				
TR-9	2905300008	water		02/29/09	×	×	×	×			
TR-8	2905300009	water		02/29/09	×	×	×	×			
TR-2MS	2905300001MS	water	MS	05/29/09				×			
TR-2MSD	2905300001MSD	water	MSD	05/29/09				×			

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SDG#: 271400				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABUE				L <b>DC#:</b> 21041N	041N
Project Name: 2009 Annual Remedial Performance Sampling	I Remedial Perforn	nance S	ampling	Parar	Parameters/Analytical Method	ialytical I	Vethod					
Client ID #		Matrix	July T	Date	Cr	CLO4	TDS	N-sON				
TR-11	2906020040	water	300	06/01/09	(GOLOO) ×	(0.4.0) ×	× ×	(200.0) ×				
TR-12	2906020041	water		06/01/09	×	×	×	×				
TR-1	2906020042	water		06/01/09	×	×	×	×				
TR-10	2906020043	water		06/01/09	×	×	×	×				
FB060109	2906020044	water	FB	06/01/09	×	×	×	×				
M-103	2906020045	water	6	06/01/09	×	×	×	×				
M-117	2906020046	water		06/01/09	×	×	×	×				
M-118	2906020047	water		06/01/09	×	×	×	×				
DUPLICATE	2906020048	water	FD	06/01/09	×	×	×	×				
TR-12MS	2906020041MS	water	MS	06/01/09				×				
TR-12MSD	2906020041MSD	water	MSD	06/01/09				×				
FB060109MS	2906020044MS	water	MS	06/01/09	×							
FB060109MSD	2906020044MSD	water	MSD	06/01/09	×							

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SDG#: 271465				VALID	VALIDATION SAMPLE TABLE	SAMPLE	TABLE				LDG#: 210410	10410
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perforr	nance S	ampling	Paran	Parameters/Analytical Method	าลlytical ไ	Method					
Client ID #	Lab ID#	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)	NO <sub>3</sub> -N (300.0)				
M-121	2906030033	water		06/02/09	×	×	×					
M-120	2906030034	water		06/02/09	×	×	×					
FB060209	2906030035	water	FB	06/02/09	×	×	×					
TR-4	2906030036	water	FD	06/05/09	×	×	×	×				
DUPLICATE	2906030037	water	БD	06/07/09	×	×	×					
DUPLICATEMS	2906030037MS	water	MS	06/05/09	×							
DUPLICATEMSD	2906030037MSD	water	MSD	06/05/09	×							
DUPLICATEDUP	2906030037DUP	water	DUP	06/05/09			×					

<b>SDG#:</b> 271624				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE				LDC#: 21041P	)41P
Project Name: 2009 Annual Remedial Performance Sampling	Il Remedial Perform	nance S	ampling	Paran	Parameters/Analytical Method	alytical N	/ethod					
Client ID #	Lab ID #	Matrix	QC Type	Date Cr Matrix QC Type Collected (6010B)	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)	NO <sub>3</sub> -N				
TR-3	2906060030	water		06/04/09	×	×	×	×				
H-11	2906060032	water	£	06/04/09		×	×					
FB060409	2906060033	water	FB	06/04/09		×	×					
DUPLICATE	2906060034	water	FD	06/04/09		×	×					

<b>SDG#:</b> 271687				VALID	VALIDATION SAMPLE TABLE	MAMPLE	TABLE				LDC#: 21041V	10410
Project Name: 2009 Annual Remedial Performance Sampling	ıl Remedial Perforn	nance S	ampling	Parar	Parameters/Analytical Method	nalytical	Method					
				ć	(							
Client ID #	Lab ID #	Matrix	Matrix QC Type	Date Collected	Date Cr CLO <sub>4</sub>	(314.0)	1DS (160.1)			 		
M-7B	2906090099	water		X 60/80/90		×	×					
M-7BDUP	2906090099DUP	water	DUP	60/80/90			×		,			

SDG#: 271731					ATION S	VALIDATION SAMPLE TABLE			#9(C)	DC#: 21041S
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perfor	mance S	ampling	Paran	neters//An	Parameters/Analytical Method		10 mm m m m m m m m m m m m m m m m m m		
				Date	CL04	TDS	Transfer of the Control of the Contr			
Client ID #	Lab ID #	Matrix	QC Type	Collected	(314.0)	(160.1)				
ART-2	2906090174	water		60/80/90	< ×	< >				
ART-3	2906090175	water		60/80/90	×	× ×				
ART-4	2906090176	water		60/80/90	×	×				
ART-6	2906090177	water		60/80/90	×	×				
ART-7	2906090178	water		60/80/90	×	×				
ART-8	2906090179	water		60/80/90	×	×				
PC-99R2/R3	2906090180	water		60/80/90	×	×				
PC-115R	2906090181	water		60/80/90	×	×				
PC-116R	2906090182	water		60/80/90	×	×				
SF-1	2906090183	water		60/80/90	×	×				
PC-117	2906090184	water		60/80/90	×	×				
PC-118	2906090185	water		60/80/90	×	×				
PC-119	2906090186	water		60/80/90	×	×				
PC-120	2906090187	water		60/80/90	×	×				
PC-121	2906090188	water		60/80/90	×	×				
PC-133	2906090189	water		60/80/90	×	×				
ART-9	2906090190	water		60/80/90	×	×				

SDG#; 271791				VALID	ATIONS	VALIDATION SAMPLE TABLE	TABLE			LDC#: 21041W	041W
Project Name: 2009 Annual Remedial Performance Sampling	ll Remedial Perform	nance S	ampling	Paran	neters/Ar	Parameters/Analytical Method	1ethod				
Client ID#	Lab ID #	Matrix	QC Type	Matrix QC Type Collected (6010B) (314.0)	Cr (6010B)	Cr CLO <sub>4</sub> TDS 010B) (314.0) (160.1)	TDS (160.1)				
H-28A	2906100166	water		60/60/90	×	×	×				
H-28ADUP	2906100166DUP	water	DUP	60/60/90			×				

<b>SDG#:</b> 271832				VALID	VALIDATION SAMPLE TABLE	AMPLE.	TABLE				#SQT	LDC#: 21041X
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perfon	nance S	ampling	Paran	Parameters/Analytical Method	alytical N	[ethod					
Client ID#	Lab ID#	Matrix	0	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)					
M-87	2906110044	water	_			×	×					
PC-98R	2906110045	water		60/60/90		×	×					
PC-86	2906110046	water		60/60/90		×	×					
PC-90	2906110047	water		60/60/90		×	×					
PC-56	2906110048	water		60/60/90		×	×					
PC-58	2906110049	water		60/60/90		×	×					
PC-59	2906110050	water		60/60/90		×	×					
PC-60	2906110051	water		60/60/90		×	×					
PC-62	2906110052	water		60/60/90		×	×					
PC-68	2906110053	water		60/60/90		×	×					
PC-122	2906110054	water		60/60/90		×	×					
MW-K4	2906110055	water		60/60/90	×	×	×					
ARP-1	2906110056	water		60/60/90	×	×	×					
ARP-4A	2906110057	water		60/60/90		×	×					
ARP-5A	2906110058	water		60/60/90		×	×	-				
ARP-6B	2906110059	water		60/60/90		×	×					
ARP-7	2906110060	water		60/60/90		×	×					
PC-53	2906110061	water		60/60/90		×	×					

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<b>SDG#:</b> 271832				VALID.	VALIDATION SAMPLE TABLE	AMPLE	TABLE		LDC#: 21041X
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perforr	nance S.	ampling	Param	Parameters/Analytical Method	alytical N	ethod		
Client ID #	Lab ID #	Matrix	QC Type	Date Collected	Cr (6010B)	CLO <sub>4</sub>	TDS (160.1)		
PC-103	2906110062	water		60/60/90		×	×		
MW-K5	2906110063	water		60/60/90		×	×		
PC-91	2906110064	water		60/60/90		×	×		
PC-97	2906110065	water		60/60/90		×	×		
PC-18	2906110066	water		60/60/90		×	×		
PC-55	2906110067	water		60/60/90		×	×		
PC-101R	2906110068	water		60/60/90		×	×		
L-635	2906110069	water		60/60/90		×	×		

SDG#: 271854				VALID	ATIONS	SAMPLE	VALIDATION SAMPLE TABLE			<b>□C#:</b> 21041¥	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\
Project Name: 2009 Annual Remedial Performance Sampling	al Remedial Perforn	nance S	ampling	Parar	Parameters/Analytical Method	nalytical I	Method				
Client ID #	Lab ID#	Matrix	Matrix QC Type		Date Cr CLO <sub>4</sub> TDS	CLO <sub>4</sub>	TDS (160.1)				
M-6A	2906110134	water		06/10/09	×	×	×				

William St. Co.			_
LDC#: 21041Z			
#: 2			
0			
-			
	Ny i		
118	Pol	TDS (160.1)	×
TΑ	Met	TDS (160.1	
1	<u>8</u>	0. .0.	
AM	a Z	CL 314	×
VALIDATION SAMPLE TABLE	Parameters/Analytical Method	B B	
0	ters	ر 100	×
IDA	ame	ō ō	
¥	Par	ate lecte	96/15/09
		0.0	/90
	JG	Matrix QC Type Collected (6010B) (314.0)	
	iidu	SC T	
	Sar	×	
	nce	Aatri	water
	ıma		
	erfo	-44	
	<u>a</u>	Lab ID #	64
	iedi	Lat	2906160064
	Zen		3906
	Ta l		
	Ę		
	760		
	: 20	Client ID #	
666	ıme	lient	
271	t Na	ᅙ	
SDG#: 271999	Project Name: 2009 Annual Remedial Performance Sampling		ည
SDC	Pro		MC-53
<b>1</b>			

				VALID	ATION S	VALIDATION SAMPLE TABLE	TABLE			007	LDC#: 21041AA	⋖
ď	Project Name: 2009 Annual Remedial Performance Sampling	nance S	ampling	Parar	neters/Ar	Parameters/Analytical Method	/ethod					
	Lab ID #	Matrix	Matrix   QC Type   Co	Date Collected	Cr (6010B)	Date Cr CLO <sub>4</sub> TDS	TDS (160.1)					
7	2906170090	water		06/16/09	×	×	×					

SDG#: 272306				VALID	VALIDATION SAMPLE TABLE	AMPLE	TABLE			LDC#: 21041BB	11BB
Project Name: 2009 Annual Remedial Performance Sampling	Remedial Perform	nance S	ampling	Paran	Parameters/Analytical Method	alytical I	/Jethod				
Client ID#	Lab ID #	Matrix	QC Type	Date   Cr   CLO <sub>4</sub>   TDS   Matrix   QC Type   Collected   (6010B)   (314.0)   (160.1)	Cr (6010B)	CLO <sub>4</sub> (314.0)	TDS (160.1)				
PC-94	2906270007	water		06/25/09	×	×	×				
PC-2	2906270008	water		06/25/09	×	×	×				
PC-1	2906270009	water		06/25/09	×	×	×				

Table II. Qualification Codes and Definitions

Code	Definition
а	qualified due to low abundance (radiochemical activity)
b	qualified due to blank contamination
be	qualified due to equipment blank contamination
bf	qualified due to field blank contamination
bl	qualified due to lab blank contamination
С	qualified due to calibration problems
ср	qualified due to insufficient ingrowth (radiochemical only)
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 only)
I	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)
р	qualified as a false positive due to contamination during shipping
q	qualified due to quantitation problem
S	qualified due to surrogate recoveries
t	qualified due to elevated helium tracer concentrations
x	qualified due to low % solids
у	qualified due to serial dilution results
Z	qualified due to ICS results

UT.		-	Ω	er (murr		Qualifier	_ Qualifier	Code	Definition	
	11/04/08	6010B	7440-47-3	Chromium	0.46	d mg/l	l J	fd	Field Duplicate RPD	45 %
	11/04/08	6010B	7440-47-3	Chromium	0.73	d mg/l	<u> </u>	Ęq.	Field Duplicate RPD	45 %
	08/02/08	160.1/SM2540C	TDS	Total Dissolved Solids	8100	l/gm	- <u>(</u>	h	Holding Time	13 Days
	80/04/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	958	l/gm	-Ţ	h	Holding Time	43 Days
	08/11/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7400	mg/l	<u></u>	1,1d	LCS %R Lab Dim RPD	13.7%
	08/18/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	9550	//gm	+,	_	LCS %R	125.7 %
	80/80/60	160.1/SM2540C TDS	TDS	Total Dissolved Solids	8650	mg/1	1	h	Holding Time	11 Days
	80/60/60	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7200	l/gm	1	h	Holding Time	13 Days
	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7500	l/gm			LCS %R	125.7 %
	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	0896	l/gm	<u>+</u> ,	_	LCS %R	125.7 %
ART-3	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	8500	l/gm	+,	_	LCS %R	125.7 %
ART-6	10/13/08	160.1/SM2540C	TDS	Total Dissolved Solids	8000	l/gm	+(		LCS %R	125.7 %
ART-7	10/13/08	160.1/SM2540C	TDS	Total Dissolved Solids	10400	l/gm	+(	1	LCS %R	125.7 %
ART-8	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	0926	l/gm	<u>+,</u>	_	LCS %R	125.7 %
ART-9	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	8090	l/gm	+6 _	_	LCS %R	125.7 %
PC-115R	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	4560	l/gm	+ſ	_	LCS %R	125.7 %
PC-116R	10/13/08	160.1/SM2540C	TDS	Total Dissolved Solids	4300	l/gm	+,	_	LCS %R	125.7 %
PC-117	10/13/08	160.1/SM2540C	TDS	Total Dissolved Solids	3140	l/gm	<u></u> <u>+</u> ,	_	LCS %R	125.7 %
PC-118	10/13/08	160.1/SM2540C	TDS	Total Dissolved Solids	4170	l/gm	<u>+</u> ,		LCS %R	125.7 %
PC-119	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	3060	l/gm	+,	_	LCS %R	125.7 %
PC-120	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	3070	l/gm	<u>+,</u>		LCS %R	125.7 %
PC-121	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	2700	l/gm	+,		LCS %R	125.7 %
PC-133	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	2620	l/gm	+,	_	LCS %R	125.7 %
PC-99R2/R3	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	4810	l/gm			LCS %R	125.7 %
	10/13/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	0899	l/gm	+, -		LCS %R	125.7 %
ARP-1	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	6300	l/gm	1	п	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7320	l/gm		h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	6700	l/gm		'n	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	8180	l/gm	1 J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	9760	l/gm	I J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C	TDS	Total Dissolved Solids	6980	l/gm	J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7050	l/gm	J.	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	3180	l/gm	l J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	4230	l/gm	l J-	h	Holding Time	11 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	4280	l/gm	l J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C	TDS	Total Dissolved Solids	3090	l/gm	-f 1	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	2050	l/gm	-f ]	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C	TDS	Total Dissolved Solids	2560	l/gm	J	Ч	Holding Time	8 Days
PC-90	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	4490	l/gm	1 J-	ų	Holding Time	8 Days
	10/14/08	160.1/SM2540C	TDS	Total Dissolved Solids	7080	l/gm	J J-	h	Holding Time	8 Days
	10/14/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	2460	I/gm	I J-	h	Holding Time	8 Days
PC-98R	10/12/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	0999	l/gm	I [J-	h	Holding Time	8 Days
PC-58	11/10/08	160.1/SM2540C TDS	TDS	Total Dissolved Solids	7510	l/gm	I J-	h	Holding Time	9 Days
	02/03/09	160.1/SM2540C TDS	TDS	Total Dissolved Solids	17700	l/gm	I J-	h	Holding Time	16 Days
	00,00,00	0011011011	000							

Table III. Overall Qualified Results

Table III.

m Finding	32 Hours	32 Hours	31.5 Hours	Hours	Hours	35.5 Hours	Hours	Hours	Hours	29 5 Hours	Hours	30 5 Hours	Hours	Hours	Hours	80 Hours	Hours	Hours	Hours	Hours	me/L	Hours	Tours	Hours	30 Hours	Hours	30 Hours	Hours	Tours	Hours	Hours	31.5 Hours	32 Hours	30.5 Hours	Hours	Hours	Hours	-lours	-lours	Hours	Hours	Hours	Hours	Hours	Hours	Tours
Qualification Finding	321	32]	31.5	31.75 Hours	31.75 Hours	35.5	33 1	33.75 Hours	53.5	29.5	31.25 Hours	30.5	311	31	31.25 Hours	80	75	47.25 Hours	1 65		0.017	50.5	49.75 Hours	29.75	30	29.5	30 I	35.75 Hours	32.75 Hours	32.75 Hours	31.25 Hours	31.51	32 I	30.5 I	31.5 Hours	30.25 Hours	30.5 Hours	29.5 Hours	29.75 Hours	29.75 I	33.75 Hours	32.25 H	32.75 Hours	32.75 I	31.5 Hours	31.5 Hours
Reason Code Definition	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Equipment Blank	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time											
n Reason Code	모	h	h	h	Ч	h	h	h	h	h	h	<u></u>	h	h	h	h	h	9		4	-	De,n	h	h	h	h	h	ų	ų	h	Ч	h	ų	lh	h	ų	h	h	h	h	h	h	h	h	h	-
Validation Oualifier	II)	J-	]- [	LD.	)- (	Ľ)	-T	<u>-</u> ſ	-	UJ	J-	-[	<u>,</u>			R		[]					-1		]-	1	-1	C)			U.)		UJ	_	-			-		_	C.1	-	_		UJ	_
Units	mg/l	mg/l	mg/l		mg/l				$\vdash$	T	Ť i	mg/l	mg/l	mg/l	mg/l		mg/l	+	mg/l	mg/l	) [	liig/i	mg/l	mg/l	mg/l	mg/l	mg/l		mg/l	l/gm	-	mg/l	mg/l	[ ]/gui	[ ]/gm	mg/l	[ ]/gw	mg/l	mg/l	mg/l	mg/l	mg/l  J	mg/l	l/gm		mø/l l
- Lab Qualifier	n	þ	q	n		n	p	p	þ	n		P			p	n		n		P			p		þ	p	p	n	þ	þ	n		n		þ		p	þ			n	þ	þ	þ	n	
Lab Result	0.005	0.81	.3	0.005	0.033	0.005	3.16	14.2	3.22	0.005	0.277	37.4	0.065	0.07	1.22	0.005	0.02	0.005	0.017	3.38	7500	000	3.58	.259	13.7	36.6		0.005		1.26	0.005	0.036	0.005	900.0		0.172	3.92		0.039	0.044		0.835	1.14	1.14		900 0
Analyte	Chromium-hexavalent 0	Chromium-hexavalent 0	Chromium-hexavalent	Chromium-hexavalent 0	Chromium-hexavalent 0			Chromium-hexavalent 1	Chromium-hexavalent 3				Chromium-hexavalent 0		Chromium-hexavalent 1			П		Г	Chromium boxoxolout				$\Box$								Chromium-hexavalent 0				Chromium-hexavalent 3	Chromium-hexavalent 3					T	_		Chromium-hexavalent 10
	18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9			18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9		18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540 20 0													$\neg$	18540-29-9			$\neg$	18540-29-9			T			18540-29-9	
Method	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	0717	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196
Cricul Sample Sample Date	08/04/08	08/04/08	08/04/08	08/02/08	08/02/08	80/90/80	80/90/80			80/20/80		80/20/80		80//0/80	11/03/08	11/04/08	11/04/08	11/05/08	11/05/08	11/05/08	11/05/08			11/06/08	11/06/08									1												02/02/06
Citeut Sample ID	FB-1	M-44	M-95	EB-1	M-37	EB-2	M-11	M-12A	MD-1	M-10	M-100	M-36	M-84	MD-2	M-95	EB-1	M-37	M-10	EB-2	M-11	M-84		MD-1	M-100	M-12A	M-36	MD-2	FB-1	M-95	MD-1	EB-1	M-37	EB-2	M-10	M-12A	M-100	M-11	M-36	M-84	MD-2	FB-1	M-44	M-95	MD-1	EB-1	M-37
		_						250101		250139	250139	250139			258305		258410	258563	258563	258563	258563						П		П	T			Т	1	T	П									Т	270390

Table III. Overall Qualified Results (Continued)

Table III. Overall Qualified Results (Continued)

8 H									
n Find	Hours	Hours	fours	33 Hours	fours	Iours	lours	Hours	Hours
ficatio	27.5 Hours	24.5 Hours	31.25 Hours	33 F	32.5 Hours	32.75 Hours	32.5 Hours	51 F	51 F
Qualificati			3			3			
	ē	le	e	ıe	ıe	ıe	ıe	<u>2</u>	je
Reason Code Definition	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time	Holding Time
Reaso Defi	Holdii	Holdii	Holdiı	Holdir	Holdir	Holdi	Holdi	Holdii	Holdin
									_
Reason Code									
О.	h	h	h	h	h	h	h	-	ᆈ
Validatio Qualifier									
ts Va	n	J-	m	<u>-</u>	-f	1 )-	-(	<u></u>	-
Umil	l/gm	l/gm	l/gm	l/gm	mg/l	l/gm	l/gm	mg/l	l/gui
Lab alifier									
n) H	n	p	n					þ	Р
).Resu	)5	~	)5	- - - -		7			
Lai	0.005	3.72	0.0	0.1	35	0.12	35	20	34
	hromium-hexavalent	Chromium-hexavalent 3.72	Chromium-hexavalent 0.005	Chromium-hexavalent 0.148	Chromium-hexavalent 35	Chromium-hexavalent	Chromium-hexavalent 35		
Analyte	ı-hexa	ı-hexa	1-hexa	-hexa	ı-hexa	1-hexa	1-hexa	(N	(N
Y	omiun	omiun	omiun	omiun	omiun	omiun	omiun	Nitrate (as N)	Nitrate (as N)
9	Chr	Chr	Chr	Chr	Chr	Chr	Chr	Nitr	Nitr
Analy	6-67	6-67	6-67	29-9	29-9	29-9	29-9		
Client An ID	8540-59-9	8540-59-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9	18540-29-9	NO3	N03
_									1
Metho									
	7196	7196	7196	7196	7196	7196	7196	9026	9026
e Date	6	6(	6	60	6	<u>6</u>	6(	6(	6(
Sampl	60/90/50	60/90/50	02/01/09	02/01/09	02/01/09	02/01/09	02/01/09	05/04/09	05/04/09
nple	٦	0	٦		٥	٦		٥	J
Client Sample ID				00	,c	_	2	24	30
Clie	EB-2	M-11	M-10	M-100	M-36	M-84	MD-2	PC-124	PC-130
SDG	70439	70439	79507	70567	70567	70567	70567	70339	270339
	270	276	270	270	270	270	270	270	270

# **ATTACHMENT A**

**Metals Data Validation Report** 

### Metals by EPA SW 846 Method 6010B for Chromium

## 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 for samples on which a Stage 4 review 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 reviewed for Stage 2A.

#### IV. Blanks

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

Samples EB-1 (from SDGs 249949, 258410, 264774, and 270390), EB-2 (from SDGs 250101, 258623, 264820, and 270439,), EB052009 (from SDG 271048), and EB052109 (from SDG 271121) were identified as equipment blanks. No chromium was found in these blanks.

Samples FB-1 (from SDGs 249697, 258305, 264580, and 270339), FB0151909, FB051909-2 (both from SDG 270989), FB M-39 (from SDG 270992), FB052009 (from SDG 271048), FB-CLDR-2 (from SDG 271066), FB052109 (from SDG 271121), FB060109 (from SDG 271400), and FB060209 (from SDG 271465) were identified as field blanks. No chromium was found in these blanks.

No field blanks were identified in all other SDGs.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

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

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

### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

### VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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 analysis data were not reviewed for Stage 2A.

ICP serial dilution was not performed for all other 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 have been summarized at the end of this report if data has been qualified.

## XIV. Field Duplicates

Samples PC-71 and MD-3 and samples M-23 and MD-4 (both pairs from SDG 249697), samples M-65 and MD-5 (from SDG 249949), samples M-11 and MD-1 (from SDG 250101), samples M-84 and MD-2 (from SDG 250139), samples PC-128 and MD-3 (from SDG 258305), samples PC-71 and MD-4 (from SDG 258410), samples M-11 and MD-1 (from SDG 258563), and samples M-12A and MD-2 (from SDG 258623) samples M-95 and MD-1 (from SDGs 264580 and 270339), samples PC-37 and MD-3 (from SDG 264580), samples M-25 and MD-4 (from SDG 264774), samples M-84 and MD-2 (from SDG 264946), samples PC-54 and MD-3 (from SDG 270339), samples M-57A and MD-4 (from SDG 270390), samples M-34 and MD-5 (from SDG 270439), samples M-36 and MD-2 (from SDG 270567), samples M-134 and DUPLICATE (from SDG 271048), samples MW-132 and DUPLICATE (from SDG 271121), samples M-103 and DUPLICATE (from SDG 271400), and samples TR-4 and DUPLICATE (from SDG 271465) were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

		Concentra	tion (mg/L)				
SDG	Analyte	PC-71	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
249697	Chromium	0.39	0.39	0 (≤30)	-	-	-

		Concentrat	ion (mg/L)				
SDG	Analyte	M-23	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
249697	Chromium	0.77	0.80	4 (≤30)	-	-	-

		Concentra	tion (mg/L)				
SDG	Analyte	M-65	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
249949	Chromium	35	35	0 (≤30)	-	-	-

		Concentra	tion (mg/L)				
SDG	Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
250101	Chromium	3.1	3.0	3 (≤30)	-	-	-

		Concentra	tion (mg/L)				
SDG	Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
250139	Chromium	0.065	0.067	3 (≤30)	-	-	-
		Concentrat	tion (mg/L)	RPD	Difference		
SDG	Analyte	PC-128	MD-3	(Limits)	(Limits)	Flag	A or P
258305	Chromium	0.16	0.16	0 (≤30)	-	-	-
	T				· · · · · · · · · · · · · · · · · · ·		
		Concentrat	tion (mg/L)	RPD	Difference		
SDG	Analyte	PC-71	MD-4	(Limits)	(Limits)	Flag	A or P
258410	Chromium	0. 73	0.46	45 (≤30)	<u>-</u>	J (all detects)	А
	Г	<del></del>		<u> </u>			1
		Concentral	tion (mg/L)	RPD	Difference		
SDG	Analyte	M-11	MD-1	(Limits)	(Limits)	Flag	A or P
258563	Chromium	3.6	3.7	3 (≤30)	-	-	-
<u> </u>		T		<u> </u>			T 1
		Concentrat	tion (mg/L)	RPD	Difference		
SDG	Analyte	M-12A	MD-2	(Limits)	(Limits)	Flag	A or P
258623	Chromium	13	13	0 (≤30)	•	-	-
<u> </u>		· · · · · · · · · · · · · · · · · · ·					
		Concentrat	ion (mg/L)	RPD	Difference		
SDG	Analyte	M-95	MD-1	(Limits)	(Limits)	Flag	A or P
264580	Chromium	1.2	1.2	0 (≤30)	~	•	
		Concentrat	ion (mg/L)	RPD	Diff		
SDG	Analyte	PC-37	MD-3	(Limits)	Difference (Limits)	Flag	A or P
264580	Chromium	0.20	0.20	0 (≤30)	-	-	-
		Concentrat	ion (mg/L)	RPD	D:##=#===		
SDG	Analyte	MD-25	MD-4	(Limits)	Difference (Limits)	Flag	A or P
264774	Chromium	13	13	0 (≤30)	-	-	-

							1
		Concentra	tion (mg/L)	RPD	Difference		
SDG	Analyte	MD-84	MD-2	(Limits)	(Limits)	Flag	A or P
264946	Chromium	0.042	0.041	-	0.001 (≤0.020)	-	-
		Concentra	tion (mg/L)				
SDG	Analyte			RPD (Limits)	Difference	Flore	AorP
350	Allalyte	MD-95	MD-1	(Linits)	(Limits)	Flag	AOFP
270339	Chromium	1.1	1.0	10 (≤30)	-	-	-
		Concentra	tion (mg/L)				
SDG	Analyte	PC-54**		RPD (Limits)	Difference (Limits)	Flag	A or P
	Analyte		MD-3	(Cilitie)	(Limits)	Flag	AGIF
270339	Chromium	1.8	1.8	0 (≤30)	-	-	
		Concentra	tion (mg/L)				
SDG	Analyte	M-57A	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
						1 109	1 7 011
270390	Chromium	0.075	0.076	-	0.001 (≤0.020)	-	-
		Concentra	tion (mg/L)				
SDG	Analyte	M-34	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
				(=,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		9	7.0
270439	Chromium	0.075	0.076	-	0.001 (≤0.020)	-	-
f							
		Concentra	tion (mg/L)				
SDG	Analyte	M-36	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
					(26)		A 0.1
270567	Chromium	32	32	0 (≤30)	-	-	-
f=====================================							
		Concentrat	tion (mg/L)				
SDG	Analyte	M-134	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271048	Chromium	0.10	0.12	18 (≤30)	-	-	-
		Concentrat	tion (mg/l )				
SDG	Analyte			RPD (Limits)	Difference (Limits)	Flag	AorP
		M-132	DUPLICATE		(ciiiits)	ı iay	AUF
271121	Chromium	0.081	0.094	15 (≤30)	-	-	-

		Concentrat	tion (mg/L)				
SDG	Analyte	TR-4	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271465	Chromium	0.030	0.028	-	0.002 (≤0.010)	-	-

### 2008 - 2009 Annual Remedial Performance Sampling

Chromium - Data Qualification Summary - SDGs 249697, 249779, 249900, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265481, 265658, 270339, 270369, 270376, 270390, 270439, 270442, 270531, 270567, 270578, 270579, 270639, 270708, 270815, 271048, 271121, 270704, 270794, 270845, 270989, 270992, 271160, 271248, 271400, 271465, 271624, 271337, 270628, 271066, 271687, 271791, 271832, 271854, 271999

SDG	Sample	Analyte	Flag	A or P	Reason
258410	PC-71 MD-4	Chromium	J (all detects)	Α	Field duplicates (RPD)

#### 2008 - 2009 Annual Remedial Performance Sampling

Chromium - Laboratory Blank Data Qualification Summary - SDGs 249697, 249779, 249900, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265481, 265658, 270339, 270369, 270376, 270390, 270439, 270442, 270531, 270567, 270578, 270579, 270639, 270708, 270815, 271048, 271121, 270704, 270794, 270845, 270989, 270992, 271160, 271248, 271400, 271465, 271624, 271337, 270628, 271066, 271687, 271791, 271832, 271854, 271999

# No Sample Data Qualified in these SDGs

#### 2008 - 2009 Annual Remedial Performance Sampling

Chromium - Field Blank Data Qualification Summary - SDGs 249697, 249779, 249900, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265481, 265658, 270339, 270369, 270376, 270390, 270439, 270442, 270531, 270567, 270578, 270579, 270639, 270708, 270815, 271048, 271121, 270704, 270794, 270845, 270989, 270992, 271160, 271248, 271400, 271465, 271624, 271337, 270628, 271066, 271687, 271791, 271832, 271854, 271999

No Sample Data Qualified in these SDGs

# **ATTACHMENT B**

**Wet Chemistry Data Validation Report** 

Total Dissolved Solids by EPA Method 160.1 and Standard Method 2540C Nitrate as Nitrogen by EPA Method 300.0 Perchlorate by EPA Method 314.0 Nitrate/Nitrite as Nitrogen by EPA Method 353.2 Hexavalent Chromium by EPA SW 846 Method 7196 Chlorate and Nitrate as Nitrogen by EPA SW 846 Method 9056

## 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
249697 264774 264820 270390	M-37 M-12A M-95 M-37 EB-1	. Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
249697 264820	EB-2 M-44 FB-1 FB-1MS FB-1MSD	Hexavalent chromium	32 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
249779 253834 266452	PC-120 PC-133 M-6A ARP-1	Total dissolved solids	13 days	7 days	J- (all detects) UJ (all non-detects)	Р
249949	M-37 EB-1	Hexavalent chromium	31.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250101	MD-1	Hexavalent chromium	53.5 hours	24 hours	J- (all detects) R (all non-detects)	Р
250101	EB-2	Hexavalent chromium	35.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250101 270339	FB-1 M-12A	Hexavalent chromium	33.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250101 270567	M-100 M-11	Hexavalent chromium	33 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250139	MD-2	Total dissolved solids	43 days	7 days	J- (all detects) R (all non-detects)	Р
250139	M-84 MD-2	Hexavalent chromium	31 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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SDG	Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
250139 258305 264774 270567	EB-1 M-10 M-100 M-95	Hexavalent chromium	31.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250139 258623 264946	M-36 M-10	Hexavalent chromium	29.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
250139 264820 264946	M-10 M-11 M-36	Hexavalent chromium	30.5 hours	24 hours	J- (all detects) UJ (all non-detects)	P
253362 257010 271731	PC-119 ART-7 PC-59	Total dissolved solids	11 days	7 days	J- (all detects) UJ (all non-detects)	Р
257010 270708	HMW16 PC-24 PC-50 PC-98R PC-86 PC-90 PC-56 PC-56 PC-62 PC-62 PC-68 ARP-1 PC-97 PC-17 PC-17 PC-18 PC-55 L-635 L-637	Total dissolved solids	8 days	7 days	J- (all detects) UJ (all non-detects)	Р
258410	EB-1	Hexavalent chromium	80 hours	24 hours	J- (all detects) R (all non-detects)	Р
258410	M-37	Hexavalent chromium	75 hours	24 hours	J- (all detects) R (all non-detects)	Р
258563	M-84	Hexavalent chromium	50.5 hours	24 hours	J- (all detects) R (all non-detects)	P
258563	M-10	Hexavalent chromium	47.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
258563	EB-2	Hexavalent chromium	52 hours	24 hours	J- (all detects) R (all non-detects)	Р
258563	M-11 MD-1	Hexavalent chromium	49.75 hours	24 hours	J- (all detects) R (all non-detects)	Р
258623	M-12A MD-2	Hexavalent chromium	30 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

SDG	Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
258623 264946	M-84 MD-2 M-100	Hexavalent chromium	29.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
259063	PC-58	Total dissolved solids	9 days	7 days	J- (all detects) UJ (all non-detects)	Р
264580 270339 270567	M-95 MD-1 M-95 MD-1 MD-1MS MD-1MSD M-84	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
264580	FB-1	Hexavalent chromium	35.75 hours	24 hours	J- (all detects) UJ (all non-detects)	P
264727	I-U I-T	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	А
264774 270439 270442	M-66 M-33 M-31A M-50 M-34 MD-5 I-I	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	P
264946	M-100	Hexavalent chromium	30.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
265658 271066	M-23 M-67 M-66	Total dissolved solids	36 days	7 days	J- (all detects) R (all non-detects)	Р
270339	PC-129 PC-130 M-96 PC-129DUP	Total dissolved solids	18 days	7 days	J- (all detects) R (all non-detects)	Α
270339	M-44	Hexavalent chromium	32.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
270339	PC-124 PC-130	Nitrate as N	51 hours	48 hours	J- (all detects) UJ (all non-detects)	Р
270376	I-U	Total dissolved solids	15 days	7 days	J- (all detects) R (all non-detects)	Р
270376	I-G I-Q I-F I-N I-M	Total dissolved solids	17 days	7 days	J- (all detects) R (all non-detects)	Р

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SDG	Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
270439	M-11	Hexavalent chromium	24.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
270439	EB-2	Hexavalent chromium	27.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
270442	M-2A	Total dissolved solids	14 days	7 days	J- (all detects) UJ (all non-detects)	A
270531	M-10	Nitrate as N	7 days	48 hours	J- (all detects) R (all non-detects)	Р
270564	PC-112	Perchlorate	32 days	28 days	J- (all detects) UJ (all non-detects)	Р
270567	M-36 MD-2	Hexavalent chromium	32.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
270567	M-36 M-10 MD-2	Nitrate/Nitrite as N	43 days	28 days	J- (all detects) UJ (all non-detects)	Р
270845	H-58A H-48 MC-65 PC-21A MC-6 MC-7 MC-69	Total dissolved solids	23 days	7 days	J- (all detects) R (all non-detects)	Р
270992	M-39	Total dissolved solids	14 days	7 days	J- (all detects) UJ (all non-detects)	P
271048	M-65	Total dissolved solids	24 days	7 days	J- (all detects) R (all non-detects)	Р
271731	ART-6	Total dissolved solids	45 days	7 days	J- (all detects) R (all non-detects)	Р

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

## II. Calibration

#### a. Initial Calibration

All criteria for the initial calibration of each method were met for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2A criteria.

The balance check was not performed for Total Dissolved Solids in SDG 264727.

#### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2A criteria.

The balance check was not performed for Total Dissolved Solids in SDG 264727.

#### III. Blanks

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

SDG	Method Blank ID	Analyte	Concentration	Associated Samples
256589 261275	PB (prep blank)	Total dissolved solids	6.0 mg/L	ART-4 ARP-1 PC-18 PC-55

SDG	Method Blank ID	Analyte	Concentration	Associated Samples
258563 259063 265481	PB (prep blank)	Total dissolved solids	14 mg/L	PC-103 PC-98R PC-86 PC-90 PC-56 PC-58 PC-59 PC-60 PC-62 PC-63 PC-91 PC-97 PC-18 PC-55 L-635 M-92 M-97 I-K I-J I-Z I-I I-V MD-1 MW-K4 ARP-1 ARP-4A ARP-5A ARP-6B PC-53 PC-103 MW-K5 PC-55 L-635
261012	PB (prep blank)	Total dissolved solids	36 mg/L	ART-1 ART-2 ART-3 ART-4 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9
264727	MB (prep blank)	Total dissolved solids	12 mg/L	다. 다
265658	PB (prep blank)	Total dissolved solids	10 mg/L	M-23

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

Samples EB-1 (from SDGs 249949, 258410, 264774, 270390), EB-2 (from SDGs 250101, 258563, 264820, 270439), EB051909 (from SDG 270989), EB052009 (from SDG 271048), EB052109 (from SDG 271121), and EB052609 (from SDG 271248) were identified as equipment blanks. No contaminant concentrations were found in these blanks with the following exceptions:

IT	T				
SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
249900 249949	EB-1	8/5/09	Perchlorate Total dissolved solids	255 ug/L 18 mg/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 I-FDUP I-AA M-131 M-64 M-65 M-66 M-79 M-69 M-135 M-99 M-25 M-57A M-37 MD-5
250101 250123	EB-2	8/6/08	Perchlorate	9.8 ug/L	I-Z I-I I-V M-67 M-74 M-73 M-88 M-12A M-11 MD-1 M-92 M-97 M-31A M-50 M-34 M-35 M-19 M-39 M-68 M-61 I-K

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
258563	EB-2	11/5/08	Perchlorate Hexavalent chromium	127 ug/L 0.017 mg/L	M-92 M-97 M-31A M-52 M-50 M-34 M-35 M-19 M-39 M-68 M-61 I-K I-J I-Z I-I I-V M-84 M-10 M-11
264774	EB-1	2/3/09	Perchlorate	162 ug/L	I-AA M-64 M-65 M-66 M-79 M-69 M-135 M-131 M-57A M-99 M-25 M-37
264820	EB-2	2/4/09	Perchlorate	12 ug/L	M-92 M-97 M-31A M-52 M-50 M-34 M-35 M-19 M-39 M-68 M-61 M-67 M-73 M-74 M-73 M-88 I-V I-K I-J I-Z I-I

SDG	Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
270369 270376 270390	EB-1	5/5/09	Perchlorate	159 ug/L	M-5A I-O I-P I-H I-U I-T I-G I-G I-F I-N I-E I-M I-D I-C I-S I-L I-R I-B I-AR I-AA M-131 M-57A M-79 M-69 M-135 M-25 M-99 M-37 MD-4
270439 270442 270507	EB-2	5/6/09	Perchlorate	70 ug/L	M-92 M-97 M-33 M-31A M-52 M-50 M-21 M-34 M-35 M-19 M-39 M-68 M-74 M-73 M-88 M-11 M-12A M-13 MD-5 I-K I-J I-I I-Z I-V PC-77

Samples FB-1 (from SDGs 249697, 258305 264580, 270339), FB0151909 and FB051909-2 (from SDG 270989), FB M-39 (from SDG 270992), FB052009 (from SDG 271048), FB-CLDR-2 (from SDG 271066), FB052109 (from SDG 271121), FB052209 (from SDG 271160), FB052609 (from SDG 271248), FB052909 (from SDG 271337), FB060109 (from SDG 271400), FB060209 (from SDG 271465), and FB060409 (from SDG 271624) were identified as field blanks. No contaminant concentrations were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB052009	5/20/09	Perchlorate	4.1 ug/L	PC-64 M-65 M-134 DUPLICATE

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
258563	<b>M</b> -92	Perchlorate	884 ug/L	884J+ ug/L
258563	M-84	Hexavalent chromium	0.056 mg/L	0.056J+ mg/L
270369	M-5A	Perchlorate	397 ug/L	397J+ ug/L

No field blanks were identified in the other SDGs.

#### IV. 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.

## V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

SDG	DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
251027	PC-55DUP (PC-55)	Total dissolved solids	13.7 (≤10)	-	J (all detects) UJ (all non-detects)	Α

## VI. 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 with the following exceptions:

SDG	LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
250388	LCS3 (PC-120)	Perchlorate	129.0 (75-125)	-	<u>-</u>	J+ (all detects)	Р
251027	LCS (PC-55)	Total dissolved solids	77.4 (80-114)	-	-	J- (all detects) UJ (all non-detects)	Р
251181 256589	LCS1 (ART-6 ART-1 ART-2 ART-3 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9)	Total dissolved solids	125.7 (80-114)	-	•	J+ (all detects)	Р

#### VII. 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.

Although Total Dissolved Solids (TDS) were detected in sample FB-1 in SDG 264580, the laboratory reported the results as NA due to possible error in sample analysis. The field blank sample should not have high levels of TDS and the Specific Conductance test confirmed that the results did not match.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples PC-71 and MD-3 and samples M-23 and MD-4 (from SDG 249697), samples M-65 and MD-5 (from SDG 249949), samples M-11 and MD-1 (from SDG 250101), samples M-84 and MD-2 (from SDG 250139), samples PC-128 and MD-3 (from SDG 258305), samples PC-71 and MD-4 (from SDG 258410), samples M-11 and MD-1 (from SDG 258563), samples M-12A and MD-2 (from SDG 258623), samples M-95 and MD-1 and PC-37 and MD-3 (from SDG 264580), samples M-25 and MD-4 (from SDG 264774), samples M-84 and MD-2 (from SDG 264946), samples M-95 and MD-1 and samples PC-54 and MD-3 (from SDG 270339), samples M-36 and MD-2 (from SDG 270390), samples M-34 and MD-5 (from SDG 270439), samples M-36 and MD-2 (from SDG 270567), samples M-134 and DUPLICATE (from SDG 271048), samples MW-132 and

DUPLICATE (from SDG 271121), samples M-125 and DUPLICATE (from SDG 271160), samples M-142 and DUPLICATE (from SDG 271248), samples M-103 and DUPLICATE (from SDG 271400), samples TR-4 and DUPLICATE (from SDG 271465), and samples H-11 and DUPLICATE (from SDG 271624) were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

		Concer	Concentration				
SDG	Analyte	PC-71**	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
249697	Total dissolved solids	8270 mg/L	8050 mg/L	3 (≤30)	-	-	-
249697	Perchlorate	468000 ug/L	451000 ug/L	4 (≤30)	-	-	-

		Concer	Concentration				
SDG	Analyte	M-23**	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
249697	Total dissolved solids	5260 mg/L	4720 mg/L	11 (≤30)	-	-	-
249697	Perchlorate	493000 ug/L	514000 ug/L	4 (≤30)	-	-	-

		Conce	Concentration				
SDG	Analyte	M-65	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
249949	Total dissolved solids	17500 mg/L	18300 mg/L	4 (≤30)	-	-	-
249949	Perchlorate	1410000 ug/L	1400000 ug/L	1 (≤30)	-	_	-

		Concer	ntration				
SDG	Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
250101	Total dissolved solids	3260 mg/L	3200 mg/L	2 (≤30)	-	_	_
250101	Perchlorate	43100 ug/L	43400 ug/L	1 (≤30)	-	-	-

		Concentration					
SDG	Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
250139	Hexavalent chromium	0.065 mg/L	0.070 mg/L	7 (≤30)	-	-	_
250139	Total dissolved solids	1210 mg/L	958 mg/L	23 (≤30)	-	-	-
250139	Perchlorate	9360 ug/L	9260 ug/L	0 (≤30)	-	-	-

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		Concer	Concentration				
SDG	Analyte	PC-128	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
258305	Total dissolved solids	5620 mg/L	5400 mg/L	4 (≤30)	-	-	-
258305	Perchlorate	187000 ug/L	231000 ug/L	21 (≤30)	-	-	_

		Concer	Concentration		Difference		
SDG	Analyte	PC-71	MD-4	RPD (Limits)	(Limits)	Flag	A or P
258410	Total dissolved solids	8650 mg/L	7960 mg/L	8 (≤30)	-	-	-
258410	Perchlorate	577000 ug/L	457000 ug/L	19 (≤30)	-	-	_

		Concer	Concentration				
SDG	Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
258563	Hexavalent chromium	3.38 mg/L	3.58 mg/L	6 (≤30)	-	-	-
258563	Total dissolved solids	3520 mg/L	3620 mg/L	3 (≤30)	-	-	-
258563	Perchlorate	50400 ug/L	48900 ug/L	3 (≤30)	-	-	-

		Concer	Concentration				
SDG	Analyte	M-12A	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
258623	Hexavalent chromium	13.7 mg/L	14.7 mg/L	7 (≤30)	-	-	-
258623	Total dissolved solids	8100 mg/L	7950 mg/L	2 (≤30)	-	-	-
258623	Perchlorate	289000 ug/L	288000 ug/L	0 (≤30)	-	-	-

		Concer	Concentration				
SDG	Analyte	M-95	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
264580	Hexavalent chromium	1.30 mg/L	1.26 mg/L	3 (≤30)	-	-	-
264580	Total dissolved solids	7510 mg/L	7560 mg/L	1 (≤30)	-	-	-
264580	Perchlorate	478000 ug/L	462000 ug/L	3 (≤30)	-	-	-

		Concer	Concentration				
SDG	Analyte	PC-37	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
264580	Total dissolved solids	7370 mg/L	6750 mg/L	9 (≤30)	-	-	-

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	Concentration				,		
SDG	Analyte	PC-37	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
264580	Perchlorate	324000 ug/L	326000 ug/L	1 (≤30)	-	-	-

		Concentration					
SDG	Analyte	MD-25	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
264774	Total dissolved solids	9080 mg/L	9480 mg/L	4 (≤30)	-	-	-
264774	Perchlorate	441000 ug/L	442000 ug/L	0 (≤30)	-	-	-

		Concentration					
SDG	Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
264946	Hexavalent chromium	0.039 mg/L	0.044 mg/L	12 (≤30)	-	- -	-
264946	Total dissolved solids	980 mg/L	972 mg/L	1 (≤30)	-	-	-
264946	Perchlorate	6970 ug/L	7030 ug/L	1 (≤30)	-	-	<u>-</u>

		Concentration					
SDG	Analyte	M-95**	MD-1**	RPD (Limits)	Difference (Limits)	Flag	A or P
270339	Total dissolved solids	6950 mg/L	7240 mg/L	4 (≤30)	-	-	-
270339	Hexavalent chromium	1.14 mg/L	1.14 mg/L	0 (≤30)	-	-	-
270339	Perchlorate	445000 ug/L	464000 ug/L	4 (≤30)	-	<del>-</del> .	-

		Concentration		RPD	Difference		
SDG	Analyte	PC-54**	MD-3	(Limits)	(Limits)	Flag	A or P
270339	Total dissolved solids	6050 mg/L	6280 mg/L	4 (≤30)	-	~	-
270339	Perchlorate	226000 ug/L	237000 ug/L	5 (≤30)	-	-	-

		Concentration					
SDG	Analyte	M-57A	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
270390	Total dissolved solids	3260 mg/L	3200 mg/L	2 (≤30)	-	-	-
270390	Perchlorate	26200 ug/L	25200 ug/L	4 (≤30)	-	-	-

		Concer	Concentration				
SDG	Analyte	M-34	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
270439	Total dissolved solids	9200 mg/L	7350 mg/L	22 (≤30)	-	-	-
270439	Perchlorate	1500000 ug/L	1580000 ug/L	5 (≤30)	-	-	-

		Concer	ntration				
SDG	Analyte	M-36	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
270567	Chlorate	7040000 ug/L	7420000 ug/L	5 (≤30)	-	-	-
270567	Perchlorate	1560000 ug/L	1450000 ug/L	7 (≤30)	-	-	-
270567	Hexavalent chromium	35.0 mg/L	35.0 mg/L	0 (≤30)	-	-	-
270567	Nitrate/Nitrite as N	52.7 mg/L	51.4 mg/L	2 (≤30)	-	-	-
270567	Total dissolved solids	11700 mg/L	11900 mg/L	2 (≤30)	-	-	-

		Concentration		RPD	Difference		
SDG	Analyte	M-134	DUPLICATE	(Limits)	(Limits)	Flag	A or P
271048	Total dissolved solids	3000 mg/L	2850 mg/L	5 (≤30)	-	<del>-</del>	-
271048	Perchlorate	123000 ug/L	125000 ug/L	2 (≤30)	-	-	-

		Concentration		RPD	Difference		
SDG	Analyte	M-13	DUPLICATE	(Limits)	(Limits)	Flag	AorP
271121	Total dissolved solids	1482 mg/L	1584 mg/L	7 (≤30)	-	-	-
271121	Perchlorate	7410 ug/L	9670 ug/L	26 (≤30)	-	-	-

		Concentration					
SDG	Analyte	M-125	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271160	Total dissolved solids	14700 mg/L	15400 mg/L	5 (≤30)	-	-	-
271160	Perchlorate	842 ug/L	812 ug/L	4 (≤30)	-	-	-

		Concentration					
SDG	Analyte	M-142	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271248	Total dissolved solids	2938 mg/L	2814 mg/L	5 (≤30)	-	-	-

		Concer	ntration				
SDG	Analyte	M-142	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271248	Perchlorate	24700 ug/L	24800 ug/L	0 (≤30)	•	-	-

		Concer	Concentration				
SDG	Analyte	M-103	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271400	Total dissolved solids	1970 mg/L	2000 mg/L	2 (≤30)	-	-	-
271400	Perchlorate	264 ug/L	260 ug/L	2 (≤30)	-	-	-

		Concer	ntration				
SDG	Analyte	TR-4	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271465	Total dissolved solids	874	888	2 (≤30)		-	_

		Concer	ntration				
SDG	Analyte	H-11	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
271624	Total dissolved solids	634	520	20 (≤30)	-	-	-

## 2008 - 2009 Annual Remedial Performance Sampling

Wet Chemistry - Data Qualification Summary - SDG 248147, 249697, 249779, 249900, 249949, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 253362, 253834, 256589, 257010, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 261012, 261275, 263577, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265658, 266452, 267194, 268707, 269377, 270339, 270369, 270376, 270390, 270439, 270442, 270507, 270531, 270564, 270567, 270578, 270579, 270628, 270639, 270704, 270708, 270794, 270815, 270845, 270857, 270989, 270992, 271048, 271066, 271121, 271160, 271248, 271325, 271337, 271400, 271465, 271624, 271687, 271731, 271791, 271832, 271854, 271999

	T				I
SDG	Sample	Analyte	Flag	A or P	Reason
249697 249949 250101 250139 258305 258563 258623 264580 264774 264820 270339 270390 270439 270567	M-95 MD-1 FB-1 M-37 EB-1 M-12A EB-2 M-10 M-100 M-84 M-36 M-11 MD-2 M-95 MD-1 M-44 FB-1 M-37 EB-1 M-11 EB-2 M-36 M-84 M-100 MD-2 M-95 M-44 FB-1 M-37 EB-1 M-100 MD-2 M-95 M-44 FB-1 M-37 EB-1 M-100 MD-2 M-95 M-44 FB-1 M-37 EB-1 M-12A M-11 EB-2 M-36 M-84 M-100 MD-2 M-95 M-44 FB-1 M-37 EB-1 M-12A M-11 EB-2 M-36 M-84 M-100 MD-2 M-95 M-100 M-95	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

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SDG	Sample	Analyte	Flag	A or P	Reason
249779 253362 253834 257010 259063 266452 270708 270992 270628	PC-120 PC-133 HMW16 PC-24 PC-50 M-39 PC-119 M-6A ART-7 ARP-1 PC-98R PC-86 PC-90 PC-56 PC-58 PC-59 PC-60 PC-62 PC-62 PC-62 PC-62 PC-97 PC-17 PC-91 PC-91 PC-97 PC-17 PC-18 PC-55 L-635 L-637 PC-58	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times
250101 258410 258563	MD-1 EB-1 M-37 M-84 EB-2 M-11 MD-1	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times
250139 264774 265658 270376 270439 270442 271048 270628 271066	M-66 M-23 I-U I-G I-Q I-F I-N I-R M-33 M-31A M-50 M-50 M-55 I-I I-V M-65 ART-6 M-65 ART-6 M-67 M-66 MD-2	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times
264727 270339	I-U I-T PC-129 PC-130 M-96	Total dissolved solids	J- (all detects) R (all non-detects)	A	Technical holding times
270339	PC-124 PC-130	Nitrate as N	J- (all detects) UJ (all non-detects)	Р	Technical holding times

SDG	Sample	Analyte	Flag	A or P	Reason
270531	M-10	Nitrate as N	J- (all detects) R (all non-detects)	Р	Technical holding times
270564	PC-112	Perchlorate	J- (all detects) UJ (all non-detects)	Р	Technical holding times
270567	M-36 M-10 MD-2	Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	Р	Technical holding times
270579	M-2A	Total dissolved solids	J- (all detects) UJ (all non-detects)	А	Technical holding times
251027	PC-55	Total dissolved solids	J (all detects) UJ (all non-detects)	А	Duplicate sample analysis (RPD)
250388	PC-120	Perchlorate	J+ (all detects)	Р	Laboratory control samples (%R)
251027	PC-55	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Laboratory control samples (%R)
251181 256589	ART-6 ART-1 ART-2 ART-3 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-120 PC-121 PC-133 ART-9	Total dissolved solids	J+ (all detects)	Р	Laboratory control samples (%R)

#### 2008 - 2009 Annual Remedial Performance Sampling

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 248147, 249697, 249779, 249900, 249949, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 253362, 253834, 256589, 257010, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 261012, 261275, 263577, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265658, 266452, 267194, 268707, 269377, 270339, 270369, 270376, 270390, 270439, 270442, 270507, 270531, 270564, 270567, 270578, 270579, 270628, 270639, 270704, 270708, 270794, 270815, 270845, 270857, 270989, 270992, 271048, 271066, 271121, 271160, 271248, 271325, 271337, 271400, 271465, 271624, 271687, 271731, 271791, 271832, 271854, 271999

No Sample Data Qualified in these SDGs

#### 2008 - 2009 Annual Remedial Performance Sampling

Wet Chemistry - Field Blank Data Qualification Summary - SDG 248147, 249697, 249779, 249900, 249949, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 253362, 253834, 256589, 257010, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 261012, 261275, 263577, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265658, 266452, 267194, 268707, 269377, 270339, 270369, 270376, 270390, 270439, 270442, 270507, 270531, 270564, 270567, 270578, 270579, 270628, 270639, 270704, 270708, 270794, 270815, 270845, 270857, 270989, 270992, 271048, 271066, 271121, 271160, 271248, 271325, 271337, 271400, 271465, 271624, 271687, 271731, 271791, 271832, 271854, 271999

SDG	Sample	Analyte	Modified Final Concentration	A or P
258563	M-92	Perchlorate	884J+ ug/L	Α
258563	M-84	Hexavalent chromium	0.056J+ mg/L	А
270369	M-5A	Perchlorate	397J+ ug/L	А



#### LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Tronox, LLC P.O. Box 55

August 5, 2009

Henderson NV 89009

ATTN: Ms. Susan Crowley

SUBJECT: 2009 Annual Remedial Performance Sampling, Data Validation

Dear Ms. Crowley,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 19, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### **LDC Project # 21040:**

270639, 270708

#### SDG#

#### **Fraction**

263577, 264580, 264598, 264727, 264774, 264820, 264946, 264958, 265481, 265658, 266452, 267194, 268707, 269377, 270339, 270369, 270376, 270390, 270439, 270442, 270507, 270564, 270578, 270579,

Chromium, Wet Chemistry

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance, May 2006
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto Operations Manager/Senior Chemist

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Level 2A/4	SE	Water/Soil	26	78	8	76	764	264	264	764	265	265	266	267	265	265	270	270	270	270	270	270	270	270	270	270	270	270	270				T/LR
		3.334																															
	PC	Matrix:	∀	В	ပ		Ш	ш	9	王		_	소		Σ	z	0			ø	~	s	┌	5	>	3	×	<b>&gt;</b>	Z	_	$\dashv$	$\dashv$	Total
	لڌ	-2		_1				$\equiv$		<u> </u>							기	ᆜ		긔	-	<u> </u>	<u> </u>		1	<u> </u>	<u> </u>		17		<u> </u>	<u></u>	ို

Attachment 1

626 pages-DL

# 2009 Annual Remedial Performance Sampling Data Validation Reports LDC# 21040

Chromium



## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 2, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

FB-1MSD

Sample Delivery Group (SDG): 264580

## Sample Identification

PC-123 MD-3
PC-124 FB-1
PC-125 M-48MS
PC-126 M-48MSD
PC-127 FB-1MS

PC-128 PC-129

PC-130

PC-131

PC-132

M-96

PC-54

M-48

M-44

PC-71

PC-72

PC-73

PC-37

M-95

MD-1

#### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-1 was identified as a field blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-95 and MD-1 and samples PC-37 and MD-3 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)				
Analyte	M-95	MD-1 (Li		Difference (Limits)	Flag	A or P
Chromium	1.2	1.2	0 (≤30)	-	-	-

	Concentrat	tion (mg/L)	-			
Analyte	PC-37	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	0.20	0.20	0 (≤30)	-	-	-

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264580

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264580

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264580

No Sample Data Qualified in this SDG

18				- 9							
SDG#:	:21040B4 <b>\</b> #:_264580 atory:_MWH Laboratories	/Ai	LIDATION		PLET evel		ESS WOF	₹KS⊦	łEET		Date: ユ / \ Page: \ of \ Reviewer: _A / 2nd Reviewer: _ 1/^
METH	OD: Chromium (EPA SW 8	846	Method 60	10B)							
	amples listed below were re tion findings worksheets.	evie <sup>®</sup>	wed for eac	h of the fo	iwollc	ng va	ılidation are	eas. Va	alidation	findi	ings are noted in attache
	Validation Ar	rea							Comme	nts	
1.	Technical holding times			A	Samp	oling da	ates: 2_	2	09		
II.	Calibration			N							
III.	Blanks			A							
IV.	ICP Interference Check Sample	ie (IC	CS) Analysis	N							
V.	Matrix Spike Analysis	_		Α	2	<u> </u>	MSD				
VI.	Duplicate Sample Analysis			2							
VII.	Laboratory Control Samples (L	 .CS)		A	L	<u> </u>					
VIII.	Internal Standard (ICP-MS)	_		N	2	o t	<u>u4:1:</u>	ted			
IX.	Furnace Atomic Absorption QC	 :		7	_/	·	l		3		
Χ.	ICP Serial Dilution			N	7	o t	review		1_	Lun	-l 2A
XI.	Sample Result Verification			N					70		
XII.	Overall Assessment of Data			A					- A		
XIII.	Field Duplicates			5 W	0	= 1	9+20	り゛	= 18+	2 \	
XIV.	Field Blanks			20	FF	3 - :	22				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	o compounds			D = D TB =	Ouplicate Trip bla Equipm			
Validate	ed Samples:	<u></u>	, <u>.</u> L								
1 1	PC-123 1	11	M-96			21	WD-3 ₽ -		3	31	
		12	PC-54			22	FB-1		3	32	
		13	M-48			23	M-48MS			33	
			M-44			24	M-48MSD			34	
			PC-71			25	FB-1MS			35	

	AU	ر بر				
1	PC-123	11	M-96	21	MD-3 <sup>6</sup> 2	31
2	PC-124	12	PC-54	22	FB-1	32
3	PC-125	13	M-48	23	M-48MS	33
4	PC-126	14	M-44	24	M-48MSD	34
5	PC-127	15	PC-71	25	FB-1MS	35
6	PC-128	16	PC-72	26	FB-1MSD	36
7	PC-129	17	PC-73	27	MB	37
8	PC-130	18	PC-37 <sup>7)</sup> 2	28		38
9	PC-131		M-95 <sup>15</sup> '	29		39
10	PC-132	1	MD-1 <sup>O</sup> '	30		40

Notes:	 	 	

LDC#:	21040B4
SDG#:	See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page:_	_of
Reviewer:	41
2nd Reviewer:	

METHOD: Metals (EPA Method 6010B)

(YN NA (YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	(4.20)	
Compound	19	20	(≤ 30) RPD	
Chromium	1.2	1.2	0	

	Concentra	Concentration (mg/L)		
Compound	18	21	(≤ 30) RPD	
Chromium	0.20	0.20	0	

V:\FiELD DUPLICATES\FD\_inorganic\21040B4.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 2, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264598

## Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

#### Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-1 (from SDG 264580) was identified as a field blank. No chromium was found in this blank.

### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

SDG	#: <u>21040C4</u> #:_ <u>264598</u> atory:_ <u>MWH_Laboratorie</u>	-	LIDATIOI -		PLETE Level 2		SS WORKSHEE	Т	Date: ⊋ ( 1   oe Page: _1 of _1 Reviewer: 2nd Reviewer:	
METH	HOD: Chromium (EPA S	SW 84	6 Method 60	)10B)					Ziid Neviewer.	
	amples listed below wer tion findings worksheets		ewed for ead	ch of the f	following	g va	lidation areas. Valida	tion fin	dings are noted in attached	
	Validation	n Area					Com	ments		
l.	Technical holding times			Α	Samplii	ng da	ates: 2 2 0 0			
II.	Calibration			N						
III.	Blanks			Α						
IV.	ICP Interference Check Sa	ımple (I	CS) Analysis	N						
V.	Matrix Spike Analysis				ζ 4	, , ,	~ 264580			
VI.	Duplicate Sample Analysis	3		N	\					
VII.	Laboratory Control Sample	s (LCS	)	A	LC	S				
VIII.	Internal Standard (ICP-MS	Internal Standard (ICP-MS)				Not Utilized				
IX.	Furnace Atomic Absorption	7	\ \							
Χ.	ICP Serial Dilution	N	Not reviewed for bent 2A							
XI.	Sample Result Verification	N	U							
XII.	Overall Assessment of Da	ta		A		,				
XIII.	Field Duplicates			12						
XIV.	Field Blanks			20	FB	٠. ا	FB-1 (from 2	645	80)	
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le	R = Rin	o compound sate eld blank	ds detecte	∋d	D = Duplicate TB = Trip blank EB = Equipment bl	ank		
	ed Samples:	<u>u</u>	watz							
1	ART-1	11	SF-1		2	1		31		
2	ART-2	12	PC-117		2	2		32		
3	ART-3	13	PC-118		2	3		33		
4	ART-4	14	PC-119		2	4		34_		
5	ART-6	15	PC-120		2	5		35		
6	ART-7	16	PC-121		2	6		36		
1 2 3 4 5 6 7	ART-8	17	PC-133 <b>2</b>		2	7		37		
8	PC-99R2/R3	18	ART-9		2	8		38		
ا ا	DC 115D	10	418		2	آ ه		30		

10 PC-116R

Notes:\_

20

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 3, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264727

#### Sample Identification

1-0

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-R

-17

I-L I-B

I-AR

I-BMS

I-BMSD

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### 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.

#### IV. Blanks

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

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### 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 this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

#### XII. Sample Result Verification

All sample result verifications were acceptable.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264727

No Sample Data Qualified in this SDG

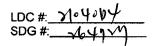
2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264727

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264727

No Sample Data Qualified in this SDG

SDG	#: <u>21040D4</u> #: <u>264727</u> :atory: <u>MWH Laboratories</u>		LIDATIOI -	N COMP	PLETEN <del>Level</del> 4 lage	IESS	S WORKSH	IEET	Date: 7/29/°() Page:
METH	HOD: Chromium (EPA S\	N 84	6 Method 60	010B)	•				2nd Reviewer:
	amples listed below were tion findings worksheets.		ewed for ead	ch of the f	ollowing	valida	ition areas. V	alidation findi	ngs are noted in attached
	Validation	Area						Comments	
<u>I.</u>	Technical holding times			A	Sampling	dates:	2/3/09		
II.	Calibration			A					
111.	Blanks			A					
IV.	ICP Interference Check San	nple (I	CS) Analysis	1					
V.	Matrix Spike Analysis			A,	Zm	·/pic	g		
VI.	Duplicate Sample Analysis			N	)	<i>,</i> .			
VII.	Laboratory Control Samples	(LCS	)	A	Lus	/20	5 <b>7</b> )		
VIII.	Internal Standard (ICP-MS)			N	7 W.	ĹŰ	Tilizes		
IX.	Furnace Atomic Absorption	QC		N	7		<u> </u>	···	
Χ.	ICP Serial Dilution			N	Not	bud	med		
XI.	Sample Result Verification			A		,			
XII.	Overall Assessment of Data			A	<u> </u>				
XIII.	Field Duplicates			ν,					
XIV.	Field Blanks			$\vdash \hspace{0.1cm}					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	s detected		D = Duplicate TB = Trip bla EB = Equipm	nk	
	ed Samples:								
1	I-O	11	I-M		21		MB	31	
2	I-P	12	I-D		22			32	
3	I-H	13	I-C		23			33	
4	I-U	14	I-S		24			34	
5	I-T	15	I-R		25			35	
6	I-G	16	I-L		26			36	
7	I-Q	17	I-B		27			37	
8	I-F	18	I-AR		28			38	
9	I-N	19	I-BMS		29			39	
10	I-E	20	I-BMSD		30			40	
Notes									



#### **VALIDATION FINDINGS CHECKLIST**

Page: \_\_of \_\_ Reviewer: \_\_\_\_ 2nd Reviewer: \_\_\_\_

Method: Metals (EPA SW 846 Method 6010B/7000/6020)

Wethod: Metals (EPA SW 846 Method 6010B/7000/6020	<u> </u>	<del></del>	<del>,                                     </del>	
Validation Area	Yes	No	NA	Findings/Comments
All technical holding times were met.	1			
Cooler temperature criteria was met.	/			
Were all isotopes in the tuning solution mass resolution within 0.1 amu?			1	
Were %RSD of isotopes in the tuning solution ≤5%?			/	
Were all instruments calibrated daily, each set-up time?	5			
Were the proper number of standards used?	1			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	1			
Were all initial calibration correlation coefficients > 0.995?	1			
Was a method blank associated with every sample in this SDG?	V			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		<b>✓</b>		
Warantas a sacs shall be at 15 as 500 511 st				
Were ICP interference check samples performed daily?	1			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	1			
Middle Concentration and the state of the st	in the contract of the	Marila		
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	\script{\sint\sint\sinti\sint\sint\sint{\sint\sinitit{\sint\sint\sint\sint\sinti\sint\sint\sin			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	/			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	/			
Was an LCS anaylzed for this SDG?	1			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	_			

LDC #: 10 49 4 SDG #: 10 49 7

#### **VALIDATION FINDINGS CHECKLIST**

Validation Area	Yes	No	NA	Findings/Comments
If MSA was performed, was the correlation coefficients > 0.995?			S	
Do all applicable analysies have duplicate injections? (Level IV only)			_	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			_	
Were analytical spike recoveries within the 85-115% OC limits?	5000 minus	20 51 71 20 11 11 1		Company of the December of the Company of the Compa
		311		
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		/		
Were all percent differences (%Ds) < 10%?			\	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.	405200 H110	esteroni re-		Migra, of the distribution of the control of the co
Saletan Second refreshment was also because the second				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?	s gradena	anire et a a		THE RESERVE OF THE PROPERTY OF
Were performance evaluation (PE) samples performed?			_	
Were the performance evaluation (PE) samples within the acceptance limits?			$\angle$	
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1			
Overall assessment of data was found to be acceptable.				
Field duplicate pairs were identified in this SDG.		/		
Target analytes were detected in the field duplicates.			1	
	<b>1</b>			
Field blanks were identified in this SDG.		$\checkmark$	7	
Target analytes were detected in the field blanks.				

100 # 100 # 50ds

# VALIDATION FINDINGS WORKSHEET Initial and Continuing Calibration Calculation Verification

Page: of Reviewer: WH

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found × 100 True

Where, Found \* concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution True \* concentration (in ug/L) of each analyte in the ICV or CCV source

					Receiculated	Reported	Accentable
Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	%R	%R	(N/X)
722	ICP (initial calibration)	か	0.01	01	001	٥٥	7
	GFAA (initial calibration)						
	CVAA (Initial calibration)						
3	ICP (Continuing calibration)	5	Los	or S	101	(0)	7
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
	ICP/MS (initial calibration)						
	ICP/MS (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

paopole # DOT

# VALIDATION FINDINGS WORKSHEET **Level IV Recalculation Worksheet**

Page: Lof Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found × 100 True

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result).

True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = <u>IS-DI</u> × 100 (S+D)/2

Where, S = Origina sample concentration

D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = [1-SDR] × 100

Where, i = initial Sample Result (mg/L) SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	%R/RPD/%D	%R/RPD/%D	Acceptable (Y/N)
7557	ICP interference check	3	0,56	\$ 0	102	70)	<u>\</u>
3	Laboratory control sample		9,	٥٥٠	90)	00)	
19	Matrix spike		(SSR-SR) 0.97 )	25~	41.7	49.4	
CT \ Duplicate	Duplicate	7	1.1	d~,	9	MP	آ
7,	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:	104094
SDG #:	164747

#### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	0f
Reviewer:	5
2nd reviewer:	l-
	7

METH	OD: Tra	ce Metals (EPA SW 846 Me	thod 6010/7000)	/
Please N N N N		Have results been reporte	stions answered "N". Not applicable questions are identified as " d and calculated correctly? rated range of the instruments and within the linear range of the ow the CRDL?	
Detect	ed analy	te results for	were recalculated an	d verified using the
	ng equa			
Concent	tration =	(RD)(FV)(Dil) (In. Vol.)(%S)	Recalculation:	
RD	=	Raw data concentration	# W = 1-53 mg/ x 20 = 30.1	mr l
FV	=	Final volume (ml)	1 /V / 70.x	'' 8/V
in. Vol.	=	Initial volume (ml) or weight (G)		, •
Dil	=	Dilution factor		
%S	<u>***</u>	Decimal percent solids		

Sample ID	Analyte	Reported Concentration ( W ) U)	Calculated Concentration	Acceptable (Y/N)
	W	31	3)	У
		,		/
<u> </u>	$\sim$			<b>Y</b>
· · · · · · · · · · · · · · · · · · ·				
·			200	
			<del></del>	
,				
			:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 3, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264774

#### Sample Identification

I-AA

M-64

M-65

M-66

M-79

M-69

M-135

M-131

M-57A

M-99

M-25

M-37

MD-4

EB-1

M-135MS

M-135MSD

#### Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-1 was identified as an equipment blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

Samples M-25 and MD-4 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	tion (mg/L)				
Analyte	M-25	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	13	13	0 (≤30)	-	-	-

#### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264774

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264774

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264774

No Sample Data Qualified in this SDG

SDG#	:21040E4 :: 264774 atory: MWH Laboratories		LIDATION		LETENESS Vevel 2A	WO	RKS	HEET	Date: ¬ \ \ \ \ Page: \ \ \ of \ \ Reviewer: _ A\ \ 2nd Reviewer: _ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
/IETH	OD: Chromium (EPA SV	V 846	Method 60	10B)					
	amples listed below were ion findings worksheets.	revie	ewed for eac	ch of the fo	lowing validation	on ar	eas. \	/alidation find	lings are noted in attache
	Validation	Area						Comments	
I.	Technical holding times			A	Sampling dates:	2.	3	107	
II.	Calibration			N					
111.	Blanks			A					
IV.	ICP Interference Check Sam	nple (IC	CS) Analysis	N					
V.	Matrix Spike Analysis			Δ	2 M5/2	151	2		111
VI.	Duplicate Sample Analysis			7					
VII.	Laboratory Control Samples	(LCS)		Δ	Lcs				
VIII.	Internal Standard (ICP-MS)			N	Nat U	<u> </u>	ize	4	
IX.	Furnace Atomic Absorption	QC_		2	V	L			
X.	ICP Serial Dilution			N	Nat vv.	<u> ز حم</u>	سم	dor L	unl 2A
XI.	Sample Result Verification			N				0	
XII.	Overall Assessment of Data			A					
XIII.	Field Duplicates			5W	D = 11 + 13	 }			120044
XIV.	Field Blanks			ろ	EB=14				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rins	o compound sate eld blank		TB =	Ouplica Trip bl Equipi		
1 1	I-AA	11	M-25 D		21			31	
	M-64	12	M-37		22			32	
	M-65		MD-4		23			33	
	M-66 ·	14	EB-1		24			34	
	M-79	15	M-135MS		25			35	
	M-69	16	M-135MSD		26			36	
	M-135	17	MB		27			37	
	M-131	18			28			38	
	M-57A	19			29			39	
	<b>M</b> -99	20			30			40	

Notes:

 $\epsilon$ 

LDC#: 21040104 SDG#: See Cover

#### **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page: \\_of \ Reviewer: A

2nd Reviewer:

METHOD: Metals (EPA Method 6010B)

QN NA **₹N NA** 

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(100)		
Compound	11	13	(≤ 30) RPD	
Chromium	13	13	0	

V:\FIELD DUPLICATES\FD\_inorganic\21040D4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 4, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264820

#### Sample Identification

M-92 M-12A M-97 EB-2 M-31A M-10 M-52 EB-2MS M-50 EB-2MSD

M-34

M-35

M-19

M-39

M-68

M-61

M-67

M-74

M-73

M-88

I-V

I-K

I-J

I-Z

1-1

#### Introduction

This data review covers 25 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 was identified as an equipment blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264820

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264820

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264820

No Sample Data Qualified in this SDG

SDG#	t:21040F4 #:_264820 atory:_MWH_Laboratorie	-	LIDATION		PLETEN evel 2A		WORKSHEET		Date: ¬ ( , ( )  Page: _ , of _ ,  Reviewer: _ A /  2nd Reviewer:
	IOD: Chromium (EPA S								<u>.</u>
	amples listed below were tion findings worksheets		wed for eac	ch of the fo	ollowing '	valida	tion areas. Validatio	n find	dings are noted in attached
	T				T		0	4	
	<u>Validation</u>	<u>ı Area</u>					Comm	ents	
1.	Technical holding times			A	Sampling	dates:	2 4 109		
11.	Calibration			N	<del> </del>				
111.	Blanks			_ A_					
IV.	ICP Interference Check Sa	ample (IC	CS) Analysis	N	1				
V	Matrix Spike Analysis			A_	14m	3 1	MSD		
VI.	Duplicate Sample Analysis	<u> </u>		2	1		<u> </u>		
VII.	Laboratory Control Sample	∌s (LCS)	,	Α	LUS			······························	
VIII.	Internal Standard (ICP-MS)			N .	1 No+	<u>- U</u>	+i lizud		
IX.	Furnace Atomic Absorption	n QC		N_	<u> </u>		L		
X	ICP Serial Dilution			N	Not	<u>نہ د</u>	niund for	Len	~l 2A
XI.	Sample Result Verification	1	1	N			<u> </u>		
XII.	Overall Assessment of Dat	ıta		A	<u> </u>				
XIII.	Field Duplicates	<del></del>		N				w	
XIV.	Field Blanks			ND	EB:	: 2_2			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	əle	R = Rin	lo compound nsate ield blank	Is detected	i	D = Duplicate TB = Trip blank EB = Equipment blan	k	
Validate	red Samples:	u.	water						
1	M-92	11	M-61		21	M-1	2A	31	
	M-97		M-67		22			32	
	M-31A		M-74		23			33	
	M-52	14	M-73		24		2MS	34	
	M-50	15	M-88		25		2MSD	35	
	M-34	16	I-V		26		18	36	
<b> </b>	141-0-4	<del>    -   -   -   -   -   -   -   -   -  </del>						07	

		<u> </u>	wate				
1	M-92	11	M-61	21	M-12A	31	
2	M-97	12	M-67	22	EB-2	32	
3	M-31A	13	M-74	23	<b>M</b> -10	33	
4	M-52	14	M-73	24	EB-2MS	34	
5	M-50	15	M-88	25	EB-2MSD	35	
6	M-34	16	I-V	26	MB	36	
7	M-35	17	I-K	27		37	
8	M-19	18	I-J	28		38	
9	M-39	19	I-Z	29		39	
10	M-68	20	1-1	30		40	

Notes:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264946

#### Sample Identification

M-87

M-70

M-71

M-72

M-22A

M-38

M-89

M-100

M-84

M-36

M-11

MD-2

#### Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

#### VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

Samples M-84 and MD-2 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	ion (mg/L)				A or P
Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	
Chromium	0.042	0.041	-	0.001 (≤0.020)	-	-

### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264946

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 264946

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264946

No Sample Data Qualified in this SDG

SDG # Labora	t: 21040G4 t: 264946 atory: MWH Laboratories	s	_	L	LETE evel 2		SS WORKSH	EET	Date: ¬ [ . [ . ] . Page: of Reviewer: _ <u> </u>
The sa	·	e revie			ollowing	g vali	idation areas. Va	alidation find	dings are noted in attached
	Validation	Area						Comments	
l.	Technical holding times				Samplin	ng dat	es: 2   5	09	
II.	Calibration			N	ļ				
111.	Blanks			A					
IV.	ICP Interference Check Sar	mple (I	CS) Analysis	N					
V.	Matrix Spike Analysis			Δ	} f.	<u>~~</u>	264820	1 265	481
VI.	Duplicate Sample Analysis			7	<u> </u>				
VII.	Laboratory Control Samples	s (LCS)		A	Lc	s			
VIII.	Internal Standard (ICP-MS)	1		N	No	+	ut: 1:2 ed		
IX.	Furnace Atomic Absorption	QC		2	L		<u> </u>		
X.	ICP Serial Dilution			N	<u>                                    </u>	+	veriund	for Le	ul 2A
XI.	Sample Result Verification			N				U	
XII.	Overall Assessment of Data	a		Δ					
XIII.	Field Duplicates			5W	D:	9	+ 12		
XIV.	Field Blanks			7					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin: FB = Fie	o compound sate eld blank	ls detecte	∍d	D = Duplicate TB = Trip blaı EB = Equipm	nk	
	Δυ.				T,	T			I
	M-87	11	M-11			21		31	
	M-70	12	MD-2			22		32	
	M-71	13	MB			23		33	
	M-72	14				24		34 35	
	M-22A	15				25		36	
	M-38	16						37	
	M-89 M-100	17				27		38	
		1 7 8	1		1./	/× :		1.11.)	

Notes:	

20

40

M-36

LDC#: <u>21040G4</u> SDG#: <u>See Cover</u>

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: \\_of \\_
Reviewer: \\_d\_
2nd Reviewer: \\_

METHOD: Metals (EPA Method 6010B)

(YN NA

Were field duplicate pairs identified in this SDG?

NN NA Were target analytes detected in the field duplicate pairs?

0,020

	Concentra	1	(د، ج	
Compound	9	12	( <u>€≥</u> 0) RPD	
Chromium	0.042	0.041	2. 0.001	

V:\FIELD DUPLICATES\FD\_inorganic\21040G4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264958

Sample Identification

M-17A

M-76

M-75

M-115

M-14A

#### Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

#### VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

DC #: 21040H4 VALIDATION DG #: 264958 Laboratory: MWH Laboratories  METHOD: Chromium (EPA SW 846 Method 60				L	PLETE Level 2		WORKSHI	EET	Page: 1 of 1 Reviewer: Ad 2nd Reviewer:		
Γhe s	amples listed below were tion findings worksheets.				ollowing	validat	ion areas. Val	idation findi	ngs are noted in attached		
	Validation	Area				omments					
l.	Technical holding times			A	Samplin	g dates:	2/6/	09			
II.	Calibration			N							
111.	Blanks			A			<u> </u>				
IV.	ICP Interference Check Sam	ple (ICS	) Analysis	N							
V.	Matrix Spike Analysis			A_	13 £	rm	265481				
VI.	Duplicate Sample Analysis			<i>N</i>	$\sqcup$						
VII.	Laboratory Control Samples	(LCS)		A	Lc	\$					
VIII.	Internal Standard (ICP-MS)			N	ه دم ا	+ U	+: lited				
IX.	Furnace Atomic Absorption	QC		7	L		L				
Χ.	ICP Serial Dilution			N	Not	· rea	/immed	for her	L 2A		
XI.	Sample Result Verification			N				<u> </u>			
XII.	Overall Assessment of Data			<u> </u>	ļ						
XIII.	Field Duplicates			N							
XIV.	Field Blanks			<u>~~</u>							
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	ds detecte	d	D = Duplicate TB = Trip blant EB = Equipme				
	ted Samples:	ىي ۸	<u>-                                    </u>								
1	M-17A	11			2.			31			
2	M-76	12			22	2		32			
3	M-75	13			23	3		33			
4	M-115	14			24	1		34			
5	M-14A	15			25	5		35			
6	MB	16			20	3		36			
7		17			2.	7		37			
8		18			28	3		38			
9		19			29	9		39			
10		20			30	0		40			

#### Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 9 through February 12, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

PC-18

Sample Delivery Group (SDG): 265481

#### Sample Identification

MW-K4 ARP-1 ARP-4A ARP-5A

PC-55 L-635 L-637 ARP-6B MW-K4MS PC-53 MW-K4MSD PC-103 PC-98RMS MW-5K PC-98RMSD

M-87 PC-98R PC-86 PC-90 PC-56

PC-58 PC-59

PC-60

PC-62

PC-68

PC-91

PC-97

#### Introduction

This data review covers 28 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

SDG # _abora <b>METH</b> ( The sa	21040l4 : 265481 tory: MWH Laboratories  OD: Chromium (EPA SV mples listed below were on findings worksheets.	V 846	- 3 Method 60	10B)	evel 2A			Date:		
	Validation	Area					Comments			
I.	Technical holding times			Д	Sampling	dates: 2   9	- 2/12	09		
11.	Calibration			N						
III.	Blanks			А						
IV.	ICP Interference Check San	nple (IC	CS) Analysis	N						
V.	Matrix Spike Analysis				3 M	5 (M5D				
VI.	Duplicate Sample Analysis			2	)					
VII.	Laboratory Control Samples	(LCS)	1	^_	LC 5					
VIII.	Internal Standard (ICP-MS)			N	Not (1tilized					
IX.	Furnace Atomic Absorption	QC		N	L	L				
X.	ICP Serial Dilution			N	Not	veriend	for Level	2A		
XI.	Sample Result Verification			N						
XII.	Overall Assessment of Data	l		Α						
XIII.	Field Duplicates			2						
XIV.	Field Blanks			7			À.			
Note: /alidate	A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:	· ~-1	R = Rins FB = Fie	o compound sate eld blank	ds detected	TB = Trip t				
1	MW-K4	11	PC-86		21	PC-18	31			
	ARP-1	12	PC-90	***	22	PC-55	32			
	ARP-4A	13	PC-56		23	L-635	33			
	ARP-5A	14	PC-58		24	L-637	34			
·	ARP-6B	15	PC-59		25	MW-K4MS	35			
	PC-53	16	PC-60		26	MW-K4MSD	36			
	PC-103	17	PC-62		27	PC-98RMS	37			
	MW-5K	18	PC-68		28	PC-98RMSD	38			
9	M-87	19	PC-91		29	MB	39			
	PC-98R	20	PC-97		30		40			

Notes:\_

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 17, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 265658

Sample Identification

M-23

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 265658

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 265658

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 265658

No Sample Data Qualified in this SDG

LDC #:	21040J4	VAL	<b>IDATIO</b>	N COMF	PLETENE	HEET	Date: ٦١٠ اي	
	: <u>265658</u> tory: <u>MWH Laboratories</u>							Page:of Reviewer:
METH	OD: Chromium (EPA S\	N 846	Method 60	)10B)				2nd Reviewer:
	·			·	allovina va	lidation arosa \	/alidation finding	an are noted in attached
	inples listed below were on findings worksheets.		wed for eac	on or the i	ollowing va	ilidation aleas. V	alidation illidii	ngs are noted in attached
					1			1
	Validation	Area			1		Comments	
<u>I.</u>	Technical holding times			A	Sampling da	ates: 2   17	109	
11.	Calibration		1440	N				
III.	Blanks			Δ				
IV.	ICP Interference Check San	nple (IC	S) Analysis	N	ļ			
V.	Matrix Spike Analysis			N	1 CU	A Spec	i find	
VI.	Duplicate Sample Analysis			~				
VII.	Laboratory Control Samples	(LCS)		Δ	LCS			
VIII.	Internal Standard (ICP-MS)			N	Not	Utiliza	4	
IX.	Furnace Atomic Absorption	QC		N	l	L		
Х.	ICP Serial Dilution			N	100 t	ver: med	1- Len	l 2A
XI.	Sample Result Verification			N			U	
XII.	Overall Assessment of Data	1		Д				
XIII.	Field Duplicates			N				
XIV.	Field Blanks			N				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	ls detected	D = Duplicat TB = Trip bla EB = Equipr	ank	
√alidate	d Samples:	·	v+					
1 N	<b>Л-23</b>	11			21		31	
2	MB	12			22		32	
3		13			23		33	
4		14			24		34	
5		15	·		25		35	
6		16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39	
10		20			30		40	
Notes:								

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 4, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A & 4

MD-1

MD-3

PC-126MS

M-23MS

M-23MSD

PC-126MSD

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270339

#### Sample Identification

PC-123\*\*

PC-124\*\*

PC-125\*\*

PC-126\*\*

PC-127\*\*

0-127

PC-128\*\*

PC-129\*\*

PC-130\*\*

PC-131\*\*

PC-132\*\*

M-96\*\*

PC-54\*\*

PC-37\*\*

PC-71\*\*

PC-72\*\*

PC-73\*\*

M-23\*\*

M-95

M-44

FB-1

<sup>\*\*</sup>Indicates sample underwent Stage 4 review

#### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a Stage 4 review. A Stage 2A review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Stage 2A criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### 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.

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

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

Sample FB-1 was identified as a field blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### 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 this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

#### 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 M-95 and MD-1 and samples PC-54\*\* and MD-3 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)		-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Analyte	M-95	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	1.1	1.0	10 (≤30)	-	-	-

	Concentra	tion (mg/L)					
Analyte	PC-54**	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	1.8	1.8	0 (≤30)	•	-	•	

#### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270339

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270339

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270339

No Sample Data Qualified in this SDG

SDG	#: <u>21040O4</u> #: <u>270339</u> ratory: <u>MWH Laboratorie</u> :		ALIDATIO		PLETE evel 2/		ESS WORKSH 4	HEET		Date: "] > 1   Page: 1 of 1   Reviewer: 4   Page: 4   Pa
MET	HOD: Chromium (EPA S	W 84	6 Method 60	010B)						Zilu Neviewei.
The s /alida	samples listed below were ation findings worksheets	e revi	ewed for ea	ch of the fo	ollowing	g v	alidation areas. V	alidation fi	inc	dings are noted in attached
	Validation	Area						Comment	ts	
1.	Technical holding times			A	Samplin	ng c	lates: 5/4/09			
11.	Calibration			A			ed for Level 2A valida	ition.		
111.	Blanks			A						
IV.	ICP Interference Check Sar	nple (l	CS) Analysis	MA	10,7		pureual fr	- len	<u> </u>	<b>Σ</b> Α
V.	Matrix Spike Analysis			À	1	M	1/450			* /
VI.	Duplicate Sample Analysis			'N	3. 7,4					
VII.	Laboratory Control Samples	(LCS	)	A	L'	cs	lusp			
VIII.	Internal Standard (ICP-MS)			N	<u> </u>	1/4	+ Mthyl			
IX.	Furnace Atomic Absorption	QC		N			<u> </u>			
X.	ICP Serial Dilution	<u>.</u>		N	Not rev	iew	ed for Level 2A valida	tion. V	+	performed
XI.	Sample Result Verification			A	Not rev	iew	ed for Level 2A valida	tion.		
XII.	Overall Assessment of Data	1		<u> </u>	<u> </u>				•	
XIII.	Field Duplicates			3~			, z1), (1z,	<b>√</b> ✓)		
XIV.	Field Blanks		·	M	T	FB	=20	`	·····	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins FB = Fig	eld blank	s detecte	ed	D = Duplicate TB = Trip blar EB = Equipm	nk		
/alidat	ted Samples: ** Indicates sam	ole un	derwent Level I	V validation						
1	PC-123**	11	M-96**		2	/ 1	MD-1	31		МЪ
2	PC-124**	12	PC-54**		22	Ţ	MD-3	32	П	
3	PC-125**	13	PC-37**		23	3	PC-126MS	33		
4	PC-126**	14	PC-71**		24	4	PC-126MSD	34		
5	PC-127**	15	PC-72**		25	5	M-23MS	35		
6	PC-128**	16	PC-73**		26	3	M-23MSD	36	$\perp$	
7	PC-129**	17	M-23**		27	7		37		

9	PC-131**	19	M-44	29	39	
10	PC-132**	20	FB-1	30	40	
Notes	S:					
						<del></del>

LDC #: 2104004 SDG #: ~10338

#### **VALIDATION FINDINGS CHECKLIST**

Page: \_\_of\_\_\_ Reviewer: \_\_\_\_\_ 2nd Reviewer: \_\_\_\_\_

Method: Metals (EPA SW 846 Method 6010B/7000/6020)

Method: Metals (EPA SW 846 Method 6010B/7000/6020)				
Validation Area	Yes	No	NA	Findings/Comments
All technical holding times were met.	1			
Cooler temperature criteria was met.	/			
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	<u> </u>		1	
Were %RSD of isotopes in the tuning solution ≤5%?				CANADA CONTRACTOR OF CHILD STATE AND CONTRACTOR OF CHILD AND CONTRACTOR OF CONTRACTOR OF CONTRACTOR OF
Were all instruments calibrated daily, each set-up time?	1			
Were the proper number of standards used?	1			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	/			
Were all initial calibration correlation coefficients ≥ 0.995?	/			
Was a method blank associated with every sample in this SDG?	1			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
War in the same of				
Were ICP interference check samples performed daily?	/			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	/			
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<u> </u>			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	1			
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were $\leq$ 5X the RL, including when only one of the duplicate sample values were $\leq$ 5X the RL.	/			
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?				

#### **VALIDATION FINDINGS CHECKLIST**

ſ	l		Γ	
Validation Area	Yes	No	NA HEAR	Findings/Comments
If MSA was performed, was the correlation coefficients > 0.995?			/	
Do all applicable analysies have duplicate injections? (Level IV only)	<b> </b>		_	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			1	
Were analytical spike recoveries within the 85-115% QC limits?				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		1		
Were all percent differences (%Ds) < 10%?			/	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		Warren -		
Sterran Second a recommendation of the base of the second				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			/	
If the %Rs were outside the criteria, was a reanalysis performed?				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?				
	100			
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<u>&gt;</u>			
Overall assessment of data was found to be acceptable.			CIZATIBITAL	
Field duplicate pairs were identified in this SDG.	1			
Target analytes were detected in the field duplicates.	/			
	r (			
Field blanks were identified in this SDG.	V			
Target analytes were detected in the field blanks.				

LDC#:	2104004
SDG#	See Cover

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:	_of	
Reviewer:_	<u> </u>	
2nd Reviewer:	9	_

METHOD: Metals (EPA Method 6010B)

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	Concentration (mg/L)		
Compound	18	21	(≤ 30) RPD	(≤ 0.010) Difference
Chromium	1.1	1.0	10	

	Concentra	tion (mg/L)		
Compound	12	22	(≤ 30) RPD	(≤ 0.010) Difference
Chromium	1.8	1.8	0	

V:\FIELD DUPLICATES\FD\_inorganic\21040O4.wpd

V:\FIELD DUPLICATES\FD\_inorganic\21040O4.wpd

LDC # Noto Out SDG #: 2/1 233 S

# Initial and Continuing Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

Page: of Reviewer:\_ 2nd Reviewer:\_\_

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found × 100 True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution True = concentration (in ug/L) of each analyte in the ICV or CCV source

					Receionisted	Reported	
Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	%R	%R	Acceptable (Y/N)
Zw.	ICP (Initial calibration)	3	1000	٥)	٥٠)	00)	A
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
مح	ICP (Continuing calibration)	Z	11-5	500	7.1	—ر <i>ه</i> )	λ
	GFAA (Continuing calibration)				·		
	CVAA (Continuing calibration)						
	ICP/MS (initial calibration)	o .					
	ICP/MS (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #: 2108

# **VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet**

Page: \_\_\_of\_ Reviewer: 2nd Reviewer:\_

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found × 100 True

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).

True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = IS-DI × 100 (S+D)/2

Where, S = Original sample concentration
D = Dupilicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = II-SDRI x 100

Where, I = Initial Sample Result (mg/L) SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	%R/RPD/%D	%R/RPD/%D	Acceptable (Y/N)
LUSIM	ICP interference check	S	0.155	مير٠٥	\( \frac{\lambda}{\circ} \)	انع	Y
601	Laboratory control sample		250	00-	26	45	
43	Matrix spike		afo (ssrss)	00~)	96	96	
tala	Duplicate	*	6	53	7	MR	7
2	ICP sertal dilution						

Comments: Refer to appropriate worksheet for listic qualifications and associated samples when reported results do not agree within 10,0% of the recalculated results.

LDC #:	2/0	4004
SDG #:_	γ*	10335

#### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:	
Reviewer:	My ,
2nd reviewer:	1/
	T

METHO	DD: Tra	ce Metals (EPA SW 846 M	ethod 6010/7000)	
Please Y) N I X N I		Have results been report	ed and calculated correctly? brated range of the instruments a	ble questions are identified as "N/A".  Ind within the linear range of the ICP?
	d analy g equa	rte results for tion:	1.11	were recalculated and verified using the
Concentr	ation =	(RD)(FV)(Dil) (In. Vol.)(%S)	Recalculation:	
RD FV In. Vol. Dil %S	# # #	Raw data concentration Final volume (ml) Initial volume (ml) or weight (G) Dilution factor Decimal percent solids	#11 W = 01	118 mg/ x 2 0.986 mg/2

° Sample ID	Analyte	Reported Concentration ( W. )	Calculated Concentration	Acceptable (Y/N)
	cr	1.7	1,7	4
·		,	/	,
1)	Cr	0.96	0.96	
				,
·				,
			<u>:</u>	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270369

Sample Identification

M-5A

M-5AMS

M-5AMSD

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270369

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270369

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270369

No Sample Data Qualified in this SDG

SDG i Labor	#: 21040P4 #: 270369 atory: MWH Laboratorie	<u>s</u>	L	PLETENESS WO Level 2A	PRKSHEET	Date: ユル(ಀಀ Page: ೣof ೣ Reviewer: Δ 2nd Reviewer: _ પ
The s	<b>IOD:</b> Chromium (EPA Samples listed below wer tion findings worksheets	e reviewed for		ollowing validation a	reas. Validation findir	ngs are noted in attached
	Validation	Area		ļ	Comments	
l.	Technical holding times		A_	Sampling dates: S	5 109	
II.	Calibration		N			
III.	Blanks		A			
IV.	ICP Interference Check Sa	mple (ICS) Analys	is N			
V.	Matrix Spike Analysis			3 MSIM	s n	
VI.	Duplicate Sample Analysis		N			
VII.	Laboratory Control Sample	s (LCS)	A	LCS		
VIII.	Internal Standard (ICP-MS		N	No+ W+:1	read	
IX.	Furnace Atomic Absorption	QC	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	L	l	
Χ.	ICP Serial Dilution		N	Not ver: w.	ed for Lun	{ 2A
XI.	Sample Result Verification		N		0	
XII.	Overall Assessment of Dat	a	A			·
XIII.	Field Duplicates		7			
XIV.	Field Blanks		7			
Note:	A = Acceptable N = Not provided/applicabl SW = See worksheet	e R=	= No compound Rinsate = Field blank	TB =	Duplicate = Trip blank = Equipment blank	
Validat	ed Samples:	don 1				
1	M-5A	11		21	31	
2	M-5AMS	12		22	32	
3	M-5AMSD	13		23	33	
4	MB	14		24	34	
5		15		25	35	
6		16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270376

#### Sample Identification

1-0

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

#### Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270376

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270376

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270376

No Sample Data Qualified in this SDG

SDG # Labora	_DC #: _21040Q4 VALIDATIO  DG #: _270376 _aboratory: MWH Laboratories  METHOD: Chromium (EPA SW 846 Method 6			L	PLETENES evel 2A	IEET	Date: ¬ ( ,   o o  Page: _ , of _ ,  Reviewer: △ △  2nd Reviewer: _ ✓	
The sa		revie			ollowing valida	ation areas. Va	alidation findir	ngs are noted in attached
	Validation	<u>Area</u>					Comments	
1.	Technical holding times			A	Sampling dates	: 5 S	٥٩	
11.	Calibration			N		·		
III.	Blanks			A				
IV.	ICP Interference Check San	nple (I	CS) Analysis	N				
V.	Matrix Spike Analysis			2	3 Cl:~	+ Sperif	با	
VI.	Duplicate Sample Analysis			N		`		
VII.	Laboratory Control Samples	(LCS	)	A	LCS			
VIII.	Internal Standard (ICP-MS)			N	100 + C	11: liza	占	
IX.	Furnace Atomic Absorption	QC		7	L	l		
X.	ICP Serial Dilution			N	Not v	er; wid	1- Lan	( 2 A
XI.	Sample Result Verification			N			<u> </u>	
XII.	Overall Assessment of Data			A				
XIII.	Field Duplicates			N				
XIV.	Field Blanks			7				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip bla EB = Equipm	nk	
Validate	ed Samples:	<u>ر</u>	w~+-					
1	I-O	11	I-M		21		31	
	I-P	12	I-D		22		32	
3	I-H	13	I-C		23		33	
4	I-U	14	I-S		24		34	
5	I-T	15	I-L		25		35	
	I-G	16	I-R		26		36	
	I-Q	17	I-B		27		37	
	I-F	18	I-AR		28		38	
	I-N	19	MB		29		39	
	I-E	20			30		40	
Notes								

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270390

# Sample Identification

I-AA

M-131

M-57A

M-79

M-69

M-135

M-25

M-99

M-37

MD-4

EB-1

#### Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-1 was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

### VIII. Laboratory Control Samples (LCS)

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

### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

Samples M-57A and MD-4 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	tion (mg/L)				A or P	
Analyte	M-57A	MD-4	RPD (Limits)	Difference (Limits)	Flag		
Chromium	0.075	0.076	-	0.001 (≤0.020)	-	-	

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270390

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270390

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270390

No Sample Data Qualified in this SDG

				\$					
SDG # Labora <b>METH</b>	#:21040R4 #:_270390 atory:_MWH_Laboratories HOD: Chromium (EPA SW	V 846	- 3 Method 60	)10B)	PLETENESS W evel 2A		Date: ¬   \ \ Page: \_\ of \\ Reviewer: \_\ 2nd Reviewer: \_\ findings are noted in attached		
The sa validat	amples listed below were tion findings worksheets.	revie	wed for each	th of the ro	ollowing validation	areas. Validation	findings are noted in attached		
	Validation A	Area				Commen	nts		
l.	Technical holding times			A	Sampling dates: S	15/09			
It.	Calibration			N					
111.	Blanks			A					
IV.	ICP Interference Check Sam	ıple (IC	CS) Analysis	N					
V.	Matrix Spike Analysis			Δ_	} f 27	+0369			
VI.	Duplicate Sample Analysis			2					
VII.	Laboratory Control Samples	(LCS)	)		LLS				
VIII.	Internal Standard (ICP-MS)			N	Not us	+: 1:2-1			
IX.	Furnace Atomic Absorption (	QC		N	<u> </u>				
Χ.	ICP Serial Dilution			N	Not reviewed for Loud 2A				
XI.	Sample Result Verification			N					
XII.	Overall Assessment of Data	I							
XIII.	Field Duplicates			<u>5</u> ω	1):3+10	)			
XIV.	Field Blanks			110	EB: 11				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	;	R = Rin	lo compound sate ield blank	Т	) = Duplicate B = Trip blank B = Equipment blank			
Validat	ted Samples:	w							
1	I-AA	11	EB-1		21	3	1		
	M-131	12	MB		22	3	32		
3	M-57A	13			23	3	33		
4	M-79	14			24	3	34		
5	M-69	15			25	3	35		
	(	40			26	2	86		

M-135 M-25 M-99 M-37 MD-4 **5** 

Notes:	

LDC#: 21040R4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: vof v Reviewer: A 

METHOD: Metals (EPA Method 6010B)

YN NA YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	Concentration (mg/L)				
Compound	3	10	(<38) (lints)			
Chromium	0.075	0.076	0,00 (50,000)			

V:\FIELD DUPLICATES\FD\_inorganic\21040R4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270439

# Sample Identification

M-92

M-97

M-33

M-31A

M-52

M-50

M-21

M-34

M-35

M-19

141-10

M-39

M-68

M-74

M-73

M-88

M-11

M-12A

M-13

MD-5

EB-2

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

### VI. Matrix Spike Analysis

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

### VII. Duplicate Sample Analysis

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

### VIII. Laboratory Control Samples (LCS)

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

### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-34 and MD-5 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentrat	tion (mg/L)					
Analyte	M-34	MD-5	RPD (Limits)				
Chromium	14	15	7 (≤30)	-	-	-	

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270439

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270439

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270439

No Sample Data Qualified in this SDG

SDG _abor <b>METI</b> The s	#:21040S4 #:_270439 atory: MWH Laboratories HOD: Chromium (EPA SV amples listed below were tion findings worksheets.	v 846	- 6 Method 60	)10B)	.eve	I 2A	ESS WORKS		finc	Date: 2 1 1 5 Page: 1 of 1 Reviewer: 2nd Reviewer: 1
- I	Validation	Aroa						Comme	nte	1 th 10 th 1
I.	Technical holding times	AICA		Α	Sami	oling d	ates: 5   C	1,29	111.3	
11.	Calibration			N		- · · · · · · · ·				
III.	Blanks			Δ						
IV.	ICP Interference Check San	nple (I	CS) Analysis	N						
V.	Matrix Spike Analysis			2	}	C1.	. 4 Spc	-: (: A		
VI.	Duplicate Sample Analysis						1			
VII.	Laboratory Control Samples	Δ	<u>_</u>	دح						
VIII.	Internal Standard (ICP-MS)	N	<u>~</u>	٠+	Utiliz.	ud				
IX.	Furnace Atomic Absorption	7		L	l l					
Χ.	ICP Serial Dilution			N	u	o +	revisioned	1- 1	_w	-l 2A
XI.	Sample Result Verification			N	U					
XII.	Overall Assessment of Data			Δ_						
XIII.	Field Duplicates			SW	D	: 8	+ 19			
XIV.	Field Blanks			20	EB: 20					
Note: √alida	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound sate eld blank	s dete	cted	D = Duplic TB = Trip EB = Equi			
1	M-92	11	M-39			21	MB	3	31	
2	M-97	12	M-68			22			32	
3	M-33	13	M-74			23			33	
4	M-31A	14	M-73			24			34	
5	M-52	15	M-88			25			35	
6	M-50	16	M-11			26			36	
7	M-21	17	M-12A			27		3	37	
8	M-34 <sup>5</sup>	18	M-13			28			38	
9	M-35	19	MD-5			29			39	

Notes:	 	 	
-			

20

EB-2

30

M-19

LDC#: 21040S4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page: \ of \ Reviewer: 🔥 2nd Reviewer:

METHOD: Metals (EPA Method 6010B)

ON NA (<u>Y)N NA</u>

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)		
Compound	8	19	(≤ 30) RPD	
Chromium	14	15	7	

V:\FIELD DUPLICATES\FD\_inorganic\21040S4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270442

Sample Identification

I-K

I-J I-I

I-Z

I-V

#### Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 (from SDG 270439) was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270442

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270442

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270442

No Sample Data Qualified in this SDG

	#: <u>270442</u>			L	_evel 2	2A				Page: \_of_\	
Labor	atory: <u>MWH Laboratories</u>	<u> </u>								Reviewer: <u>&amp;</u> Reviewer:	
METH	HOD: Chromium (EPA S)	N 846 Met	hod 60	10B)							
	amples listed below were		for eac	h of the f	ollowing	g val	idation areas. V	alidation fir	ndings are	noted in attached	
/alida	tion findings worksheets.										
	Validation	Δrea						Comment			
I.	Technical holding times			A	Samplii	na da		১৭			
11.	Calibration			N N	Campin	ig du		<u> </u>			
111.	Blanks										
IV.	ICP Interference Check San	nple (ICS) An	alvsis	N							
V.	Matrix Spike Analysis	<u> </u>		A	7	E ~~	- 270339				
VI.	Duplicate Sample Analysis			$\sim$		· · · · · · · · · · · · · · · · · · ·					
VII.	Laboratory Control Samples	(LCS)		Δ.	Li	<u> </u>					
VIII.	Internal Standard (ICP-MS)			N	1		utili End				
IX.	Furnace Atomic Absorption	QC		7	l		utilized V				
X.	ICP Serial Dilution		N	1	Not reviewed for 2ml 2A						
XI.	Sample Result Verification		N	Ü							
XII.	Overall Assessment of Data		Α						:		
XIII.	Field Duplicates			2							
XIV.	Field Blanks			20	EB: EB-2 (for 270439)						
Note:	A = Acceptable N = Not provided/applicable	1	R = Rins		ls detecte	ed	D = Duplicate TB = Trip bla	nk			
	SW = See worksheet		FB = Fie	ld blank			EB = Equipm	ent blank			
/alidat	ed Samples:	wel									
1	I-K	11	·		2	1		31			
2	I-J	12	·		2	2		32			
3	J-I	13			2	3		33			
4	I-Z	14			2	4		34			
5	I-V	15			2	5		35			
6	MB	16	·		2	6		36			
7		17			2	7		37			
8		18			2	8		38	-		
9		19			2	9		39			
10		20			3	0		40			
Votes											
10103	•										

LDC #: 21040T4 VALIDATION COMPLETENESS WORKSHEET

Date: 7 2 39

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 8, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270578

Sample Identification

PC-93

PC-2

PC-104

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

SDG # _abora	DC #: 21040W4 VALIDATION DG #: 270578 Aboratory: MWH Laboratories  WETHOD: Chromium (EPA SW 846 Method 6				LETENE evel 2A	IEET	Date: → ( )   a Page: _ of _ \ Reviewer: _ A \ 2nd Reviewer: _ \				
Γhe sa	•	reviewed			ollowing va	alidation areas. Va	alidation findi	ngs are noted in attached			
	Validation	Area			Comments						
I.	Technical holding times			Α	Sampling dates: 5 8 09						
II.	Calibration			N							
111.	Blanks			Δ_							
IV.	ICP Interference Check Sam	nple (ICS) An	alysis	N							
V.	Matrix Spike Analysis			7	3 01	nt Span	. f : d				
VI.	Duplicate Sample Analysis					\					
VII.	Laboratory Control Samples	(LCS)		A	Les						
VIII.	Internal Standard (ICP-MS)		N	Not utilised							
IX.	Furnace Atomic Absorption	QC		N	l	l					
Χ.	ICP Serial Dilution			N	Not	veniend for	Lul	<u> </u>			
XI.	Sample Result Verification			N		U					
XII.	Overall Assessment of Data			<u> </u>							
XIII.	Field Duplicates			7							
XIV.	Field Blanks			М							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	ND = No R = Rinsa FB = Fiel	ate	s detected	D = Duplicate TB = Trip bla EB = Equipm	nk				
	ed Samples:	wet									
1 2	PC-93	11			21		31				
2	PC-2	12			22		32				
	PC-104	13			23		33				
4	MB	14			24		34				
5		15			25		35				
6		16			26		36				
7		17			27		37				
8		18			28		38				
9		19			29		39				
10	_	20			30		40				

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 8, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270579

Sample Identification

M-17A

M-2A

M-76

M-75

M-115

M-14A

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

### VII. Duplicate Sample Analysis

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

### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270579

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270579

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270579

No Sample Data Qualified in this SDG

SDG _abor <b>METH</b> The s	#: 21040X4  #: 270579  ratory: MWH Laboratorie  HOD: Chromium (EPA Samples listed below were attention findings worksheet)	SW 846 Method 6	<b>l</b> 010B)	_evel 2A				n findi	Page: 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	Validation	n Area					Comme	ents	
I.	Technical holding times		A	Sampling date	es: 5	8	29		
II.	Calibration		N						
III.	Blanks		Δ						
IV.	ICP Interference Check Sa	ample (ICS) Analysis	N						
V.	Matrix Spike Analysis		2	? Cri~	+ 5;	·~: {	: -d		
VI.	Duplicate Sample Analysis	6	N	)					
VII.	Laboratory Control Sample		٨	LLS					
VIII.	Internal Standard (ICP-MS		N	Not (	 ۱۱:۱:	د_اط			
IX.	Furnace Atomic Absorptio		7	l					
X.	ICP Serial Dilution		N	Not	·w:	له الدر	. 1.	Lu	L 2 A
XI.	Sample Result Verification	1	N	0					
XII.	Overall Assessment of Da		A						
XIII.	Field Duplicates		7						
XIV.			N			·			
Note: √alidat	A = Acceptable N = Not provided/applicab SW = See worksheet ted Samples:	le R = Rir	lo compound nsate ield blank	ls detected	TB =	Duplica Trip bla Equipr			
1	M-17A	11		21				31	
2	M-2A	12		22				32	
3	M-76	13		23				33	
4	M-75	14		24				34	
5	M-115	15		25				35	
6	M-14A	16		26				36	
7	MB	17		27				37	
8	_	18		28				38	
9		19		29				39	
10		20		30				40	

Notes:\_\_\_

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 11, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270639

Sample Identification

PC-79

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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 this SDG.

# III. Calibration

Calibration data were not reviewed for Stage 2A.

# IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

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

# VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

# XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

# XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

	: 270639			_evel 2A		Page:of Reviewer:م_	
abora	atory: <u>MWH Laboratories</u>						2nd Reviewer:
ETH	OD: Chromium (EPA SV	V 846 Method	6010B)				~ ~~
he sa	amples listed below were	reviewed for e	each of the f	ollowing valid	ation areas. Val	idation finding	gs are noted in attache
	ion findings worksheets.			•			-
	T						
******	<u>Validation</u>	<u>Area</u>			1 1	omments	
<u>l.</u>	Technical holding times			Sampling dates	s: 5   11   ,	29	
II.	Calibration		N				
III.	Blanks		A				
IV.	ICP Interference Check Sam	ple (ICS) Analysi	s N	1			
V.	Matrix Spike Analysis		<u>₩</u>	1 Cliv	A Specific	<u>d</u>	
VI.	Duplicate Sample Analysis		12				
VII.	Laboratory Control Samples	(LCS)	A	LCS			
VIII.	Internal Standard (ICP-MS)		N	Not (	1tilita		
IX.	Furnace Atomic Absorption	QC	<u> </u>		l		
Χ.	ICP Serial Dilution		N	Not	reviewed	for Low	2 A
XI.	Sample Result Verification		N			0	
XII.	Overall Assessment of Data		A				
XIII.	Field Duplicates		2				
XIV.	Field Blanks		7				
ote:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = F	No compound Rinsate Field blank	ds detected	D = Duplicate TB = Trip blank EB = Equipme		
alidate	ed Samples:						
Т	<u> </u>	we t					
	PC-79	11		21		31	
_	MB	12		22		32	
_		13		23		33	
		14		24		34	
		15		25		35	
		16	·	26		36	
		17		27		37	
		18		28		38	
		19		29		39	
0		20		30		40	

Date: 7/2/09

LDC #: 21040Y4 VALIDATION COMPLETENESS WORKSHEET

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 12, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270708

Sample Identification

PC-24

PC-50

# Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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 this SDG.

## III. Calibration

Calibration data were not reviewed for Stage 2A.

# IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

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

# VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

# XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

# XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270708

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270708

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270708

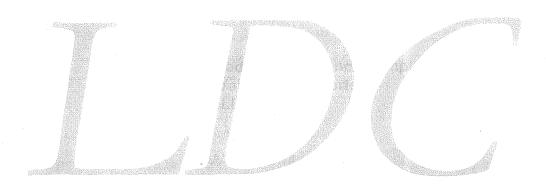
No Sample Data Qualified in this SDG

SDG#	:21040Z4 :: 270708 atory:_MWH Laboratories			PLETENES Level 2A	Page: 1 of 1 Reviewer: A1 2nd Reviewer: L	
METH	OD: Chromium (EPA SV	V 846 Metho	od 6010B)			<u></u>
	amples listed below were ion findings worksheets.	reviewed fo	r each of the f	following valida	ation areas. Validation fin	dings are noted in attached
	Validation	Area			Comments	
I.	Technical holding times		A_	Sampling dates	5/12/09	
11.	Calibration		N		Y	
III.	Blanks		A_			
IV.	ICP Interference Check Sam	ple (ICS) Anal	ysis N			
V.	Matrix Spike Analysis		7	3 Clina	+ Iquified	
VI.	Duplicate Sample Analysis		2			
VII.	Laboratory Control Samples	(LCS)	A	LLS		
VIII.	Internal Standard (ICP-MS)		N	Not C	W:1:2-d	
IX.	Furnace Atomic Absorption	QC	<u> </u>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	l	
X	ICP Serial Dilution		N	Not v.	viewed for La	ul 2A
XI.	Sample Result Verification		N		U	
XII.	Overall Assessment of Data					
XIII.	Field Duplicates		7	<b>_</b>		
XIV.	Field Blanks				**************************************	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R	D = No compound = Rinsate 3 = Field blank	ds detected		
Validate	ed Samples:	ــــــــــــــــــــــــــــــــــــــ				
1	PC-24	11		21	31	
2	PC-50	12		22	32	
3	MB	13		23	33	
4		14		24	34	
5	V	15		25	35	
6		16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	
Notes	,					

Date: 7/2/09

# 2009 Annual Remedial Performance Sampling Data Validation Reports LDC# 21040

Wet Chemistry



# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

January 12 through January 15, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 263577

# Sample Identification

M-87 PC-91 PC-98R PC-97 PC-86 PC-17 PC-90 PC-18 PC-56 PC-55 PC-58 L-635 PC-59 L-637 PC-60 M-87DUP

PC-62 PC-68

PC-122

MW-K4 ARP-1

ARP-4A

ARP-5A

ARP-6B

ARP-7

PC-53

PC-103

MW-K5

# Introduction

This data review covers 28 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 263577

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 263577

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 263577

No Sample Data Qualified in this SDG

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attach validation findings worksheets.    Validation Area	SDG Labo	#:21040A6 #:_263577 rratory:_MWH_Laboratories HOD: (Analyte)Perchlo	s		S	Leve STAG 7	) 2A 논			Date: ¬ [ ,   ,   ,   ,   ,   ,   ,   ,   ,   ,
I.   Technical holding times	The s	samples listed below were ation findings worksheets	e revi	iewed for ea	ch of the f	follow	/ing v	alidation areas.	Validation fir	ndings are noted in attache
III.		Validation	Area	a					Comment	s
III.	_1.	Technical holding times			A	Sam	oling (	dates: \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7 1 15	109
III.   Blanks	lla.						<u> </u>			10:
III.   Blanks						†				
V   Matrix Spike/Matrix Spike Duplicates						†				
V         Duplicates         A         CCS D           VI.         Laboratory control samples         A         CCS D           VII.         Sample result verification         N           VIII.         Overall assessment of data         A           IX.         Field duplicates         N           X         Field hlanks         N           Note:         A = Acceptable Not provided/applicable SW = See worksheet         ND = No compounds detected R = Rinsate FB = Trip blank EB = Equipment blank           Validated Samples:         A         CCS D           1         M-87         11         PC-122         21         PC-91         31           2         PC-98R         12         MW-K4         22         PC-97         32           3         PC-86         13         ARP-1         23         PC-17         33           4         PC-90         14         ARP-4A         24         PC-18         34           5         PC-56         15         ARP-5A         25         PC-55         35           6         PC-58         16         ARP-6B         26         L-635         36           7         PC-59         17         ARP-7         2			Junlica	ites		17	<u></u>	~		
VI.         Laboratory control samples         A         ∠ ∠ S         ∠ ∠ S D           VIII.         Sample result verification         N           VIII.         Overall assessment of data         A           IX.         Field duplicates         D           X         Field blanks         D           Note:         A = Acceptable N = Not provided/applicable SW = See worksheet         ND = No compounds detected R = Rinsate FB = Field blank         D = Duplicate TB = Trip blank EB = Equipment blank           Validated Samples:         11 PC-122         21 PC-91         31           2 PC-98R         12 MW-K4         22 PC-97         32           3 PC-86         13 ARP-1         23 PC-17         33           4 PC-90         14 ARP-4A         24 PC-18         34           5 PC-56         15 ARP-5A         25 PC-55         35           6 PC-58         16 ARP-6B         26 L-635         36           7 PC-59         17 ARP-7         27 L-637         37           8 PC-60         18 PC-53         28 M-87DUP         38			rup	100		11	<u> </u>	7		
VII.         Sample result verification         N           VIII.         Overall assessment of data         △           IX.         Field duplicates         ✓           X         Field blanks         ND = No compounds detected R = Rinsate FB = Trip blank EB = Equipment blank           Note:         A = Acceptable N = Not provided/applicable SW = See worksheet         ND = No compounds detected R = Rinsate FB = Trip blank EB = Equipment blank           Validated Samples:         A						<del>                                     </del>		1,,=		
VIII.         Overall assessment of data         △           IX.         Field duplicates         ✓           X         Field blanks         ✓           Note:         A = Acceptable N = Not provided/applicable SW = See worksheet         ND = No compounds detected R = Rinsate FB = Trip blank EB = Equipment blank           Validated Samples:         AAA         ✓           1         M-87         11         PC-122         21         PC-91         31           2         PC-98R         12         MW-K4         22         PC-97         32           3         PC-86         13         ARP-1         23         PC-17         33           4         PC-90         14         ARP-4A         24         PC-18         34           5         PC-56         15         ARP-5A         25         PC-55         35           6         PC-58         16         ARP-6B         26         L-635         36           7         PC-59         17         ARP-7         27         L-637         37           8         PC-60         18         PC-53         28         M-87DUP         38						1-	-3	L C 3 1)		
IX.   Field duplicates   X   Field hlanks   Note:   A = Acceptable   N = Not provided/applicable   SW = See worksheet   N = Field blank   EB = Equipment blank						<del>                                     </del>			<u>,</u>	
X   Field blanks   Note:   A = Acceptable   ND = No compounds detected   R = Rinsate   FB = Field blank   EB = Equipment blank						<u> </u>			· · · · · · · · · · · · · · · · · · ·	
Note: A = Acceptable	Y Y	)				$\vdash$				
1     M-87     11     PC-122     21     PC-91     31       2     PC-98R     12     MW-K4     22     PC-97     32       3     PC-86     13     ARP-1     23     PC-17     33       4     PC-90     14     ARP-4A     24     PC-18     34       5     PC-56     15     ARP-5A     25     PC-55     35       6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38	Validat	A = Acceptable N = Not provided/applicable SW = See worksheet	<u> </u>	R = Rin	sate	s dete	cted	TB = Trip I	blank	
6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38	1	M-87	11	PC-122			21	PC-91	31	
6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38	2									
6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38	3	PC-86	13						,	
6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38	4	PC-90	14							
6     PC-58     16     ARP-6B     26     L-635     36       7     PC-59     17     ARP-7     27     L-637     37       8     PC-60     18     PC-53     28     M-87DUP     38		PC-56								
7 PC-59 17 ARP-7 27 L-637 37 8 PC-60 18 PC-53 28 M-87DUP 38		PC-58	16							
8 PC-60 18 PC-53 28 M-87DUP 38		PC-59	17							
	9	PC-62	19	PC-103			29	PB	39	

Notes:		

20

MW-K5

30

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PC-68

LDC #: <u>21343</u>66 SDG #: <u>26357</u>7

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-27	$\mathcal{S}$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C, O <sub>4</sub> )
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
× 28	W	pH (DS)CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CNONH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:					
	 	 	- <del></del>		

# Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 2, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264580

# Sample Identification

PC-123

MD-3

PC-124

FB-1

PC-125

PC-123DUP

PC-126

FB-1MS FB-1MSD

PC-127

PC-128

PC-129

PC-130

PC-131

PC-132

M-96

PC-54

M-48

M-44

PC-71

PC-72 PC-73

PC-37

M-95

MD-1

# Introduction

This data review covers 25 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P	
M-95 MD-1	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р	
FB-1	Hexavalent chromium	35.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р	

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

# II. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

Sample FB-1 was identified as a field blank. No contaminant concentrations were found in this blank with the following exceptions:

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis Required Holding Time From Sample Collection Until Analysis		Flag	A or P	
M-95 MD-1	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	P	
FB-1	Hexavalent chromium	35.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р	

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

# II. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

Sample FB-1 was identified as a field blank. No contaminant concentrations were found in this blank.

# IV. 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.

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Although Total Dissolved Solids (TDS) were detected in sample FB-1, the laboratory reported the results as NA due to possible error in sample analysis. The field blank sample should not have high levels of TDS and the Specific Conductance test confirmed that the results did not match.

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples M-95 and MD-1 and samples PC-37 and MD-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration	222			
Analyte	M-95	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Hexavalent chromium	1.30 mg/L	1.26 mg/L	3 (≤30)	-	-	-
Total dissolved solids	7510 mg/L	7560 mg/L	1 (≤30)	-	•	-
Perchlorate	478000 ug/L	462000 ug/L	3 (≤30)	-	-	-

	Concer	ntration					
Analyte	PC-37 MD-3		RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	7370 mg/L	6750 mg/L	9 (≤30)	-	-	-	
Perchlorate	324000 ug/L	326000 ug/L	1 (≤30)	-	-		

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264580

SDG	Sample	Analyte	Flag	A or P	Reason	
264580	M-95 MD-1 FB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times	

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264580

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 264580

No Sample Data Qualified in this SDG

IDC#	: 21040B6	V۵	I IDATIO	N COMP	PLET	EN	ESS WORKS	HEET		Date: <u>२                                    </u>	
SDG#	: 264580 atory: MWH Laboratories				Level 2A					Page: of Neviewer: All 2nd Reviewer: Neviewer:	
	OD: (Analyte) <u>Hexava</u> d 160.1 SM 2540と)	alent	Chromium	(EPA SW	846 N	Meth	od 7196), Perch	lorate (E	PA M	ethod 314.0), TDS (EPA	
The sa validat	amples listed below were ion findings worksheets.	revi	ewed for ea	ch of the fo	ollowi	ing v	alidation areas. \	√alidatior	n findi	ngs are noted in attached	
	Validation	Area						Comme	nts		
l.	Technical holding times			5 W	Samp	oling d	lates: 2 2	109			
lla.	Initial calibration			N							
llb.	Calibration verification			N							
111.	Blanks			Α							
IV	Matrix Spike/Matrix Spike D	uplicat	es	A	}	M	SIMSDI	Dup			
V	Duplicates			Α				,			
VI.	Laboratory control samples			A	L	<u> </u>	LLSD				
VII.	Sample result verification			5\N_							
VIII.	Overall assessment of data			Α							
IX.	Field duplicates			حب	D	, :: (	9+20 1	52:18	+2	V Land 10th Sale And Thomas	
Lx	Field blanks		ND	250	F	B =	22			and the second s	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	s dete	cted	D = Duplica TB = Trip b EB = Equip	lank			
Validate	ed Samples:	1	we fr								
1	PC-123	11	M-96			21	MD-3		31		
	PC-124	12	PC-54			22	FB-1		32		
11 I	PC-125	13	M-48			23	PC-123DUP		33		
	PC-126	14	M-44			24	FB-1MS		34		
	PC-127	15	PC-71			25	FB-1MSD		35		

1	PC-123	11	M-96	21	MD-3 10 2	31	
1 2	PC-124	12	PC-54	1	FB-1	32	
3	PC-125	13	M-48	23	PC-123DUP	33	
4	PC-126	14	M-44	24	FB-1MS	34	
5	PC-127	15	PC-71	25	FB-1MSD	35	
6	PC-128	16	PC-72	26	PB	36	
7	PC-129	17	PC-73	27		37	
8	PC-130	18	PC-37 <sup>0</sup> ²	28		38	
9	PC-131	19	M-95 °,	29		39	
10	PC-132	l	MD-1 ° '	30		40	

Notes:			

LDC #: 2104086 SDG #: 264580

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

		Parameter
Sample ID	Matrix	
1-18,21	$\omega$	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ (CLO4)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
19-20,	رل	pH (TDS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC (CR C)
750		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
23	ω	pH (DS)CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
24-25	ىب	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
22	$\omega$	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR (CLO4)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	·	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<u> </u>		HIT TOO OF EINOS DOS ENS BUILD TOUR TOO OR

mments:

LDC #: 21040B6 SDG #: 264580

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	1	_of_	١
Reviewer:	_	A	
2nd reviewer.		$\overline{\setminus} \wedge$	$\overline{}$

All circled dates have exceeded the technical holding time.

(Y) N N/A

Were all samples preserved as applicable to each method?

(Y) N N/A

Were all cooler temperatures within validation criteria?

Y <u>)N_N/A_</u> Were all cod <b>Method:</b>	<u> </u>	7196			<u> </u>		
Parameters:		24 hrs					
Technical holding t  Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
19	2/2/29	2 3 09		(32.75 h	2)		J- NZ P
	0925	1714					
20	2/2/09	2 3 9		(32.75h	-2)		L
	0925	1714					
22	2/2/09	2 3 139		(35.75 L	(2)		1
	0533	1714					
					:		
					·		

LDC #: 21042 & CSDG #: 2445ro

# VALIDATION FINDINGS WORKSHEET Sample Result Verification

Page: of A Reviewer: A Q 2nd Reviewer

METHOD: Inorganics, Method

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*	Sainpie ID	v Cit	F 7 7 1	Ths and	<	
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			- Goo confir	confirmation by the	Les by running	
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			ans the and	and ysis of spe	Specialic was mutanes	
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			The variable	did mat match	1+4 and indicate	
			H. 2035, SG	ms of the	incorrect	
			-	١		
			45 Jimzs	daring anolysis.	This sample is	
				- 1	1	
			a Field Bl	Blank and his	4 TDS value	
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5	COLUMN TO THE PARTY OF THE PART					

LDC#	21040B6
SDG#:	See Cover

# **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

	Page:_	1	_of	1
	Reviewer:_	<	11	
2nd	Reviewer:		$\sim$	_

Inorganics, Method See Cover

N NA N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	ition (mg/L)	(< 20)	
Analyte	19	20	(≤ 30) RPD	
Hexavalent Chromium	1.30	1.26	3	
TDS	7510	7560	1	
Perchlorate (ug/L)	478000	462000	3	

	Concentra	tion (mg/L)	(< 20)	
Analyte	18	21	( <u>&lt;</u> 30) RPD	
TDS	7370	6750	9	
Perchlorate (ug/L)	324000	326000	1	

V:\FIELD DUPLICATES\FD\_inorganic\21040B6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 2, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264598

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

SF-1DUP

# Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

Sample FB-1 (from SDG 264580) was identified as a field blank. No contaminant concentrations were found in this blank.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Although Total Dissolved Solids (TDS) were detected in sample FB-1, the laboratory reported the results as NA due to possible error in sample analysis. The field blank sample should not have high levels of TDS and the Specific Conductance test confirmed that the results did not match.

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 264598

No Sample Data Qualified in this SDG

### LDC #: 21040C6 VALIDATION COMPLETENESS WORKSHEET

Level 2A

SDG #: 264598 Laboratory: MWH Laboratories

Reviewer: 4

METHOD: (Analyte)	Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1 らいこうり	
` , ,-		

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
J.	Technical holding times	A	Sampling dates:
IIa.	Initial calibration	N	·
IIb.	Calibration verification	N	
111.	Blanks	. A	
IV	Matrix Spike/Matrix Spike Duplicates	7	3 Dup
V	Duplicates		1
VI.	Laboratory control samples	A	LCS (LCS)
VII.	Sample result verification	5 W	
VIII.	Overall assessment of data		
IX.	Field duplicates	N	
_x_	Field blanks	10 500	FB= FB-1 (frm 264580)

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

### Validated Samples:

v and	ated Gampies.	مس س	<u>a t ~</u>			
1	ART-1	11	SF-1	21	31	
2	ART-2	12	PC-117	22	32	
3	ART-3	13	PC-118	23	33	
4	ART-4	14	PC-119	24	34	
5	ART-6	15	PC-120	25	35	
6	ART-7	16	PC-121	26	36	
7	ART-8	17	PC-133 <b>2</b>	27	37	
8	PC-99R2/R3	18	ART-9	28	38	
9	PC-115R	19	SF-1DUP	29	39	
10	PC-116R	20	PB	30	40	

Notes:				

LDC#: 21040CL SDG#: 264598

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: <u>\</u> of <u>\</u>	
Reviewer: A	
2nd reviewer:	

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
	1-18	ω	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Cl O <sub>4</sub> )
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ل	19	W	pH (DS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+
			ph tds ci f NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+

Comments:	

VALIDATION FINDINGS WORKSHEET Sample Result Verification

Page: \_\_of\_\_ Reviewer: \_\_A\_Q\_\_ 2nd Reviewer \_\_\_\_\_

METHOD: Inorganics, Method

LDC #: 21040CG SDG #: 264 598

*	Sample ID	Analyte	Lab Reporting Limit (units)	RDL (units)	Finding	Qualifications
	H	20T	Les reported	TDS an 1	Α.	
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			- 1	1		
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			-		This sample is	
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			1	012 6 4 1 6:	L TDS value	
			a ricia on	ĺ	1	
			-			
			صدر موغ و	*00014S:		
				2		
1						
Com	Comments:					

### Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 3, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264727

### Sample Identification

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-R

I-L

I-B

I-AR

I-PDUP

### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
I-U I-T	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	A

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

### II. Calibration

### a. Initial Calibration

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

The balance check was not performed for Total Dissolved Solids.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

The balance check was not performed for Total Dissolved Solids.

### III. Blanks

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

Method Blank ID	Analyte	Concentration	Associated Samples
MB (prep blank)	Total dissolved solids	12 mg/L	

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

No field blanks were identified in this SDG.

### IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

### VI. 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.

### VII. Sample Result Verification

All sample result verifications were acceptable.

### VIII. Overall Assessment of Data

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

### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264727

SDG	Sample	Analyte	Flag	A or P	Reason
264727	I-U I-T	Total dissolved solids	J- (all detects) R (all non-detects)	A	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264727

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 264727

No Sample Data Qualified in this SDG

SDG Labor	#:21040D6 #:_264727 ratory:_MWH_Laboratorie  HOD: (Analyte)Perchlo	EPA Metho	od 314.0),	Level 4 Stepe TDS (EPA		).1/2M7540c)	Date: 7/>//> Page: of Reviewer: 2nd Reviewer: gs are noted in attache	
valida	ation findings worksheets			T	T	and the latest and th		
	Validation	Area		SWA	<u> </u>		Comments	<del> </del>
I. 	Technical holding times			WX	T	lates: $> 3$		
lla.	Initial calibration			<del>     </del>	1 No 1	slankl c	being fr (b)	Tent 1
IIb.	Calibration verification			<del>     </del>				
III.	Blanks	\!:		SW	clien	<u> </u>	). I	
IV V				N N	C Island	Tspead	- n (	
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				1 1	- Virginia de la companya della companya della companya de la companya della comp	1	(4)	
VI. VII.				1	1 20	1149		
VIII.				<del>                                     </del>				
IX.				N	<u> </u>			
1 <u>/\                                   </u>	Field duplicates Field blanks							
Note:	A = Acceptable N = Not provided/applicabl SW = See worksheet	e	R = Rir	lo compound nsate ield blank	s detected	TB = T	uplicate rip blank Equipment blank	
Valida	ted Samples:		<del>,</del>					
1	I-O	11	I-M		21	MK	31	
2	I-P	12	I-D		22		32	
3	I-H	13	I-C		23		33	
14	I-U	14	I-S		24		34	
37	I-T	15	I-R		25		35	
6	I-G	16	I-L		26		36	
7	I-Q	17	I-B		27		37	
8	I-F	18	I-AR		28		38	
9	I-N	19	I-PDUP		29		39	
10	I-E	20			30		40	

Notes:

### VALIDATION FINDINGS CHECKLIST

Page: 1 of 1 Reviewer: WM 2nd Reviewer: \_\_\_\_\_\_

Method:Inorganics (EPA Method ) LL Color	<del></del>	<del></del>	<del>-</del>	
Validation Area	Yes	No	NA	Findings/Comments
Lactifical holding times			115	
All technical holding times were met.	ļ	/	ļ	
Cooker temperature criteria was met.	L L	440	24	
Were all instruments calibrated daily, each set-up time?	1		-	
Were the proper number of standards used?	<u> </u>		ļ	
Were all initial calibration correlation coefficients > 0.9957	<u>                                     </u>			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)	<u> </u>	_/	/	
Were balance checks performed as required? (Level IV only)		$\bigvee$	200	
Was a method blank associated with every sample in this SDG?	V	/		`
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	/	20 2400	0 4 N = 45	
COLOR DE LA SONO DE LA COLOR D				
Were a matrix spike (MS) and dupticate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	٧	1		No mis/pup for easy.
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil) was used for samples that were $\leq$ 5X the CRDL, including when only one of the duplicate sample values were $\leq$ 5X the CRDL.	/		i de circad	
			enconsumers)	
Was an LCS anaytzed for this SDG?				
Was an LCS analyzed per extraction batch?	-/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?		,		
Were performance evaluation (P.E.) samples performed?			4	
Were the performance evaluation (PF) samples within the acceptance limits?			<u> </u>	

LDC #:	~	0	doo
SDG #:		64	<u> </u>

### **VALIDATION FINDINGS CHECKLIST**

Page: Yof Y Reviewer: WM 2nd Reviewer: Y

Validation Area	Yes	No	NA	Findings/Comments
Viti. Sample flasilit. Verification				in a control of the c
Wore RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	7			
				MALIFIEL LES CONTRACTORS
Overall assessment of data was found to be acceptable.	1			
Field duplicate pairs were identified in this SDG.		7		
Target analytes were detected in the field duplicates.			/	
Field blanks were identified in this SDG.				/
Target analytes were detected in the field blanks.			1	

LDC #: ~104~りか SDG #: ~104~りか

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	_tot
Reviewer:	Mu
2nd reviewer:	A
-	<del></del>

All circled methods are applicable to each sample.

<u> </u>	
Sample ID	Parameter
1-18	PH (DS) CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+ (CUR)
1 10	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"
m19	PH (TDS) CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR° +
	ph tos ci f no, no, so, po, alk cn nh, tkn toc crot
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"
	ph tds ci f No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN' NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN' NH <sub>3</sub> TKN TOC CR <sup>0+</sup>
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	ph tds ci f no, no, so, po, alk cn nh, tkn toc cro+
	ph tds ci f NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CIF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN. NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CH NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CROT
	ph tds ci f No, No, So, Po, Alk CN NH, TKN TOC CRO+
	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CNT NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	ph tos ci f No, No, SO, PO, ALK CN' NH, TKN TOC CR°+
<u> </u>	pri tuo oi i no, no, so, fo, aux on nin, the too on

Comments:	• •

LDC #: 104006 SDG #: 16+74

### VALIDATION FINDINGS WORKSHEET <u>Technical Holding Times</u>

Page: of Reviewer: 2nd reviewer:

All circled dates have exceeded the technical holding time.

Y N W/A

Were all samples preserved as applicable to each method?

Were all cooler temperatures within validation criteria?

160,1/ Method: Parameters: Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier ( (6 hoh 4.5 2/3/09

LDC #: 2640 Db SDG #: 2647x7

## VALIDATION FINDINGS WORKSHEET

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7
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Reviewer: Page:

METHOD: Inorganics, Method \_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

YNNA Were all samples associated with a given method blank?
NNA Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below. ( Xo/ L)

											s		
									-				
(>10X)	u												
- 11	Sample Identification												
3,6-18	Sam				**************************************								
oles:													
Associated Samples: 2, 3, 6 - 18		,											
Asso													
	Blank	Action Limit	04)	,									
V	Maximum	ICB/CCB											
Conc. units: Jwy	Blank ID	[બાક	17										
Conc. unit	Analyte		Tws										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

LDC#: 2/24/2/ SDG#: 264/2/

METHOD: Inorganics, Method\_

## VALIDATION FINDINGS WORKSHEET Blanks

Page: Lof Reviewer: MH 2nd Reviewer:

Associated Samples (M/2m 01 / 9x Einding 3 Analyte 2/4/05

Comments:\_

LDC#: 2/040/6 SDG#: 2/040/2

# Validatin Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of Beviewer: 2nd Reviewer:

Method: Inorganics, Method \_\_\_\_\_

The correlation coefficient (r) for the calibration of  $\frac{\omega_0 q}{2}$  was recalculated. Calibration date:  $\frac{2/2^{a/2}}{2}$ 

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

Ę

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	r or r²	r or r²	(Y/N)
Initial calibration	•	s1	2	0.005			
	CIO4	s2	4	0.012	0.999452	0.999431	•
		s3	10	0.03			>
		84	25	0.069			
		S5	20	0.143	1		
		9s	100	0.303			
$\mathcal{C}\omega$ Calibration verification	hoon	vSu	13.		42.4	20	>
Calibration verification							
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

2040/c SDG #:

### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Reviewer: 2nd Reviewer: Page:

METHOD: Inorganics, Method

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = <u>Found</u> × 100 Where, True

Found . True m

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). concentration of each analyte in the source.

A sample and duplicate relative percent difference (RRD) was recalculated using the following formula:

RPD = <u>15-D1</u> × 100 Where, (S+D)/2

# # % Q

Original sample concentration Duplicate sample concentration

•					Receioulated	Reported	
Sample ID	Type of Analysis	Element	Found / S (unite)	True / D (unita)	%R / RPD	%R / RPD	Acceptable (Y/N)
	Laboratory control sample	- Colonia de la					
27		togs	N. V6	150	93.0	93.2	>
	Matrix spike sample	}	(\$\$R.&R)		-		
\$		-top					
	Duplicate semple						
61		7.b.s	13200	+ 82+	7,3	7.3	>

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_	No400}
SDG #:	<b>グレイファ</b> ク

### VALIDATION FINDINGS WORKSHEET

Cample	Calculation	Vorification
Sample	Calculation	vernication

Page:	_of	
Reviewer:	MH	
2nd reviewer:	9	
	1/	

						2nd reviewer	r: <del>}</del> _
METHOD: Inc	rganics, Metho	d	u c	w.			
Please see qu	alifications belo	w for all questions	answered	"N". Not app	licable questions	are identified as "I	N/A".
M N NA	Have results	been reported and	l calculated	correctly?			
N NA		thin the calibrated			ts?		
NN NA		ion limits below th					
Compound (a recalculated a	nalyte) results found vorified usin	or g the following eq	uation:	<u></u>	rep	orted with a positiv	e detect were
Concentration =			Recalculation	n:			
#\ c	loy = -	0.029	<del>هم</del> )	(97-	1	ر ایس	
•	U04 =	0.164		× 20 ···	- 176766		
					<b>5</b>	Colombated	1

		0.00487			
,	Sample ID	Anatyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	1	(104 (mg/v)	1770000	1970000	Y
		TO > (mis	14000	14000	$\nu$
		, (1)			
2		lo4 (m/4)	9070	9000	<u> </u>
		Tos (Mg/c)	9000	9020	V
			<u> </u>	. · 	
<u> </u>					
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Note:					
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### Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 3, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264774

### Sample Identification

I-AA

M-64

M-65

M-66

M-79 M-69

M-135

M-131

M-57A

M-99

M-25

M-37

MD-4

EB-1

**I-AADUP** 

EB-1MS

EB-1MSD

### Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-66	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	Р
M-37	Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
EB-1	Hexavalent chromium	31.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

### II. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

Sample EB-1 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	2/3/09	Perchlorate	162 ug/L	I-AA M-64 M-65 M-66 M-79 M-69 M-135 M-131 M-57A M-99 M-25 M-37

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

### IV. 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.

### V. Duplicates

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

### VI. 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.

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

### IX. Field Duplicates

Samples M-25 and MD-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration					
Analyte	M-25 MD-4		RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	9080 mg/L	9480 mg/L	4 (≤30)	-	-	-	
Perchlorate	441000 ug/L	442000 ug/L	0 (≤30)	-	-		

### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264774

SDG	Sample	Analyte	Flag	A or P	Reason
264774	M-66	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times
264774	M-37 EB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264774

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 264774

No Sample Data Qualified in this SDG

SDG Labo	#:21040E6 #:_264774 ratory:_MWH_Laboratories	3		L	evel 2	2A	SS WORKSHEET	Έρα	Date: ユーレー Page:of Reviewer: ム 2nd Reviewer: ム
Meth	od 160.1 SM2540C	)	Chiomium	(EPA SVV	040 IVI	<del>30100</del>	J 7190), Perchiorate (E	PA	Method 314.0), TDS (EPA
	samples listed below were ation findings worksheets		ewed for ea	ch of the fo	ollowin	g val	lidation areas. Validation	n find	dings are noted in attached
	Validation	Area					Comme	ents	
1.	Technical holding times			5.0	Samplii	ng da	tes: 2   3   39		
lla.	Initial calibration			N					
IIb.	Calibration verification			N					
111.	Blanks			Α					
IV	Matrix Spike/Matrix Spike D	uplicat	es	A	17 ~	12	MSD Dag		
V	Duplicates			A					
VI.	Laboratory control samples			Α	LC	2	LLSD		
VII.	Sample result verification			N					
VIII	Overall assessment of data			A			·····	····	,,
IX.	Field duplicates			<u></u> 5ພ	D: 11+13				
Lx	Field blanks			200	EB	<u> </u>	<u> </u>		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	)	R = Rin	o compounds sate eld blank	s detecte	∌d	D = Duplicate TB = Trip blank EB = Equipment blank		
Valida	ted Samples:								
1	I-AA	11	M-25		2	1		31	
2	M-64	12	M-37		2	2		32	
3	M-65	13	MD-4 <sup>5</sup>		2	3		33	
4	M-66	14	EB-1		2	4		34	
5	M-79	15	I-AADUP		2	5		35	
6	M-69	16	EB-1MS		2	6		36	
7	M-135	17	EB-1MSD		2	7		37	
8	M-131	18			2	8		38	
9	M-57A	19			2	9		39	
10	M-99	20			3	0		40	

Notes:\_

LDC #: <u>210406</u>6 SDG #: <u>26477</u>4

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of \_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
	1-11,13	ω	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Cl O <sub>4</sub> )
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	12,14	(ټ)	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC (CR6+) (C104)
I			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
د	15	w	pH (TDS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
.	16-17	w	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC (CR <sup>6+</sup> ) Clou
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
L			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
L			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L		<u> </u>	pH TDS CLF NO. NO. SO, PO. ALK CN. NH. TKN TOC CR6+

Comments:	

LDC #: 21043EC SDG #: 264374

### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

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Reviewer:	AI
2nd reviewer:	ے ما

All circled dates have exceeded the technical holding time.

Were all samples preserved as applicable to each method?

Were all samples preserved as applicable to each N/A Were all cooler temperatures within validation criteria? 160.15 Method: 125400 7196 Cr 6+ Parameters: てつる 7 days 24 hrs Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier (h) 4 2 3 3 2/19/39 J- | R | P (16 days) 2 4 39 (31.5 hrs) 12 8101 1748 14 2/4/09 (31.25 hrs) 1025 1748

LDC #: 2104066 \$DG#: 264774

## VALIDATION FINDINGS WORKSHEET

Field Blanks

2nd Reviewer: 1 Reviewer: 4

(cod. 62)

Page: \ of

METHOD: Inorganics, EPA Method\_ YN N/A

Were target analytes detected in the field blanks? Were field blanks identified in this SDG? YN N/A

Associated sample units:

Soil factor applied Blank units: යා ය Associa Sampling date: ය | ය | ය

	FR	
	Ather)	
-	/ Rinsate / Other	
	ank	
	type: (circle one) Field Bla	
•	eld blank type: (	
•	eld	

(x015) HI# toward Sample Identification Associated Samples: Blank ID 5 I C101 Analyte

Associated sample units: Blank units:

Sampling date: Soil factor applied Field blank type: (circle one) Field Blank / Rinsate / Other.

Associated Samples:

Sample Identification Blank ID Analyte

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC# <u>21</u> SDG#: <u>See</u>		VALIDATION FINDINGS WORKSHEET  Field Duplicates	Page: \_of_ Reviewer: 2nd Reviewer:
Inorganics,	Method See Cover		Zild Neviewei
ÝN NA ÝN NA		e pairs identified in this SDG? es detected in the field duplicate pairs?	

	Concentra	(4.20)		
Analyte	11	13	( <u>&lt;</u> 30) RPD	
TDS	9080	9480	4	
Perchlorate (ug/L)	441000	442000	0	

V:\FIELD DUPLICATES\FD\_inorganic\21040D6.wpd

### Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 4, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264820

### Sample Identification

M-92 M-97 M-31A M-52 M-50 M-34 M-35 M-19 M-39

M-12A EB-2 M-10 M-92DUP M-97MS M-97MSD EB-2MS EB-2MSD

M-68

M-61

M-67

M-74

M-73

M-88

I-V

I-K

I-J

I-Z

**|-|** 

### Introduction

This data review covers 28 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-12A	Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
EB-2	Hexavalent chromium	32 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-10	Hexavalent chromium	30.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

### II. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

Sample EB-2 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	2/4/09	Perchlorate	12 ug/L	M-92 M-97 M-31A M-52 M-50 M-34 M-35 M-19 M-39 M-68 M-61 M-67 M-74 M-73 M-73 M-88 I-V I-K I-J I-Z I-I

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

### IV. 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.

### V. Duplicates

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

### VI. 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.

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264820

SDG	Sample	Analyte	Flag	A or P	Reason
264820	M-12A EB-2 M-10	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264820

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 264820

No Sample Data Qualified in this SDG

SDG a	#:21040F6 #:_264820 :atory: <u>MWH Laboratories</u>		LIDATIO			E <b>TENE</b> el 2A	ESS WORKS	SHEET	Date: 구 / / / Page: _ / of _ / Reviewer: / / 2nd Reviewer: _ / / / / / / / / / / / / / / / / / /		
Metho	HOD: (Analyte) Hexava	)									
	amples listed below were ition findings worksheets.		wed for eac	ch of the to	vollc	ving va	alidation areas.	Validation finding	igs are noted in attached		
	Validation /	Area						Comments			
I,	Technical holding times			SW	Sar	mpling da	lates: 고 ( 너	1			
lla.	Initial calibration			N		<u> </u>					
Ilb.	Calibration verification			N							
III.	Blanks			A							
IV	Matrix Spike/Matrix Spike Du	A	?	M5	IMSD IDA	~ <del> </del>					
V	Duplicates			A							
VI.	Laboratory control samples			A	۷	LUS LUST					
VII.	Sample result verification			N							
VIII.	Overall assessment of data			Δ							
IX.	Field duplicates			\ \ \							
L <sub>x</sub>	Field blanks			<b>ಎ</b> ಲ	$\perp_{\epsilon}$	飞:2	22				
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet red Samples:		R = Rin	io compound nsate ield blank	s det	ected	D = Duplica TB = Trip b EB = Equip				
		T	<u> </u>		<del></del>	T					
1	M-92		M-61	<del></del>			M-12A	31			
2	M-97		M-67				EB-2	32			
3	M-31A		M-74				M-10	33	<del></del>		
4	M-52		M-73				M-92DUP	34			
5	M-50		M-88				M-97MS M-97MSD	35			
6	M-34		I-V				EB-2MS	36			
7	M-35	17	I-K			141	EB-ZIVIO	31			

PB

39

40

29

30

M-39

10 M-68

Notes:\_

19

20 |-|

I-Z

LDC #: 21040F6 SDG #: 264820

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID   Matrix	
pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>	
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Comments:	

LDC #: 21040F6 SDG#:264820

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

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All circled dates have exceeded the technical holding time.

Were all samples preserved as applicable to each method?

X)N N/A Were all cooler temperatures within validation criteria? 7196 Method: C - C+ Parameters: 24 hrs Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** date Sample ID date date date date date Qualifier 214/09 J- NJ P (L) 21 2/5/09 (31.5 h 1743 1013 22 2/4/09 (32 hrs) 2/5/09 0945 1743 2 |4 |09 | 2 | 5 | 09 23 (30,5 hs 1112 1743

LDC #: 21040F6 SDG #: 764820

# VALIDATION FINDINGS WORKSHEET

Field Blanks

anks

Page: of Reviewer: A & 2nd Reviewer:

Were field blanks identified in this SDG?   Were target analytes detected in the field   Blank units:   Associated sample units:   Associated sample units:   Associated sample units:   Associated sample   Associated sample   Associated sample   Associated sample   Associated   Associated	blanks identifient analytes dete	Were field blanks identified in this SDG? Were target analytes detected in the field by the field sample units:	blanks?				(090000)	, b c		
Field blank type: (circle one) Field Blank / Rinsate / Others	e) Field Blank	/ Rinsate / Others	EB	Associated Samples:	amples:	ALL	ty wh	Det my # # 22 (>10x)	>10x)	
Analyte	Blank ID				Sam	Sample Identification	ation			
	22									
C104	12									
Blank units: Ass	Associated sample units:	le units:								
Sampling date:	Soil factor applied	r applied								
Field blank type: (circle one) Field Blank / Rinsate / Other	e) Field Blank	/ Rinsate / Other:		Associated Samples:	amples:					

	tion					
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her:						
/ Rinsate / Ot						
Field Blank	Blank ID					
<b>ield blank type:</b> (circle one) Field Blank / Rinsate / Other.	Analyte					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264946

#### Sample Identification

M-87

M-70

M-71

M-72

M-22A

M-38

M-89

M-100

M-84

M-36

M-11

MD-2

M-87DUP

#### Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-100	Hexavalent chromium	30,25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-84 MD-2	Hexavalent chromium	29.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-36	Hexavalent chromium	29.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-11	Hexavalent chromium	30.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples M-84 and MD-2 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration				
Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
Hexavalent chromium	0.039 mg/L	0.044 mg/L	12 (≤30)	-	-	•
Total dissolved solids	980 mg/L	972 mg/L	1 (≤30)	-	-	-
Perchlorate	6970 ug/L	7030 ug/L	1 (≤30)	-	<del>-</del> ·	-

#### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264946

SDG	Sample	Analyte	Flag	A or P	Reason
264946	M-100 M-84 M-36 M-11 MD-2	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264946

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 264946

No Sample Data Qualified in this SDG

SDG#	t:21040G6 #:_264946 atory:_MWH_Laboratories		LIDATION			TENE el 2A	SS I	WORKSHEI	ET	Date: ¬ ( ) of Page: of
<u>Metho</u>	Hexava (Analyte) Hexava	)			····		······			
The sa	amples listed below were tion findings worksheets.	revie	wed for eac	ch of the f	ollo	wing va	lidatio	on areas. Valid	lation findir	ngs are noted in attached
	Validation A	Δr <u>ea</u>						Co	mments	
1.	Technical holding times			Sω	Sa	mpling da	tes:	2 5 0	9	
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike Du	uplicate	es	• A	Z	Da	>	(WS/WZ	s fra	204774)
V	Duplicates			А						
VI.	Laboratory control samples			Δ	1	-c 3	L C	z D		
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			5W	1	D : 9	+	12		
_ <u>x_</u>	Field blanks				<u> </u>					-2//
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	is de	etected		D = Duplicate TB = Trip blank EB = Equipment	blank	
Validat	ted Samples:	ب	w-+							
1	M-87	11_	M-11			21			31	
2	M-70	12	MD-2 D			22			32	
3	M-71	13	M-87DUP			23			33	
4	M-72	14	PB			24			34	
5	M-22A	15				25			35	
6	M-38	16				26			36	
7	M-89	17				27			37	
	M-100	18				28			38	

Notes:

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M-84 5

M-36

LDC #: 2104096
SDG #: 204946

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
Sample ID	Wattix	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Cl O <sub>4</sub> )
T		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
8-12	رب	pH (DS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC (CR) (Clos)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
u 13	w	pH (TDS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
,		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	,	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

omments:	_
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LDC #: 2104096 SDG #: 264946

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: \(\cdot\) of \(\cdot\) Reviewer: 🔥 2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y)N N/A Were all samples preserved as applicable to each method?

Why N/A Were all cooler temperatures within validation criteria?

N N/A Were all cool	er temperatures	within validation	criteria?	1			T
Method:		7196					
Parameters:		Cr6+					
Technical holding time:		24 hrs					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
8	2 5 39	2 6 39		(30.25	hrs)		J-/ UJ/P
	0918	1533					
		:					
9	2 5 39	2/6/09		(29.75	hrs)		1
,	0943	1533					
10	2/5/09	2/6/09		(29.5h	- 2 )		L.
	1002	1533					
1\	2/5/09	216109		(30.5 hu			
	09.05	1533					
		35 35 44					
12	2   5   39	2 6 39		(29.756	. )		l
	०१५०	1533					
		8 2 2					
		i i					
	JL	1	<u> </u>	1	<u> </u>		

LDC#	21040G6	
SDC#	See Cover	

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

	Page:_	1	of_	1
	Reviewer:	₫	ر	
2nd	Reviewer:		1	_

Inorganics, Method See Cover

$\bigcirc N$	NA
N(Y)	NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(< 20)		
Analyte	9	12	(≤ 30) RPD	
Hexavalent Chromium	0.039	0.044	12	
TDS	980	972	1	
Perchlorate (ug/L)	6970	7030	1	

V:\FIELD DUPLICATES\FD\_inorganic\21040G6.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 264958

#### Sample Identification

M-17A

M-76

M-75

M-115

M-14A

M-115MS

M-115MSD

#### Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 264958

No Sample Data Qualified in this SDG

SDG #	:21040H6 #:_264958 atory:_MWH_Laboratories		LIDATIOI		PLETE _evel 2		s woi	RKS	HEET		Date: ユ( )   Page: _ of _ \ Reviewer: \ 2nd Reviewer: _ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
METH	OD: (Analyte) Perchlo	rate (I	EPA Metho	d 314.0), <sup>-</sup>	TDS (E	PA Me	thod 16	0.1	5M25-	loc	
	amples listed below were tion findings worksheets.		wed for ea	ch of the f	following	yalida	ation ar	eas. \	/alidation	findir	ngs are noted in attached
	Validation	Area							Commer	nts	
1.	Technical holding times			$\triangle$	Samplir	ng dates	: 2	<u>ر</u>	09		
lla.	Initial calibration			N			,				
IIb.	Calibration verification			N							
III.	Blanks			Δ_							
IV	Matrix Spike/Matrix Spike D	uplicate	es	A	13 N	15/	MSI	>			
>	Duplicates		A		,						
VI.	Laboratory control samples			A	LC	5 / 4	<u> </u>				
VII.	Sample result verification		N								
VIII.	Overall assessment of data			A							
IX.	Field duplicates			N							
х	Field blanks			1							
Note; √alidate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	e 	R = Rin FB = Fi	o compound sate eld blank	ds detecte	ed	TB =	Duplica Trip bl Equipi			
1	M-17A	11			2	1			3	1	
	M-76	12			2				3	2	
	M-75	13			2				3		
	M-115	14			2				3	4	
	M-14A	15			2				3	5	
	M-115MS	16			2				3		
	M-115MSD	17			2	7			3	7	
8	PB	18			2	8			3	8	
9		19			2	9			3	9	
10		20			3	0			4	οT	

Notes:\_\_\_\_

LDC #: 2104040 SDG #: 264958

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_\_ Reviewer: \_\_A\_\_ 2nd reviewer: \_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-5	ω	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ C1 24
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
6-7	w	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C(2)
<u> </u>		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 9 through February 12, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

PC-18 PC-55

L-635

L-637

**ARP-5ADUP** 

PC-103DUP

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 265481

Sample Identification

MW-K4

ARP-1

ARP-4A

AIII -4/

ARP-5A

ARP-6B

PC-53

PC-103

MW-5K

M-87

PC-98R

PC-86

PC-90

PC-56

PC-58

PC-59

PC-60

PC-62

PC-68

PC-91

PC-97

#### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	14 mg/L	PC-103 PC-98R PC-86 PC-90 PC-56 PC-58 PC-59 PC-60 PC-62 PC-68 PC-91 PC-97 PC-18 PC-55 L-635

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

No field blanks were identified in this SDG.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 265481

No Sample Data Qualified in this SDG

SDG : Labor	#: <u>21040l6</u> #: <u>265481</u> atory:_ <u>MWH Laboratories</u>	<u> </u>		L	_ev	rel 2A	ESS WORK		Date: ¬
METH	HOD: (Analyte) Perchlor	<u>rate (</u>	EPA Method	d 314.0),	TDS	S (EPA	Method 160.	1) SM25436	
	amples listed below were tion findings worksheets.		ewed for each	ch of the f	ollo	wing va	alidation areas	s. Validation findir	ngs are noted in attached
	Validation	Area						Comments	
l.	Technical holding times			Δ	Sa	mpling da	ates: 2 9	- 2   12	১৭
lla.	Initial calibration			N					
IIb.	Calibration verification			N					
III.	Blanks			SW	T_				
IV	Matrix Spike/Matrix Spike Du	uplicat	es	Δ	12	Das	(MSIM	.50 fra 26	4958)
V	Duplicates	<u></u>		Δ	$\prod$				
VI.	Laboratory control samples			A	T.	L-C5]	L(-5D		
VII.	Sample result verification			N	<u> </u>				
VIII.	Overall assessment of data			A					
IX.	Field duplicates			12	<u> </u>				
x	Field blanks			i					
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	,	R = Rins	o compound sate eld blank	ls de	etected	D = Dup TB = Trij EB = Eq		
	MW-K4	11	PC-86 ·			21	PC-18 ·	31	
2	ARP-1	12	PC-90 ·				PC-55 -	32	
3	ARP-4A	13	PC-56 ·				L-635 .	33	
4	ARP-5A	14	PC-58 ·			24	L-637	34	
5	ARP-6B	15	PC-59				ARP-5ADUP	35	
6	PC-53	16	PC-60 ·			26	PC-103DUP	36	•
7	PC-103 ·	17	PC-62 ·			27	PB	37	
8	MW-5K	18	PC-68 '			28		38	
9	M-87	19	PC-91 -			29		39	

PC-98R ·

Notes:\_

20

PC-97

LDC #: 21040IC SDG #: 265481

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

1			
	Sample ID	Matrix	<u>Parameter</u>
	1-24	$\omega$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Cl O <sub>4</sub> )
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
عد	25-26	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
.			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
ŀ			PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
1			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
F			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CLF NO, NO, SO, PO, ALK CN: NH, TKN TOC CR6+

Comments:	

LDC #: 21343 IG SDG #: 2 C\$ 481 METHOD: Inorganics, Method \_\_\_

## VALIDATION FINDINGS WORKSHEET

Page: 1 of Reviewer: 2nd Reviewer:

( 20 - 61)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y. N. N/A. Were all samples associated with a given method blank?

(Y. N. N/A. Were all samples associated with a given method blank?

(Y. N. N/A. Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Ī		<del>                                     </del>	T	-	 	1			ī	1	1	<del></del>	1	 <del></del> 1	—	
Conc. units: つこし Associated Samples: 子,(こ・23 (> to x)	Sample Ident															
													·			
			,								·					
	Blank Action Limit		011													
	Maximum ICB/CCB															
	Blank ID	PB	11													
	Analyte		T 25													

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

February 17, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 265658

Sample Identification

M-23

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample Analyte		Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P	
M-23	Total dissolved solids	36 days	7 days	J- (all detects) R (all non-detects)	P	

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	10 mg/L	All samples in SDG 265658

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

#### VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 265658

SDG	Sample	Analyte	Flag	A or P	Reason		
265658	M-23	Total dissolved solids	J- (all detects) R (all non-detects)	P	Technical holding times		

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 265658

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 265658

No Sample Data Qualified in this SDG

SDG i Labor	#: 265658 ratory: MWH Laboratories	VALIDATIO	L	evel 2A			Page:of Reviewer: <b>A</b> 2nd Reviewer: <b>_</b>
METH	HOD: (Analyte) Perchlora	ate (EPA Metho	<u>id 314.0),      </u>	ΓDS (EPA	Method 16	0.1 SM 25	<u></u>
	samples listed below were i ation findings worksheets.	reviewed for ea	ch of the fo	ollowing va	lidation are	eas. Validatio	on findings are noted in attache
	Validation A	Area				Comm	nents
1.	Technical holding times		కట	Sampling da	ates: 2	17/00	3
lla.	Initial calibration		N				
IIb.	Calibration verification		N				
111.	Blanks		sω				
IV	Matrix Spike/Matrix Spike Dup	plicates	N	3 01:	~ + S;	on: find	ī
V	Duplicates		7		1		
VI.	Laboratory control samples		A	LCS	L C S D		
VII.	Sample result verification		N	<u> </u>		***************************************	
VIII.	Overall assessment of data		A_				
IX.	Field duplicates		N			<del></del>	
Lx	Field blanks						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	lo compounds nsate ield blank	s detected	TB = 1	Duplicate Trip blank Equipment blan	nk
Validat	ted Samples:	120 L					
1	M-23	11		21			31
2		12		22			32
3		13		23			33
4		14		24			34

1	M-23	11	21	31
2	PB	12	22	32
3		13	23	33
4		14	24	34
5		15	25	35
6		16	26	36
7		17	27	37
8		18	28	38
9		19	29	39
10		20	30	40

Notes:	

LDC#: 2104076 SDG#: 265658

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	<u>of</u>
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2nd reviewer:	「い

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1	$\omega$	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C1 34)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:

LDC #: 2104056 SDG #: 265658

# VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page:_	70	f_\_
Reviewer:_	A	e
2nd reviewer:		1./

All circled dates have exceeded the technical holding time.

Ý)N N/A	Were all samples preserved as applicable to each method?
V 101 KI/A	Where all campies presented as applicable to each method a
1 /14 /14/75	- vvete ali sattivies dieserveu as abblicable lu cacit melliou :

YN N/A Were all cooler temperatures within validation criteria? 160.1 SM2540C Method: ZGT Parameters: 7 days Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier 3/25/09 J- R P (h) 2/17/09 (36 day

LDC # 2 134056 SDG #: 265658 METHOD: Inorganics, Method

# VALIDATION FINDINGS WORKSHEET

Page: 1 of 1 Reviewer: 🛧 🕽 2nd Reviewer:

Blanks

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y\_N N/A Were all samples associated with a given method blank?

(Y\_N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

	uo											
(×9/<)	Sample Identification											
Der	San											
ples:												
Associated Samples:												
Asse												
	Blank	Action Limit	001									
I	Maximum											
s: m lt	Blank ID	78	13									
Conc. units:   L	Analyte		103									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

March 2, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 266452

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-7

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

#### Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PC-120 PC-133	Total dissolved solids	13 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 266452

SDG	Sample	Analyte	Flag	A or P	Reason
266452	PC-120 PC-133	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 266452

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 266452

No Sample Data Qualified in this SDG

SDG#	#:21040K6 #:_266452 atory:_MWH Laboratories		LIDATIO		LETENESS evel 2A	WORKSI	HEET	Date: ¬ ( ( ) )  Page: _ of _ ( )  Reviewer: _ ( )  2nd Reviewer: _ ( )
METH	HOD: (Analyte) Perchlor	ate (	EPA Method	<u>d 314.0), T</u>	「DS (EPA Met	hod 160.1	3M2840C	<u> </u>
	amples listed below were tion findings worksheets.	revie	ewed for each	ch of the fo	ollowing valida	tion areas. V	/alidation findino	gs are noted in attached
	Validation A	Area					Comments	
I.	Technical holding times			20	Sampling dates:	3   2	109	
lla.	Initial calibration			N			`	
IIb.	Calibration verification			N				
III.	Blanks			A_				
IV	Matrix Spike/Matrix Spike Du	uplicat	.es	2	3 Clin	+ Spec	: f:-1	
V	Duplicates			2		•		
VI.	Laboratory control samples			A	Lesle	- 27		
VII.	Sample result verification			N				
VIII.	Overall assessment of data			A				
IX.	Field duplicates			N				
Lx_	Field blanks					***************************************		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	lo compounds isate ield blank	s detected	D = Duplicat TB = Trip bla EB = Equipr	ank	
Validate	ed Samples:	سرر	-L	·				
1	ART-1		PC-118		21		31	
	ART-2	12	PC-119		22		32	
	ART-3	13	PC-120		23		33	
	ART-4	14	PC-121		24		34	
5	ART-7	15	PC-133		25		35	

21040K6W.wpd

PC-99R2/R3

PC-115R ·

PC-116R

SF-1

10 PC-117

Notes:\_\_\_

ART-9

PB

LDC #: <u>21040 K</u> 6 SDG #: <u>26645</u>2

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-16	$\omega$	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR C C C
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 21040126 SDG #: 266 452

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>\</u> of <u>\</u>
Reviewer:	A
2nd reviewer:	11

All circled dates have exceeded the technical holding time.

YN N/A

Were all samples preserved as applicable to each method?

N/A

Were all cooler temperatures within validation criteria?

Method:		160.1 SM						-
Parameters:		TDS						
Technical holding tir	me:	7 days						
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
13, 15	3/2/09	3 15 109		(13 days)			J-   UJ   P	(4)
				-41				
						-		
			-					

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

March 9 through March 11, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 267194

## Sample Identification

M-87 PC-103 PC-98R MW-K5 PC-86 ART-8

PC-90

PC-56

PC-58

PC-59

PC-60

0-00

PC-62

PC-68

PC-91

PC-97

PC-18

PC-55

MW-K4

ARP-1

ARP-4A

ARP-5A

ARP-6B

PC-53

#### Introduction

This data review covers 23 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 267194

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 267194

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 267194

No Sample Data Qualified in this SDG

# LDC #: 21040L6 VALIDATION COMPLETENESS WORKSHEET SDG #: 267194 Level 2A Laboratory: MWH Laboratories

Page: 7 ( 1/5°

Reviewer: 4/

2nd Reviewer:

METHOD: (Analyte)	Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) 5M 254 0C)	
, , , , , , , , , , , , , , , , , , , ,		

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 3   4 → 3   11   5 9
lla.	Initial calibration	N	
llb.	Calibration verification	N	
III.	Blanks	Δ	
IV	Matrix Spike/Matrix Spike Duplicates	2	? Cl. A Specified
V	Duplicates	7	
VI.	Laboratory control samples	٨	Les / Les
VII.	Sample result verification	N	
VIII.	Overall assessment of data	<b>A</b>	
IX.	Field duplicates	2	
L <sub>x</sub>	Field blanks	2	

Note:

A = Acceptable

SW = See worksheet

N = Not provided/applicable

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

	مم	ر ب				
1	M-87	11	PC-91	21	PC-103	31
2	PC-98R	12	PC-97	22	MW-K5	32
3	PC-86	13	PC-18	23	ART-8	33
4	PC-90	14	PC-55	24	PB	34
5	PC-56	15	MVV-K4	25		35
6	PC-58	16	ARP-1	26		36
7	PC-59	17	ARP-4A	27		37
8	PC-60	18	ARP-5A	28		38
9	PC-62	19	ARP-6B	29		39
10	PC-68	20	PC-53	30		40

Notes:			

LDC #: <u>21040</u>66 SDG #: <u>267194</u>

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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2nd reviewer:		10	

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
1-23	W	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C1 24)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

April 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 268707

## Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-120

PC-121

PC-133

ART-9

#### Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 268707

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 268707

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 268707

No Sample Data Qualified in this SDG

SDG	#:21040M6 #:_268707 ratory:_MWH_Laboratories		ALIDATIOI		PLET Level			RKSH	IEET	Date: ¬ [ . [ . Page: of Reviewer: 2nd Reviewer:
	HOD: (Analyte) Perchlo									
	samples listed below were ation findings worksheets.		ewed for eac	ch of the r	iollowir	ng va	alidation ar	reas. va	alidation findin	igs are noted in attached
	Validation	Area							Comments	
1.	Technical holding times			Δ	Sampl	Sampling dates: 식				
lla.	Initial calibration			N				` -		
IIb.	Calibration verification			N					····	
III.	Blanks				<u> </u>	<del> </del>				
IV	Matrix Spike/Matrix Spike Du	uplicat	es	N	} clint Specified					
V	Duplicates			N						
VI.	Laboratory control samples			A	لسد	. 5	LC30			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	. Field duplicates			2						
X	Field blanks			2						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	ŀ	R = Rins	o compound: sate eld blank	ls detec	ted	TB =	Duplicate Trip blar Equipme		
/alidat	ted Samples:	<u>u</u>	went							
1	ART-1	11	PC-117			21			31	
2	ART-2	12	PC-118			22			32	
	ART-3	13	PC-120			23			33	
4	ART-4	14	PC-121			24			34	
5	ART-7	15	PC-133			25			35	
6	ART-8	16	ART-9			26			36	
7	PC-99R2/R3	17	PB			27			37	
8	PC-115R	18				28			38	

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SF-1

Notes:\_

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LDC #: 21040M6 SDG #: 268707

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
1-16	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C1 24)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN <sup>-</sup> NH, TKN TOC CR <sup>6+</sup>

Comments:	

# Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

April 14 through April 15, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 269377

## Sample Identification

MW-K4

PC-18

ARP-1

PC-55

ARP-4A

PC-101R

ARP-5A

ARP-6B

PC-53

PC-103

MW-K5

M-87

PC-98R

PC-86

PC-90

PC-56

PC-58

PC-59

PC-60

PC-62

PC-68

PC-91

PC-97

#### Introduction

This data review covers 23 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 269377

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 269377

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 269377

No Sample Data Qualified in this SDG

SDG#	#:21040N6 #:_269377 ratory:_MWH Laboratories	_	LIDATIO		<b>PLE</b> 1 Leve		ESS WORK	SHEET	Date: Page: of Reviewer: 2nd Reviewer:	
METH	HOD: (Analyte) Perchlo	<u>rate (</u>	(EPA Metho	d 314.0),	TDS	<u>(EPA</u>	Method 160.1	1) 5M2540C		
	amples listed below were tion findings worksheets.		ewed for ea	ch of the f	follow	ing v	alidation areas	s. Validation findir	ngs are noted in attached	
	Validation	Area						Comments		
l.	Technical holding times			A	Sam	npling d	dates: 4 \	A > 4 1:	5 09	
IIa.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			A						
IV	Matrix Spike/Matrix Spike Du	uplica	tes	12	] Clint Specified					
V	Duplicates		11 - 11 - 11 - 11 - 11 - 11 - 11 - 11	N						
VI.	Laboratory control samples			A	1	CZ	16650			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			12				· · · · · · · · · · · · · · · · · · ·		
	Field blanks			7						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<b>;</b>	R = Rins	lo compound	Is dete	cted	D = Dupli TB = Trip EB = Equ			
	ed Samples:	<u>. w.</u>	<u>-</u> L							
	MW-K4	11	PC-86			21	PC-18	31		
2 /	ARP-1	12	PC-90			22	PC-55	32		
3 /	ARP-4A	13	PC-56			23	PC-101R	33		
4	ARP-5A	14	PC-58			24	PB	34		
5	ARP-6B	15	PC-59			25		35		
6 F	PC-53	16	PC-60			26		36		
7 F	PC-103	17	PC-62			27		37		
8 1	MW-K5	18	PC-68			28		38		
9 1	M-87	19	PC-91			29		39		

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20 PC-97

10 PC-98R

Notes:\_

LDC #: 2104006 SDG #: 269377

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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2nd reviewer:	74/

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-23	_	
1-23	$\omega$	pH (TDS) CL F NO NO SO PO ALK CN' NH TKN TOC CR6+ (CL O4)
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
		pH TDS CLE NO. NO. SO. BO. ALK CN: NH. TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO. NO. SO. BO. ALK CN: NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
· · · · · · · · · · · · · · · · · · ·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 4, 2009

LDC Report Date:

July 30, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A & 4

MD-1\*\*

PC-129DUP

MD-1MS

MD-1MSD PC-126DUP

MD-3

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270339

#### Sample Identification

PC-123\*\* PC-124\*\*

PC-125\*\*

PC-126\*\*

PC-127\*\* PC-128\*\*

PC-129\*\*

PC-130\*\*\*

PC-131\*\*

PC-132\*\*\*

M-96\*\*

PC-54\*\*

PC-37\*\*

PC-71\*\*

PC-72\*\*

PC-73\*\*

M-23\*\*\*

M-95\*\*

M-44\*\*

FB-1

<sup>\*\*</sup>Indicates sample underwent Stage 4 review

<sup>\*\*\*</sup>Indicates sample underwent Stage 4 review for Total Dissolved Solids and Perchlorate only

#### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen, EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a Stage 4 review. A Stage 2A review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Stage 2A criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PC-129** PC-130*** M-96** PC-129DUP	Total dissolved solids	18 days	7 days	J- (all detects) R (all non-detects)	А
M-95** MD-1** MD-1MS MD-1MSD	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-44**	Hexavalent chromium	32.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
FB-1	Hexavalent chromium	33.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Þ
PC-124** PC-130***	Nitrate as N	51 hours	48 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

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

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB-1 was identified as a field blank. No contaminant concentrations were found in this blank.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. 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.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples M-95\*\* and MD-1\*\* and samples PC-54\*\* and MD-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Conce	ntration					
Analyte	M-95** MD-1**		RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	6950 mg/L	7240 mg/L	4 (≤30)	-	-	-	
Hexavalent chromium	1.14 mg/L	1.14 mg/L	0 (≤30)	-	-	-	
Perchlorate	445000 ug/L	464000 ug/L	4 (≤30)	-	-	•	

	Concer	ntration					
Analyte	PC-54**	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	6050 mg/L	6280 mg/L	4 (≤30)	-	-	-	
Perchlorate	226000 ug/L	237000 ug/L	5 (≤30)	-	-	-	

#### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270339

SDG	Sample	Analyte	Flag	A or P	Reason
270339	PC-129** PC-130*** M-96**	Total dissolved solids	J- (all detects) R (all non-detects)	Α	Technical holding times
270339	M-95** MD-1** M-44** FB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times
270339	PC-124** PC-130***	Nitrate as N	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270339

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270339

No Sample Data Qualified in this SDG

									1			
	#:2104006	VA	LIDATIO				ESS WORKSHEET	-	Date: <u>1/ソ</u> )			
	#: 270339			Le	evel	1 <b>2A</b> /4	<b>.</b>		Page:of Reviewer:			
Labor	aboratory: <u>MWH Laboratories</u> Reviewer:											
·	· · · · · · · · · · · · · · · · · ·			:=== 0\44	40	* # - *F.	17100) Developmen	· ^				
MET: Meth	<b>HOD: (Analyte)</b> Hexava od 160.1 <b>)</b> , Chlorate, Nitral	alent te-N	Chromium ( FPA SW84	(EPA Svv 6 Method	<u>846 i</u> 9056	Metno 6)	od 7196), Percniorate	EPA I	Method 314.0), TDS (EPA			
									dings are noted in attached			
	samples listed below were ation findings worksheets.		ewed for eac	ch of the to	ollow	/ing va	alidation areas. Validati 	on tind	dings are noted in attached			
	Validation	Area					Comr	nents				
I.	Technical holding times			Sw	Sam	npling d	ates: 5/4/09					
lla.	Initial calibration			A_			ed for Level 2A validation.					
IIb.	Calibration verification			A_	Not	review	ed for Level 2A validation.					
III.	Blanks			A								
IV	Matrix Spike/Matrix Spike Du	uplicat	ies	Á		7	mc/ MSB/ Dup					
V	Duplicates			A	<u> </u>	<del></del>	·/ / /					
VI.				A	L	45/2	.40					
VII.				A		Not reviewed for Level 2A validation.						
VIII.				A								
IX.	Field duplicates			SW	1	(8,	21), (12,22)					
Lx	Field blanks			Mo	Ţ	-B=	~ vo					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins FB = Fie	eld blank			D = Duplicate TB = Trip blank EB = Equipment bla					
Validat	ted Samples ** Indicates samp	ple und	Jerwent Level 4	4 validation,	*** Inc	dicates	sample underwent Level 4 v	/alidatio				
1	PC-123**	11	M-96**			21	MD-1**	31	hrs			
2	PC-124**	12	PC-54**			22	MD-3	32				
3	PC-125**	13	PC-37**			23	PC-129DUP	33				
4	PC-126**	14	PC-71**			24	MD-1MS	34				
5	PC-127**	15	PC-72**			25	MD-1MSD	35				
6	PC-128**	16	PC-73**			26	PC-1>6 pup	36				
7	PC-129**	17	M-23***			27		37				
8	PC-130***	18	M-95**			28		38				
9	PC-131**	19	M-44**			29		39				


30

FB-1

20

Notes:\_

#### **VALIDATION FINDINGS CHECKLIST**

Page: 1 of 1
Reviewer: WM
2nd Reviewer:

Method: Inorganics (EPA Method See Loyer

Validation Area	Yes	No	NA	Findings/Comments
Credutes houng trees	idi			And in the last consistence
All technical holding times were met.		U		
Coolor temperature criteria was met.		10 H2 150		2010 <b>1</b> 210 1211 1211 1210 1210 1210 1210 1210
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients > 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)	/-			
Were balance checks performed as required? (Level IV only)				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				,
			W.	77
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	1			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	/			
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil) was used for samples that were $\leq$ 5X the CRDL, including when only one of the duplicate sample values were $\leq$ 5X the CRDL.	/			
Was an LCS anaytzed for this SDG?			_	
Was an LCS analyzed per extraction batch?	-/		$\dashv$	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?				
o nario de la Kista e latouar cara de la				
Were performance evakuation (PE) samples performed?	$\bot$		4	
Were the performance evaluation (PF) samples within the acceptance limits?			⊿	

LDC # 7/0 40 06 SDG # 7/0 33

#### VALIDATION FINDINGS CHECKLIST

Page: Yof Y Reviewer: WM 2nd Reviewer: 1

Validation Asso	T	Τ	T.,,	
Validation Area  MUSample flasur Neiflicauni	Yes	No	I NA	Findings/Comments
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1			
Were detection limits < RL?	/			
Overall assessment of data was found to be acceptable.				
Fleld duplicate pairs were identified in this SDG.	V,			
Target analytes were detected in the field duplicates.				
Field blanks were identified in this SDG.	/	1		
Target analytes were detected in the field blanks.		/		

LDC #: 104006 SDG #: 1033

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	
Reviewer:	Ми
2nd reviewer:	·
^	7

All circled methods are applicable to each sample.

Sample ID	Parameter
1-22	PH TOS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+ (LOC)
2.468,10,11	7 PH TDS CI F (NO) NO SO, PO, ALK CN NH, TKN TOC CRO+ (44 mt)
18-21	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC (CR°)
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR°+
W-27116	PH(TD\$ CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
V4.75	PH TOS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC (CR°+)
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CIF NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	PH TDS CIF NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN. NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR"+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRS+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN" NH3 TKN TOC CR"+
	PH TDS CIF NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+

Comments:	55

LDC #: >104006 SDG #: >70339

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Reviewer: 2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y) N N/A

Were all samples preserved as applicable to the samples preserv Were all samples preserved as applicable to each method? Were all cooler temperatures within validation criteria?

Y) N N/A Were all	cooler tempera	tures within vali	dation criteria?_			4		
Method:		160,1/	F43545	7196				
Parameters:		Tos		Wet				
Technical holding tir	ne:	2 Jaga		nh				
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
7,8,11,23	5/4/09	5/22/09	(18 ty	~ )			J-/R/A	(Ly
18 21	5/4/1		2/2/3	(32.)	5 hy)		J-/wy	
	514/m 1033	·	5/5/2) (853	(32,2	5h)			,
20	5/41.906		5/5/5 (183)		<b>ナ</b> ん)			
		****						

LDC #: > 0606 SDG #: - 1003

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

2nd reviewer:

All circled dates have exceeded the technical holding time.

Y N N/A Were all samples preserved as applicable to W N N/A Were all cooler temperatures within validations. Were all samples preserved as applicable to each method? Were all cooler temperatures within validation criteria?\_

Method:		4. 7						
Parameters:		9.56						
		103-N 49-	•					
Technical holding tir								
Sample ID	Sampling date	Analysis , date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
À	54109	date	(#S			,		il .
							/1	
8	5141.9	5/6/29 838	(511	<u>~)</u>			J-/ng/p	(4)
			·					
			·,, · · · · · · · · · · · · · · · · · ·					

LDC#	2104006	
SDG#:	See Cover	

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	of_	<u>)</u>
Reviewer:	1/	_
2nd Reviewer:	(	7

Inorganics, Method See Cover

Y)N NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	ition (mg/L)	(z 20)	
Analyte	18	21	( <u>&lt;</u> 30) RPD	
TDS	6950	7240	4	
Hexavalent Chromium	1.14	1.14	0	
Perchlorate (ug/L)	445000	464000	4	

	Concentra	tion (mg/L)	(< 20)	
Analyte	12	22	( <u>&lt;</u> 30) RPD	
TDS	6050	6280	4	
Perchlorate (ug/L)	226000	237000	5	

V:\FIELD DUPLICATES\FD\_inorganic\2104006.wpd

 $\frac{100 \pm 20 \pm 00}{100}$ 

# Validatin Findings Worksheet Initial and Continuing Calibration Calculation Verification

Method: Inorganics, Method

The correlation coefficient (r) for the calibration of  $\omega \rho_2$  was recalculated. Calibration date:  $\tau / 2 \circ l \circ f$ 

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100

Where, Fou

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

t)

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	r or r²	r or r²	(Y/N)
Initial calibration		s1	10	0.007			
	CIO3	s2	20	0.015	0.999967	0.999972	>
		s3	100	0.076			_
****		s4	200	0.149			
		SS	400	0.302			
		9S	800	0.612			
CLV Calibration verification	/~-{g~	0~	66^1		1-66	VR	7
Calibration verification	402	*	1,4%		46.4	976	
Calibration verification	4900	70.0	70.0		0c )	20)	>

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

# **VALIDATION FINDINGS WORKSHEET** Level IV Recalculation Worksheet

Page: of Andewer: wunderdever:

METHOD: Inorganics, Method

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = <u>Found</u> × 100 Where, True

Found .

True #

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result), concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

# # % Q RPD = <u>iS-Di</u> × 100 Where, (S+D)/2

Original sample concentration Duplicate sample concentration

	•				Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (unite)	True / D (unite)	%R / RPD	%R / RPD	Acceptable (Y/N)
	Laboratory control sample						•
75		N-LON)	7.5	2.5	98	980	<u> </u>
	Matrix spike sample	to	(SSR-SR)				
3		- 3	Sporo	500	01)	011	
	Dupilate semple	17	0414	926	7	9 (	
47		\ a \	-		8	~~~	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated esults.

LDC #:_	104006
	M0339

#### **VALIDATION FINDINGS WORKSHEET**

Sample Calculation Verification

Page:		
Reviewer:	МИ	
nd reviewer:	<u> </u>	

SDG#: ∾์//งวิ	ρ Sample Calculation ventication Reviewer. <u>Μ</u> Η
SDG #: 3	2nd reviewer:
METHOD: Inorga	ics, Method Sel Cover
Please see qualific	ations below for all questions answered "N". Not applicable questions are Identified as "N/A".
MN NA H	ve results been reported and calculated correctly?
ON NA A	e results within the calibrated range of the instruments?
PN NA A	e all detection limits below the CRQL?
	,
Compound (analy	e) results for
compound (analy	orified using the following equation:
( SCALCOLAGO ALIC	and doing the following of the first of the
Concentration =	Recalculation:
· L 18 /	+ 0104 10
18 10 (10	= lon my
W	t= 0.104 X 10 = 1.938 X 0.5 = 1.09 mg/
	1-1/0

	Sample ID	Analyt•	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	2	chlants (vol.)  ceo.y  Noz. N (vol.)	11400	114000	4
		cof, 1,	5310	2310	
		NO3 N ( 18/2)	20	<b>W</b> _0	
		The	1350	N350	<b>-</b>
~	18	ceore (vgh)	445000	445000	<del>                                     </del>
		Coft (myle)	1-14	6950	
		cost (mg/s)	6950	6950	1
		<u> </u>			
e de la companya de l					
					<u> </u>
					<u> </u>
				<u> </u>	
				٠	

Note:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270369

Sample Identification

M-5A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 (from SDG 270390) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	5/5/09	Perchlorate	159 ug/L	All samples in SDG 270369

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:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-5A	Perchiorate	397 ug/L	397J+ ug/L

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270369

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270369

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270369

SDG	Sample	Analyte	Modified Final Concentration	A or P
270369	M-5A	Perchlorate	397J+ ug/L	Α

SDG#	: <u>21040P6</u> ± 270369 atory: <u>MWH Laboratories</u>	<b>VA</b>	LIDATIO		PLETE		SS WOI	RKS	HEET		2nd	Date: ¬ / 1 / Page: _ 1 of _ 1 Reviewer: C
METH	OD: (Analyte) Perchlor	ate (	EPA Metho	od 314.0),	TDS (EF	PA I	Method 16	0.1	5M25	40 c		
	amples listed below were ion findings worksheets.	revie	ewed for ea	ch of the f	ollowing	val	lidation are	eas. \	/alidatic	n find	dings a	re noted in attache
	Validation A	Area							Comm	ents		
1.	Technical holding times			A	Sampling	g da	tes: S	5	09			
lla.	Initial calibration			N								
IIb.	Calibration verification			N								
111.	Blanks			Δ								
IV	Matrix Spike/Matrix Spike Du	plicate	es	2	3 0	1:.	- 4 Sp.	ni f	يد:			
V	Duplicates			7								
VI.	Laboratory control samples			A	LCS	: 1	LLSD					
VII.	Sample result verification			N								
VIII.	Overall assessment of data			A								
IX.	Field duplicates			7								
x	Field blanks			514	EB	- (	EB-1	(£	ra 2	. <del>\</del>	395	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	lo compound isate ield blank	s detected	i	TB =	uplica Trip bl Equip		k		
Valluato		اب							· · · · · · · · · · · · · · · · · · ·	<b>T</b>	<del></del>	W
1 !	M-5A	11		<u></u>	21	$\perp$				31	ļ	
2	PB	12			22					32		
3		13			23	4				33		
4		14			24	$\perp$				34		
5		15			25					35		
6		16			26					36		

19	29	39	
20	30	40	
			20 30 40

LDC#:21040?6 SDG#:270369

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_ Reviewer:\_\_\_\_\_\_2nd reviewer:\_\_\_\_\_\_\_\_

All circled methods are applicable to each sample.

	:	
Sample ID	Matrix	Parameter
\	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR6+ (C) 24
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph tds ci f no <sub>3</sub> no <sub>2</sub> so <sub>4</sub> po <sub>4</sub> alk cn <sup>-</sup> nh <sub>3</sub> tkn toc cr <sup>6+</sup>
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f no <sub>3</sub> no <sub>2</sub> so <sub>4</sub> po <sub>4</sub> alk cn <sup>-</sup> nh <sub>3</sub> tkn toc cr <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN. NH, TKN TOC CR6+

Comments:		W-17

LDC #: 21343 PC SDG #: 272363

# VALIDATION FINDINGS WORKSHEET Field Blanks

Page: \ of \ Reviewer: 🗚 🙏 2nd Reviewer:

METHOD: Inorganics, EPA Method\_

Were target analytes detected in the field blanks? Were field blanks identified in this SDG? N N/A

(coq: pe)

N N/A V Blank units:

Associated sample units:

Sample Identification Associated Samples: Field blank type: (circle one) Field Blank / Rinsate / Other) 39754 Soil factor applied Blank ID 159 EB-Sampling date: 5/5/09 Analyte 707

ssociated sample units:
Blank units:

Soil factor applied Sampling date:

Field blank type: (circle one) Field Blank / Rinsate / Other:

Associated Samples:

Sample Identification Blank ID Analyte

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270376

#### Sample Identification

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

#### Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
I-U	Total dissolved solids	15 days	7 days	J- (all detects) R (all non-detects)	P
I-G I-Q I-F I-N I-M I-R	Total dissolved solids	17 days	7 days	J- (all detects) R (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 (from SDG 270390) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	5/5/09	Perchlorate	159 ug/L	All samples in SDG 270376

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

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

#### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270376

SDG	Sample	Analyte	Flag	A or P	Reason
270376	I-U I-G I-Q I-F I-N I-M	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270376

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270376

No Sample Data Qualified in this SDG

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in att validation findings worksheets.    Validation Area	Date: → [ , [ o Page: _ , of _ Reviewer: I Reviewer:		evel 2A	Le		<del></del>	270376 tory: MWH Laboratories	SDG #: _aborat
Technical holding times   SW   Sampling dates: S   S   Sq	e noted in attached	validation areas. Validation findings a	llowing val	ch of the fo	wed for eac	reviev	mples listed below were on findings worksheets.	The sar
I.   Technical holding times   SW   Sampling dates:   S   S   S		Comments				rea	Validation /	
IIa.   Initial calibration		g dates: S   5   o 9	Sampling da	5W				
IIIb.   Calibration verification   N		,		N_				
III.   Blanks   A				N				
IV   Matrix Spike/Matrix Spike Duplicates   V   Duplicates   V   Duplicates   V   Laboratory control samples   A   Lcs   Lcs   C   Lcs   V   Lcs   L				A				
V Duplicates  VI. Laboratory control samples  A LCS (LCSD)  VII. Sample result verification  N VIII. Overall assessment of data  IX. Field duplicates  X Field blanks  ND = No compounds detected  N = Not provided/applicable  N = Not provided/applicable  SW = See worksheet  ND = No compounds detected  R = Rinsate  R = Rinsate  FB = Field blank  Validated Samples:		dint Specified	} C1:	N	s	plicate	Matrix Spike/Matrix Spike Du	
VII. Sample result verification  VIII. Overall assessment of data  IX. Field duplicates  X Field blanks  ND = No compounds detected N = Not provided/applicable SW = See worksheet  ND = No compounds detected R = Rinsate R = Rinsate FB = Field blank  Validated Samples:				12				V
VIII. Overall assessment of data  IX. Field duplicates  X Field blanks  Note: A = Acceptable N = Not provided/applicable SW = See worksheet  N = Not provided/applicable FB = Field blank  Validated Samples:  D = Duplicate TB = Trip blank EB = Equipment blank  Validated Samples:		16020	LUSI	A			Laboratory control samples	VI.
IX. Field duplicates  X Field blanks  Note: A = Acceptable				N			Sample result verification	VII.
Note: A = Acceptable N = Not provided/applicable SW = See worksheet  ND = No compounds detected R = Rinsate FB = Field blank  Validated Samples:  D = Duplicate TB = Trip blank EB = Equipment blank				_ A_			Overall assessment of data	VIII.
Note: A = Acceptable N = Not provided/applicable SW = See worksheet  ND = No compounds detected R = Rinsate FB = Field blank  Validated Samples:		1.^		2			Field duplicates	IX.
Note: A = Acceptable N = Not provided/applicable SW = See worksheet  Validated Samples:  TB = Trip blank EB = Equipment blank  Validated Samples:		= EB-1 (trm 27039	EB=	2 M	<u> </u>		Field hlanks	_x_
Au wet		TB = Trip blank	s detected	sate	R = Rir		N = Not provided/applicable	Note:
31					- <b>L</b>	ا		Validate
1   I-O   11   I-M ·		1 31	21		I-M ·			
2 I-P 12 I-D 22 32		2 32	22					
3 I-H 13 I-C 23 33		3 33	23		I-C			<del>-</del>
4 I-U · 14 I-S 24 34		4 34	24		I-S	14		

	<u> </u>					
1	1-0	11	I-M	21	31	
		12	I-D	22	 32	
2	I-P			23	33	
3	I-H	13	I-C	23	-	
4	I-U '	14	I-S	24	34	
			I-L.	25	35	
5	I-T	15				
6	I-G ·	16	I-R ·	26	36	
7	I-Q ·	17	I-B	27	37	
⊮—	I F-W			00	38	
8	I-F •	18	I-AR	28	155	
9	I-N *	19	PB	29	39	
		20		30	40	
10	I-E	120				

Notes:	

LDC#:<u>21040</u>06 SDG#:<u>22037</u>6

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_ Reviewer:\_\_A\_ 2nd reviewer:\_\_\_

All circled methods are applicable to each sample.

Sample ID	<u> Matrix</u>	Parameter Parameter
1-18	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR8+ (C1 34)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
,		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #:<u>21540</u>& SDG #:<u>2703</u>76

## VALIDATION FINDINGS WORKSHEET <u>Technical Holding Times</u>

Page:of
Reviewer: 🔬
2nd reviewer:

All circled dates have exceeded the technical holding time.

Y N N/A Were all samples preserved as applicable to each method?

Y)N N/A Were all cooler temperatures within validation criteria? Method: 160.1 SM2540C Parameters: 7D5 7 days Technical holding time: **Analysis Analysis** Analysis **Analysis Analysis** Sampling date Qualifier date date date date date Sample ID 4 5 5 09 J- R 17 (h) 6-9 11 16

LDC #. 21040 @ 6 SDG #: 27037C

# VALIDATION FINDINGS WORKSHEET

Field Blanks

Reviewer: A

Page: \ of \

Analyte Blank ID Sample Identification  C ( ) 4	Analyte Blank ID  C ( ) - ( ) - ( )	Sami	ple Identification	
	Dialify utilities. Associated sample utilities.			

	ation				
	Sample Identification				
Associated Samples:	S				
Associa					
ther:					
/ Rinsate / Of					
Field Blank	Blank ID				
Field blank type: (circle one) Field Blank / Rinsate / Ot	Analyte				

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 5, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270390

#### Sample Identification

I-AA

M-131

M-57A

M-79

M-69

M-135

M-25

M-99

M-37

MD-4

EB-1

M-135DUP

EB-1MS

EB-1MSD

#### Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-37 EB-1	Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	5/5/09	Perchlorate	159 ug/L	I-AA M-131 M-57A M-79 M-69 M-135 M-25 M-99 M-37

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

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples M-57A and MD-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration		DDD Difference		
Analyte	M-57A	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	3260 mg/L	3200 mg/L	2 (≤30)	•	-	-
Perchlorate	26200 ug/L	25200 ug/L	4 (≤30)	-	-	-

#### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270390

SDG	Sample	Analyte	Flag	A or P	Reason
270390	M-37 EB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270390

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270390

No Sample Data Qualified in this SDG

SDG i Labor <b>METH</b>	#:21040R6 #: _270390 atory: <u>MWH Laboratories</u> HOD: (Analyte) <u>Hexavented 160.1)</u> , Chlorate, Nitra	salent	Chromium	L (EPA SW	_evel 2 /846 Me	2A	7196), Perchlo		Date: ¬ ( , \ Page: _ , of _ , Reviewer:
	amples listed below were tion findings worksheets		ewed for ea	ch of the f	following	y valic	dation areas. Va	alidation find	lings are noted in attached
	Validation	Area					WARRANT	Comments	
l.	Technical holding times			SW	Samplir	ng date	s: 5   5	<b>09</b>	
IIa.	Initial calibration			N					
IIb.	Calibration verification			N					
111.	Blanks								
IV	Matrix Spike/Matrix Spike D	uplica	tes		3 1	15/	MSDID	<u> </u>	
٧	Duplicates						Ţ.		
VI.	Laboratory control samples			Δ	LC	<u> </u>	-C5D		
VII.	Sample result verification			N					
VIII.	Overall assessment of data			A					
IX.	Field duplicates			<u> </u>	9:3+10				
L <sub>X</sub>	Field blanks			కట	ĒΒ	- 11			
Note: /alidate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound sate eld blank	ls detecte	d	D = Duplicate TB = Trip blar EB = Equipm	nk	
1	I-AA	11	EB-1		2	1		31	
	M-131	12	M-135DUP		2:			32	
3	M-57A <b>D</b>	13	EB-1MS		2			33	
4	<b>M</b> -79	14	EB-1MSD		2.			34	
5	M-69	15	PB		2:			35	
2 3 4 5 6	M-135	16			20	3		36	
	M-25 ·	17			2.	7		37	
8	<b>M</b> -99	18			2	3		38	
l 1	M-37 ·	19			25	9		39	
	MD 4 D	20			1	T		140	

Notes:\_\_\_\_

LDC #: 21340R6 SDG #: 270390

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_\
Reviewer:\_\_A\_\
2nd reviewer:\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-6.8	$\omega$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C1 O <sub>4</sub>
10		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
7	W	pH TDS)CI F (NO3) NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ C104) (C103)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
q	$\mathcal{L}$	pH (TDS) CI F (NO3) NO2 SO4 PO4 ALK CN- NH3 TKN TOC (CR6+) (104) (C103)
·		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
1 (	$\Im$	PH (TD) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
12	رل	pH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
13-14	$\omega$	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 2 1043 RC SDG #: 270390

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: <u>\</u>	of <u>\</u> _
Reviewer:	2
2nd reviewer:	

All circled dates have exceeded the technical holding time.

7196 Method: Cr 6+ Parameters: 24 hrs Technical holding time: **Analysis** Sampling Analysis Analysis **Analysis Analysis** Sample ID date date date date Qualifier date date J-1UJ/P (L) 5/6/29 (31.5 h 9 1819 1042 5/6/09 (31.5 W 11 1819 1045

LDC #: 21040 FC SDG #: ~ 398

# VALIDATION FINDINGS WORKSHEET Field Blanks

Reviewer: 🐴 Page: of 2nd Reviewer:\_\_

(×01<)						
Au went #11 (>10x)	Sample Identification					
Associated Samples:	Sam					Associated Samples:
METHOD: Inorganics, EPA Method Constitution of the field blanks identified in this SDG?  Where field blanks identified in this SDG?  Where target analytes detected in the field blanks?  Where target analytes detected in the field blanks?  Where target analytes detected in the field blanks?  Associated sample units: Associated sample units: Associated sample of the field blank type: (circle one) Field Blank / Rinsate / Other: EB	Q					ted sample units:Soil factor applied
METHOD: Inorganics, EPA Method   Companies   Compani	Analyte Blank ID	159				Associate:
METHOD: Inc N N/A N N/A Blank units: Sampling dat Field blank ty	An					Blank units: Sampling date:

	cation							
Associated Samples:	Sample Identification							
eld Blank / Rinsate / Ot	Blank ID				-			
Field blank type: (circle one) Field Blank / Rinsate / Other:	Analyte	Allayer						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#	21040R6
SDG#:	See Cover

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: <u>      of                              </u>	_
Reviewer: A	
2nd Reviewer:	

Inorganics, Method See Cover

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(< 30)		
Analyte	3	10	(≤ 30) RPD	
TDS	3260	3200	2	
Perchlorate (ug/L)	26200	25200	4	

V:\FIELD DUPLICATES\FD\_inorganic\21040R6.wpd

#### Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270439

#### Sample Identification

M-92 M-97 M-74DUP M-12AMS M-12AMSD

M-33

M-31A

M-52

M-50

M-21

M-34

M-35

M-19

M-39

M-68

M-74

M-73

M-88

M-11

M-12A

M-13

MD-5

EB-2

#### Introduction

This data review covers 23 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-33 M-31A M-50 M-34 MD-5	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	Р
M-11	Hexavalent chromium	24.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
EB-2	Hexavalent chromium	27.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-2 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	5/6/09	Perchlorate	70 ug/L	M-92 M-97 M-33 M-31A M-52 M-50 M-21 M-35 M-19 M-39 M-68 M-74 M-73 M-73 M-88 M-11 M-12A M-13 M-13

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

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples M-34 and MD-5 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration				
Analyte	M-34	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	9200 mg/L	7350 mg/L	22 (≤30)	-	-	-
Perchlorate	1500000 ug/L	1580000 ug/L	5 (≤30)	-	-	-

### 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270439

SDG	Sample	Analyte	Flag	A or P	Reason
270439	M-33 M-31A M-50 M-34 MD-5	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times
270439	M-11 EB-2	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270439

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270439

No Sample Data Qualified in this SDG

SDG Labor <b>METI</b> Metho	od 160.1), Chlorate, Nitra	alent te-N	Chromium (EPA SW84	L (EPA SW) 6 Method	.eve 846 9056	Metho		lorate (EPA	Date: 2 1 1 2 Page: 1 of 1 Reviewer: 2 1 2nd Reviewer: 1 Method 314.0), TDS (EPA
	amples listed below were tion findings worksheets		ewed for ea	ch of the f	ollow	ving v	alidation areas. \	/alidation fir	ndings are noted in attached
<u> </u>	Validation	Area						Comment	
1.	Technical holding times			Sω	Sam	ipling d	ates: 5 ( 6	109	
IIa.	Initial calibration			N					
IIb.	Calibration verification			N					
111.	Blanks			Δ	<u> </u>				
IV	Matrix Spike/Matrix Spike Duplicates			A	12	MS	IM 5D	Dap	
V	Duplicates			A					
VI.	Laboratory control samples			А	L	<u>LS</u>	( 650		
VII.	Sample result verification			N					
VIII.	Overall assessment of data			Δ.					
IX.	Field duplicates			50	1	7 - 8	+19		
L <sub>X</sub>	Field blanks			<u> </u>	Ε	<u>- a.</u>	20		
Note: √alidat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	e 4 A	R = Rin	o compound sate eld blank	s dete	ected	D = Duplicat TB = Trip bl EB = Equipr	ank	
1	M-92	11	M-39 ·			21	M-74DUP	31	
2	M-97	12	M-68			22	M-12AMS	32	
3	M-33	13	M-74			23	M-12AMSD	33	
4	M-31A	14	M-73			24	DR	34	
5	M-52	15	M-88			25		35	
6	M-50	16	M-11 ·			26		36	
7	M-21	17	M-12A ·			27		37	
8	M-34	18	M-13	¥		28		38	
9	M-35	19	MD-5			29		39	
ا ۱	NA 40	20	ED 3			20		40	

Notes:\_\_\_

LDC #: <u>21043</u>5 6 SDG #: <u>27043</u>9

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_of\_\_ Reviewer:\_\_\_\_\_ 2nd reviewer:\_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-10,	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CL 24)
12-15		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
19		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
11,18	w	pH (TDS) CI F (NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ C124 C125
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
16-17	_ب	pH (TDS) CI F (NO) NO, SO, PO, ALK CN NH, TKN TOC (CR) (LO)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
20	لب	pH (DS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC (CR <sup>6+</sup> ) (Lo)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
21	س	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
22-23	س	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR )
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:	

LDC #: 2104056 SDG#: 270439

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: \\_of\_\\_ Reviewer: A 2nd reviewer:

All circled dates have exceeded the technical holding time.

N N/A

Were all cooler temperatures within validation criteria?

Y N N/A Were all coole	r temperatures v	within validation	criteria?				<del></del>	1
Method:		160.1/54	25400	7196				
Parameters:		T D5		Cr 64				
Technical holding time:		7 days		24 hrs				
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
3-4 6 8 19	5/6/09	5/22/39		(16 days	)		J-181P	(
16	5/6/09			5/7/09	(24.	5 hrs)	9/EN -E	
	1134			1204				
20	5/6/09			5/7/09	(27.5	hi)	<u> </u>	
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LDC #: 2 104056 SDG #: 270 434

# **VALIDATION FINDINGS WORKSHEET**

Field Blanks

2nd Reviewer:\_ Reviewer:

Page: of

(ò,x)							
د) دع							
# +							
Ace way \$ #20 (>10x)	Sample Identification						
	Sample						
Associated Samples:							
Associ							
blanks? — F. <i>乞</i> 居							
EPA Method Service (2007) ield blanks identified in this SDG? arget analytes detected in the field kesociated sample units: 1/2 Soil factor applied le one) Field Blank / Rinsate / Other							
ntified in the detected is ample un factor applemant / Rins	<u> </u>						
Method_ blanks ide t analytes <b>ociated s</b> <b>ociated s</b> ≥ Soil	Blank ID	22	4	)			
were f Were f Were t Were t Were t Were t	Analyte						
METHOD: I N N/A N N/A Blank units Sampling c							

			nc					
			Sample Identification					
		Associated Samples:	Sam					
		Associate				200 (100 miles) (1		
-		)r:						
units:	applied	Rinsate / Othe						
Associated sample units:	Soil factor a	Field Blank / F	Blank ID					
Associ		(circle one)						
Blank units:	Sampling date:	Field blank type: (circle one) Field Blank / Rinsate / Other.	Analyte					

Associated sample units:

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

3

LDC# <u>210</u> SDG#: <u>See</u>	<del>/ 1000</del>	VALIDATION FINDINGS WORKSHEET Field Duplicates	Page:of_ Reviewer:A_ 2nd Reviewer:
Inorganics,	Method See Cover		
() N NA (Y)N NA	Were field duplicate Were target analyte	pairs identified in this SDG? s detected in the field duplicate pairs?	

	Concentrat	tion (mg/L)	(≤ 30)	
Analyte	8	19	RPD	
TDS	9200	7350	22	
Perchlorate (ug/L)	1500000	1580000	5	

V:\FIELD DUPLICATES\FD\_inorganic\21040S6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 6, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270442

Sample Identification

I-K

I-J

1-1

I-Z

I-V

#### Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
I-I I-V	Total dissolved solids	16 days	7 days	J- (all detects) R (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-2 (from SDG 270439) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	5/6/09	Perchlorate	70 ug/L	All samples in SDG 270442

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

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270442

SDG	Sample	Analyte	Flag	A or P	Reason
270442	I-I I-V	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270442

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270442

No Sample Data Qualified in this SDG

SDG Labo	#: <u>21040T6</u> #: <u>270442</u> ratory: <u>MWH Laboratorie</u> :	S		L	_eve	I 2A		RKSHEET		Date: 7 (2 ) 2  Page: 1 of 1  Reviewer: 4  2nd Reviewer: 4
MET	HOD: (Analyte) Perchlo	rate (	EPA Metho	d 314.0), <sup>-</sup>	TDS	(EPA	Method 16	0.1 < M 25	400	
	samples listed below were ation findings worksheets		ewed for ea	ch of the f	ollow	ing v	alidation are	eas. Validatio	n find	ings are noted in attached
	Validation	Area						Comm	ents	
I.	Technical holding times			<u></u> ಶು	Sam	pling d	lates: 5	6/09		
IIa.	Initial calibration			N			·			
lib.	Calibration verification			N						
111.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike D	uplicat	es	4	7.	fra	27033	٩		
V	Duplicates			A			······································	······································		
VI.	Laboratory control samples			A	L	-5	6620			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			7						
Lx	Field blanks			5W	E	B =	EB-2	(frm:	270	439)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<b>;</b>	R = Rin	o compound: sate eld blank	s dete	cted	TB = 1	uplicate Frip blank Equipment blan	k	
Valida	ted Samples:	<u></u>	wet							
1	I-K	11			<del></del>	21			31	
2	I-J	12				22			32	
	I-I ·	13				23			33	
4	I-Z	14		,		24			34	
5	I-V ·	15				25			35	
6	PB	16				26			36	
7		17				27			37	
8		18				28			38	

Notes:

 LDC #: 2104076 SDG #: 270442

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	of
Reviewer:	Al
2nd reviewer:	

All circled methods are applicable to each sample.

G		
Sample ID	Matrix	Parameter
1-5	$\omega$	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR6+ (C134)
		pH TDS CI F NO₃ NO₂ SO₄ PO₄ ALK CN⁻ NH₃ TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments	·			

LDC #: 21040T6 SDG#: 270442

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

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All circled dates have exceeded the technical holding time.

(Y)N N/A

Were all samples preserved as applicable to each method?

(Y)N N/A

Were all cooler temperatures within validation criteria?

Y )N N/A Were all cod	ner temperatures	Within Validation	r criteria?	entered for extent 1			1	1
Method:		160.1 JA	125400					
Parameters:		TDS						
Technical holding 1	ime:	7 days						
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
3,5	5/6/09	5/22/09		(16 days	)		J-/R P	(4
				,				
					·. ·			
				:				
					<u> </u>	na 7		
3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3								
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LDC #: 2,04074 SDG #: 270 442

**VALIDATION FINDINGS WORKSHEET** 

Field Blanks

Page: \ of \ Reviewer: 2nd Reviewer:

ARR (>13x)	Sample Identification					
Associated Samples: ARR (>, ) x >	Sample					
were field blanks identified in this SDG? Were target analytes detected in the field blanks?     Associated sample units:         S   L         S   C         S   C         S   C         S   C         S   C         S   C         S   C						
ethod nuks identification in alytes de ciated san Soil fac	Blank ID	E8-2	いた			
METHOD: Inorganics, EPA Method  Normalization N/A  Were field blanks identified in this SDG?  Normalization N/A  Were target analytes detected in the field blanks?  Blank units: // Associated sample units: // Associated sample units: // Sampling date: s / (/o <sup>3</sup> Soil factor applied / Field blank type: (circle one) Field Blank / Rinsate / Other: Associated sample of the field blank type: (circle one) Field Blank / Rinsate	Analyte		r()2			

ampling date: Soil	: (circle one) Fi	Analyte Blank ID				
Soil factor applied	lank / Rinsate / Other:	QI				
	Associated Samples:	Sa				
		Sample Identification				

Associated sample units:

Blank units:\_\_\_\_\_Sampling date:\_

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 6, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270507

Sample Identification

PC-77

PC-74

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-2 (from SDG 270439) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	5/6/09	Perchiorate	70 ug/L	All samples in SDG 270507

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

# IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

# VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 270507

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270507

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270507

No Sample Data Qualified in this SDG

SDG # Labora	t:21040U6 #: 270507 atory: MWH Laboratories	<u> </u>		L	evel 2A	ESS WORK		Date: + ( 2 ).  Page: _ of  Reviewer: A 2  2nd Reviewer:
	IOD: (Analyte) Perchlo							
	amples listed below were tion findings worksheets.		ved for ea	ch of the fo	ollowing v	alidation area	s. Validation fin	dings are noted in attached
	Validation	Area					Comments	
l.	Technical holding times			Α_	Sampling of	lates: 5 / 6	109	
lla.	Initial calibration			N			······································	
IIb.	Calibration verification			N				
III.	Blanks			A				
IV	Matrix Spike/Matrix Spike D	uplicates	3	1	} fn	2704	39	
V	Duplicates			A	1			
VI.	Laboratory control samples			A	LLS	LLSD		
VII.	Sample result verification			N				
VIII.	Overall assessment of data			A				
IX.	Field duplicates			7				
_ x_	Field blanks			<u> 5 W</u>	EB.	EB-2 (	from 2706	139)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	s detected	D = Dup TB = Tri EB = Eq		
Validate	ed Samples:	i						
1	DC 27	111	~		21		31	
	PC-77 PC-74	11			22		32	
3	PB	13			23		33	
	1 D	14			24		34	
4		1			05		25	

1_	PC-77	11		21		31	
2	PC-74	12		22		32	
3	PB	13		23		33	
4		14		24		34	
5		15	2	25		35	
6		16	2	26		36	
7		17	2	27	4-5	37	
8		18	2	28		38	
9		19		29		39	
40		20		30		<b>4</b> 0	

Notes:	

LDC #: <u>210400</u>6 SDG #: <u>270507</u>

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:	of
Reviewer:	_1
2nd reviewer:	

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-2	$\omega$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 O <sub>4</sub> )
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH_TDS_CLF_NO <sub>2</sub> _NO <sub>2</sub> _SO_PO_ALK_CN <sup>2</sup> _NH <sub>2</sub> _TKN_TOC_CR <sup>6+</sup>

Comments:	

LDC #: 210400 C SDG #: 27 0 507

# **VALIDATION FINDINGS WORKSHEET** Field Blanks

2nd Reviewer: 1 Reviewer: AL

Page: \ of \

Associated Samples: A 60 (>100)	tion						
	Sample Identification						
afed Samples	Š						
Associat							
? ild blanks? 7_— her. *_ &_							
were field blanks identified in this SDG? Were target analytes detected in the field blanks?  ✓ Associated sample units: ✓ / ✓ ✓ Soil factor applied  ✓ ( ✓ △ △ ○ Soil factor applied  ✓ ( ✓ ← ← ← ← ← ← ← ← ← ← ← ← ← ← ← ← ←							
yanics, EPA Method  Were field blanks identified in this SDG  Were target analytes detected in the field  Associated sample units:  Soli factor applied  Gircle one) Field Blank / Rinsafe / Official and State / Official	Blank ID	EB-2	4				
yere field bl. Were target is the standard of the standard is the standard in	yte		<b>ד</b>	•			
METHOD: Inorganics, EPA Method S. C. C. Were field blanks identified in this SDG?  (Y) N N/A Were target analytes detected in the field blanks?  Blank units: Associated sample units: 1/6 / 0 A Soil factor applied  Sampling date: 5 / 6 / 0 A Soil factor applied  Field blank type: (circle one) Field Blank / Rinsate /Other) A Response of the circle one)	Analyte		6104				
<b>≅</b> ⟨J Z a ÿ ii	لـــا			<u> </u>			

Associated sample units: Blank units:

Sampling date: Soil factor applied Field blank type: (circle one) Field Blank / Rinsate / Other

Associated Samples:

tion					
Sample Identification					
Ö					
		,			1
Blank ID					
Analyte					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 7, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270564

Sample Identification

HMW9

PC-96

PC-112

PC-110

PC-107

PC-112DUP

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PC-112	Perchlorate	32 days	28 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270564

SDG	Sample	Analyte	Flag	A or P	Reason
270564	PC-112	Perchlorate	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270564

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270564

No Sample Data Qualified in this SDG

SDG 7	t: <u>21040V6</u> #: <u>270564</u> atory: <u>MWH Laboratorie</u>		DATIO		PLETE ₋evel 2		SS WORKSHEET	Date: ع ا ي ا Page: ر of ر Reviewer: عام 2nd Reviewer:
METH	IOD: (Analyte) Perchic	orate (EP	A Metho	d 314.0), <sup>-</sup>	TDS (EF	PA N	lethod 160.1 コルンケー	104)
	amples listed below were tion findings worksheets		ed for ea	ch of the f	ollowing	vali	dation areas. Validation	findings are noted in attache
	Validation	Area					Commer	nts
1.	Technical holding times			3ಎ	Samplin	g date		
lla.	Initial calibration			N				
IIb.	Calibration verification			N				
III.	Blanks			A				
IV	Matrix Spike/Matrix Spike D	uplicates		~	7	no	•	
V	Duplicates			A				
VI.	Laboratory control samples				Les	10	- C 5 7	
VII.	Sample result verification		. " - " - " - " - " - " - " - " - " - "	N		`		
VIII.	Overall assessment of data			A				***************************************
IX.	Field duplicates			2			**************************************	
<u> </u>	Field blanks			7				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	Э	R = Rin	o compound sate eld blank	s detected	Ė	D = Duplicate TB = Trip blank EB = Equipment blank	
√alidate	ed Samples:	weh						
1	HMW9	11			21		3.	1
	PC-96	12			22		33	2
	PC-112	13			23		33	
	PC-110	14			24		34	4
	PC-107	15			25		38	5
6	PC-112DUP	16			26		36	6
7	PB	17			27		37	7
8		18			28		38	3
9		19			29		39	9
10		20			30		40	)
Votes								

LDC #: 220564

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
(-5	(L)	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Cl O <sub>4</sub> )
, ,		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
( <sub>4</sub>	لب	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 21040V6 SDG#: 270564

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>\</u> of <u>\</u>
Reviewer:_	21
2nd reviewer:	1~

All circled dates have exceeded the technical holding time.

YN N/A

Were all samples preserved as applicable to each method?

N N/A

Were all cooler temperatures within validation criteria?

Y) N N/A Were all coo	ner temperatures		citteria?		I		T l	
Method:		314.0		<u> </u>				
Parameters:		C104						
Technical holding t	time:	28 days						
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
3	5/7/09	6 8 09		(32 day	3		J-   UJ   P	(h`
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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 8, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270578

# Sample Identification

PC-94

PC-93

PC-2

HSW-1

HM-2

PC-104

HMW14

PC-2MS

PC-2MSD

#### Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

## V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270578

No Sample Data Qualified in this SDG

LDC #: 21040W6 VALIDATION COMPLETENESS W SDG #: 270578 Level 2A Laboratory: MWH Laboratories  METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 1										Nitra	Date: ユ ( ュ ) Page: _ of _ \ Reviewer: _ Δ \ 2nd Reviewer: _ \ wate-N (EPA SW846 Method
9056)								~	54007		
	amples listed below were tion findings worksheets.		ewed for ead	ch of the f	following	g va	idation a	reas.	Validatior	n finc	dings are noted in attached
	Validation	Area							Comme	ents	
I.	Technical holding times			A	Samplii	ng da	tes: 5	8	109		
lla.	Initial calibration			N				•			
IIb.	Calibration verification			N							
111.	Blanks			A							
IV	Matrix Spike/Matrix Spike Du	uplicat	es	A	ζ,	M :	5/m	Ö			
V	Duplicates			7							
VI.	Laboratory control samples			A	رر ع	s ( .	LUSD				
VII.	Sample result verification			N		•					
VIII.	Overall assessment of data			А							
IX.	Field duplicates			7							
L	Field blanks			7							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	ds detecte	ed	TB	Duplica = Trip b = Equip		:	
Validat	ed Samples:	~	~ <del>\</del>								
1	PC-94	11			2	21				31	
2	PC-93	12			2	22				32	
3	PC-2	13			2	23			_	33	
4	HSW-1	14			2	24				34	
5	HM-2	15			2	25				35	
6	PC-104	16			2	26				36	
7	H JMW14	17			2	27			. W.E.W.	37	
8	PC-2MS	18			2	28				38	
9	PC-2MSD	19			2	29				39	
10	PB	20			3	30				40	

Notes:\_\_\_\_\_

LDC#:<u>210466</u>66 SDG#:<u>27057</u>8

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_ Reviewer:\_\_\_\_ 2nd reviewer:\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix_	Parameter
1,4-7	<u>w</u>	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR C C C
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2-3	<u> </u>	pH (DS) CI F (NO3) NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ (C124) (C123)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
8-9	W	pH TDS CI F (NO3) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
<u> </u>		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		OH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		DH TDS CLE NO. NO. SO, PO, ALK CN NH, TKN TOC CR6+

METHODS.6

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 8, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270579

Sample Identification

M-17A

M-2A

M-76

M-75

M-115

M-14A

M-14ADUP

#### Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-2A	Total dissolved solids	14 days	7 days	J- (all detects) UJ (all non-detects)	А

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270579

SDG	Sample	Analyte	Flag	A or P	Reason
270579	M-2A	Total dissolved solids	J- (all detects) UJ (all non-detects)	A	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270579

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270579

No Sample Data Qualified in this SDG

SDG i Labor	t:21040X6 #:_270579 atory:_MWH Laboratories	<u> </u>		L	evel 2	Α	s Work			Date: 7 2 ( Page: 1 of 1 Reviewer: 2nd Reviewer: 1
	IOD: (Analyte) Perchlo								<del></del>	
The s valida	amples listed below were tion findings worksheets.	revie	ewed for ead	ch of the fo	ollowing	yalic	lation areas	. Validation t	inai	ngs are noted in attached
	Validation	Area						Commen	ts	
ı.	Technical holding times			sω	Samplin	g date	s: 5   8	109		
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
III.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike D	uplicate	es	N	7 5	وبما				
V	Duplicates			Α						
VI.	Laboratory control samples			Δ	LLS	12	C 5 5			
VII.	Sample result verification			N		•				
VIII.	Overall assessment of data			Δ_						
IX.	Field duplicates			2						
_x_	Field blanks			N						
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	<b>)</b>	R = Rin	o compound sate eld blank	is detecte	d	D = Dupli TB = Trip EB = Equ			
	<u> </u>	<u></u>	<u> </u>			T				
1	M-17A	11			2			31		
2	M-2A ·	12			2:			32	$\neg$	
3	M-76	13			2			33		
4	M-75	14			2			34		
5	M-115	15			2:			35		
6	M-14A	16			2			36		
7	M-14ADUP	17			2			37		
8	PB	18			2	8		38	3	

Notes:	

 LDC#: 21040x6 SDG#: 270579

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-6	$\omega$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C 1 O <sub>4</sub>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
LC 7	$\mathcal{L}$	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN-NH3 TKN TOC CR6+
	,	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:	 			 	 
		 	,	 	 

LDC #: 21040x6 SDG #: 270579

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_ <u>(_</u> (	of <u> </u>
Reviewer: 🔀	2_
2nd reviewer:	1

All circled dates have exceeded the technical holding time.

YN N/A

Were all samples preserved as applicable to each method?

YN N/A

Were all cooler temperatures within validation criteria?

Y N N/A vvere all cook								
Method:		1	125426					
Parameters:		TDS						
Technical holding time:		7 days	7 days					
Sampling Sampling		Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
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# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 11, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270639

Sample Identification

PC-108

**HMW-15** 

**HMW-13** 

PC-79

PC-79MS

PC-79MSD

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

#### V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270639

No Sample Data Qualified in this SDG

SDG Labo	#: <u>21040Y6</u> #: <u>270639</u> ratory: <u>MWH Laboratorie</u>	<u>s</u>		l	_evel 2A				Date: ¬   ²  .  Page: _ of _  Reviewer: _ △ /  2nd Reviewer:
METI	HOD: (Analyte) Perchlo	orate (EPA	Metho	d 314.0),	TDS (EP	A Method 16	50.1	SM&540C	_
The s	amples listed below were ation findings worksheets	e reviewed	for eac	ch of the f	following v	alidation are	eas. \	Validation findin	 gs are noted in attached
	Validation	Area	·					Comments	
I.	Technical holding times			A	Sampling	dates: 5	11	109	
lla.	Initial calibration			N		ì			
IIb.	Calibration verification			N					
111.	Blanks			A					
IV	Matrix Spike/Matrix Spike D	)uplicates		Δ.	7 1	s/msi	<u> </u>		
V	Duplicates			7					
VI.	Laboratory control samples			A	LLS	ILLED			
VII.	Sample result verification			N					
VIII.	Overall assessment of data			A					
IX.	Field duplicates			2					
X	Field blanks			2					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	Э	R = Rins	compound sate eld blank	ls detected	TB = 1	uplica Trip bl Equip		
Validat	ed Samples:	ا سمع ا							
1	PC-108	11	<u> </u>		21			31	
2	HMW-15	12			22			32	
3	HMW-13	13			23			33	
4	PC-79	14	*********		24			34	
5	PC-79MS	15			25			35	······································
6	PC-79MSD	16			26			36	
7	PB	17			27			37	
8		18			28			38	
9		19			29			39	
10		20			30			40	
Votes					<u> </u>				

LDC#: 2104546 SDG#: 270639

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_of\_\_ Reviewer:\_\_\_\_2nd reviewer:\_\_\_\_

All circled methods are applicable to each sample.

	-
Sample ID Matrix Parameter	
1-4 W pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C124)	
pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>	
ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C104	
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pH TDS CLF NO, NO, SO, PO, ALK CN' NH, TKN TOC CR6+	

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 12, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270708

Sample Identification

HMW16

PC-24

PC-50

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
HMW16 PC-24 PC-50	Total dissolved solids	8 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

#### V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270708

SDG	Sample	Analyte	Flag	A or P	Reason
270708	HMW16 PC-24 PC-50	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270708

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270708

No Sample Data Qualified in this SDG

# LDC #: 21040Z6 VALIDATION COMPLETENESS WORKSHEET

Level 2A

Date: ٦/٢/٥٩
Page: \_of_\_
Reviewer:
2nd Reviewer: 1

SDG #: 270708 Laboratory: MWH Laboratories

METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) sm 254 oc)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	ടധ	Sampling dates: 5 / 12 / 39
lla.	Initial calibration	N	
llb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	} from 270639
V	Duplicates	N	
VI.	Laboratory control samples	<u> </u>	LLS LLSD
VII.	Sample result verification	N	'
VIII.	Overall assessment of data	A	
IX.	Field duplicates	7	
х	Field blanks	7	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

TB = Trip blank
EB = Equipment blank

Validated Samples:

	ated Samples.	Au ust			
1	HMW16	11	21	31	
2	PC-24	12	22	32	
3	PC-50	13	23	33	
4	PB	14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:			
_			

LDC #: 2104026 SDG #: 270708

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_ Reviewer:\_\_\_\_\_ 2nd reviewer:\_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-3	$\omega$	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ (C) 34
1 3	$\sim$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC#: 2104026 SDG#: 270708

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

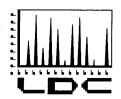
Page:_	1	_of_	١
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All circled dates have exceeded the technical holding time.

(YN N/A) Were all samples preserved as applicable to each method?

N N/A Were all cooler temperatures within validation criteria?

Method:		160.1 51	125400				·
Parameters:		TD5'					
Technical holding t	ime:	7 d~15					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
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#### LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Tronox, LLC P.O. Box 55

August 5, 2009

Henderson NV 89009 ATTN: Ms. Susan Crowley

SUBJECT: 2009 Annual Remedial Performance Sampling, Data Validation

Dear Ms. Crowley,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 19, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### **LDC Project # 21041:**

#### SDG#

#### **Fraction**

270815, 270857, 271048, 271121, 271325, 270531, 270704, 270794, 270845, 270989, 270992, 271160, 271248, 271400, 271465, 271624, 270567, 271337, 271731, 270628, 271066, 271687, 271791, 271832, 271854, 271999, 272056, 272306

Chromium, Wet Chemistry

The data validation was performed under Stage 2A & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance, May 2006
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto

**Operations Manager/Senior Chemist** 

Attachment 1

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# 2009 Annual Remedial Performance Sampling Data Validation Reports LDC# 21041

Chromium



# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 13, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270815

Sample Identification

PC-65

PC-66

PC-67

PC-28

PC-31

PC-40

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

SDG#	:21041A4 :: 270815 atory:_MWH Laboratories		LIDATION		PLETE _evel 2		SS WORKSI	HEET	Date: 3 (9).  Page: 1 of 1  Reviewer: 4  2nd Reviewer: 4
ИЕТН	OD: Chromium (EPA SV	V 846	Method 60	10B)					
	amples listed below were ion findings worksheets.	revie	wed for eac	h of the f	followin	ıg va	lidation areas. V	/alidation find	dings are noted in attached
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	Validation	Area						Comments	
l.	Technical holding times			Α	Sampli	ing da	tes: 5 13	09	
11.	Calibration			N					
111.	Blanks			A				·	
IV.	ICP Interference Check Sam	ple (IC	S) Analysis	N	1				
V.	Matrix Spike Analysis			<u> </u>	<del>  {                                   </del>	<u> </u>	+ 2 p-c: f	: 2	
VI.	Duplicate Sample Analysis			<u> </u>					
VII.	Laboratory Control Samples	(LCS)		<u>^</u>	رد	5			
VIII.	Internal Standard (ICP-MS)	N	10.	+	Ut:1:22d				
IX.	Furnace Atomic Absorption	QC		7	1				
X.	ICP Serial Dilution			N	10	0 +	reviewed	for hun	2 A
XI.	Sample Result Verification			N	-			V	
XII.	Overall Assessment of Data			Δ					
XIII.	Field Duplicates			7					
XIV.	Field Blanks			2					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	•	R = Rins	o compound sate eld blank	ds detect	ted	D = Duplicat TB = Trip bl: EB = Equipr	ank	
randak	Au	<u>، ب</u>	+					<del></del>	T T
1	PC-65	11				21		31	
2	PC-66	12			;	22		32	
3	PC-67	13				23		33	
4	PC-28	14				24	***	34	
5	PC-31	15			:	25		35	
6	PC-40	16				26		36	
7	MB	17			:	27		37	
8		18				28		38	
9		19			:	29		39	

Notes:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 20, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271048

# Sample Identification

PC-64

FB052009

EB052009

M-65

M-134

**DUPLICATE** 

FB052009MS

FB052009MSD

#### Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB052009 was identified as an equipment blank. No chromium was found in this blank.

Sample FB052009 was identified as a field blank. No chromium was found in this blank.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

Samples M-134 and DUPLICATE were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (mg/L)					
Analyte	M-134	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	omium 0.10		18 (≤30)	-	-	-	

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271048

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271048

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271048

No Sample Data Qualified in this SDG

DG#	: 21041C4 t: 271048 atory: <u>MWH Laboratories</u>		LIDATION		LETE evel 2		SS WORKS	HEET	Pate: 7 9 Page: 10f			
ΛΕΤΗ	OD: Chromium (EPA SV	V 846	Method 60	10B)					2101000000			
	amples listed below were tion findings worksheets.	revie	wed for ead	ch of the fo	ollowing	g val	idation areas. \	Validation findi	ngs are noted in attached			
	Validation	Area						Comments				
I.	Technical holding times			Δ	Sampli	ng da	es: 5 2	09				
II.	Calibration			N								
III.	Blanks			A								
IV.	ICP Interference Check Sam	nple (IC	S) Analysis	N	<u> </u>							
V.	Matrix Spike Analysis						IMSD					
VI.	Duplicate Sample Analysis		N									
VII.	Laboratory Control Samples	Laboratory Control Samples (LCS)					· · · · · · · · · · · · · · · · · · ·					
VIII.	Internal Standard (ICP-MS)			N	\\ \rac{1}{2}	<b>t</b> c	(Atilizan	<u> </u>				
IX.	Furnace Atomic Absorption	QC		N	1		L					
X.	ICP Serial Dilution			N	Not uniems of Lul 24							
Xi.	Sample Result Verification			N				U				
XII.	Overall Assessment of Data	1		A								
XIII.	Field Duplicates			5W	D: 5+ 6							
XIV.	Field Blanks			ND	FB	: 2	EB:3	\$				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<del>)</del>	R = Rin	o compound isate ield blank	ds detect	ted	D = Duplica TB = Trip b EB = Equip					
Validat	ed Samples:	<u>، ب</u>	vet-									
1	PC-64	11				21		31				
2	FB052009	12				22		32				
3	EB052009	13				23		33				
4	M-65	14				24		34				
5	M-134 <sup>9</sup>	15				25		35				
6	DUPLICATE 5	16				26		36				
7	FB052009MS	17				27		37				

FB052009MSD

Notes:\_

 LDC#: 21041C4 SDG#: See Cover

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: 1 of 1

Reviewer: 2nd Reviewer:

METHOD: Metals (EPA Method 6010B)

NN NA

Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	(< 20)	
Compound	5	6	(≤ 30) RPD	
Chromium	0.10	0.12	18	

V:\FIELD DUPLICATES\FD\_inorganic\21041C4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 21, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271121

# Sample Identification

M-64

M-136

MW-16

FB052109

EB052109

MW-132

MW-133

M-126

M-127

DUPLICATE

#### Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB052109 was identified as an equipment blank. No chromium was found in this blank.

Sample FB052109 was identified as a field blank. No chromium was found in this blank.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples MW-132 and DUPLICATE were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentration (mg/L)						
Analyte	MW-132	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	0.081	0.094	15 (≤30)	-	-	-	

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

SDG #: Labora	271121 tory: MWH Laboratories	L	LETENESS WORKSHEET  evel 2A  Page:of  Reviewer:  2nd Reviewer:
The sa	OD: Chromium (EPA SW 846 Method 60 mples listed below were reviewed for each on findings worksheets.		ollowing validation areas. Validation findings are noted in attached
	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 5 21 39
11.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	Δ	fra 271348
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A_	LLS
VIII.	Internal Standard (ICP-MS)	N	N.+ Ut:1:2-d
IX.	Furnace Atomic Absorption QC	1	l
X.	ICP Serial Dilution	N	Not variant for Luce 24
XI.	Sample Result Verification	N	U
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	5 <b>U</b>	D: 6+10
XIV.	Field Blanks	75	FB: 4 EB: 5
Note:	N = Not provided/applicable R = Rin	o compound sate eld blank	s detected D = Duplicate TB = Trip blank EB = Equipment blank
Validate	od Samples:		

		AU wit		<del></del>	
1	M-64	11 MB	21	31	
2	M-136	12	22	32	
3	MW-16	13	23	33	
4	FB052109	14	24	34	
5	EB052109	15	25	35	
6	MW-132 D	16	26	36	
7	MVV-133	17	27	37	
8	M-126	18	28	38	
9	M-127	19	29	39	
10	DUPLICATE 5	20	30	40	

Notes:	

### LDC#: 21041D4 SDG#: See Cover

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: 1 of 1
Reviewer: 1
2nd Reviewer: 1

METHOD: Metals (EPA Method 6010B)

(ŶN NA (Y)N NA Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	( - 00)	
Compound	6	10	(≤ 30) RPD	
Chromium	0.081	0.094	15	

V:\FIELD DUPLICATES\FD\_inorganic\21041D4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 7, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270531

Sample Identification

M-10

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- Partial Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

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

# VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270531

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270531

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270531

No Sample Data Qualified in this SDG

SDG#	t:21041F4 #:_270531 atory:_MWH_Laboratories		LIDATION		PLETE _evel 2		SS WOR	KSHEET		Page: 1 of 1 Reviewer: 2nd Reviewer:
NETH	IOD: Chromium (EPA SV	V 846	Method 60	10B)						ZHU NOVICWOL.
Γhe sa /alida	amples listed below were tion findings worksheets.	revie	wed for eac	ch of the f	following	g va	lidation area	as. Validation f	inding	gs are noted in attached
	Validation	Area						Commen	ts	
l.	Technical holding times			Α	Samplir	ng da	ites: 5	+ 1 37		
II.	Calibration			N						
111.	Blanks			A						
IV.	ICP Interference Check Sam	nple (IC	S) Analysis	N						
V.	Matrix Spike Analysis			$\sim$	1 C	<u>را:</u>	A 57~	J. CA	,	
VI.	Duplicate Sample Analysis		7							
VII.	Laboratory Control Samples	A	Les							
VIII.	Internal Standard (ICP-MS)			N	Not Utilized					
IX.	Furnace Atomic Absorption	QC		7	\ \					
X.	ICP Serial Dilution			N	Not various for head 2A					
XI.	Sample Result Verification			N				0		
XII.	Overall Assessment of Data			Δ						
XIII.	Field Duplicates			4					·····	
XIV.	Field Blanks			<u> </u>						
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound sate eld blank	ds detecte	ed		plicate rip blank quipment blank		
1	M-10	11				21		31		
2	MB	12				22		32		
3	MIS	13				23		33	3	
4		14				24		34	ļ	
5		15			2	25		35	5	
6		16			2	26		36	3	
7		17			2	27		37	,	
8		18				28		38	, [	

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Notes:\_

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 12, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270704

## Sample Identification

PC-91

PC-86

PC-90

PC-103

MW-K5

PC-56

PC-68

I C-00

PC-60

PC-58

PC-62

PC-59

PC-98R

MW-K4

ARP-7

M-87

PC-97

ARP-6B

ARP-5A

ARP-4A

PC-53

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

# XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

# XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

SDG ;	t:21041G4 #:_270704 atory:_MWH Laboratories		LIDATIOI -		LETE Level :		ESS WOR	KSHEET		Date: ৄৄৄৄৄৄৄৄৄৢৄৢৄৄৄৄৢৄৢৄৄৄৢ Page: _ of _ ı Reviewer: _ <u>᠘</u> 2nd Reviewer: ↓
ИЕТН	IOD: Chromium (EPA S)	N 84	6 Method 60	)10B)						Zilu Reviewei.
The s	amples listed below were	e revi	ewed for eac	ch of the fo	ollowin	na va	alidation are	as. Validati	on find	dings are noted in attached
	tion findings worksheets					Ū				·
	Validation	Aras						Comn	nents	
	Technical holding times	AILE		A	Sampli	ina d	ates: 5	2 0		
<u> </u>	Calibration			N	Joanne	ing a	4100.	2 1 0	\	
 []],	Blanks			A						
IV.	ICP Interference Check Sar	nnle (l	CS) Analysis	N	†					
V.		iipie (i	OO) Allalysis	ار. ري	17 0	` 儿:	-+ 3 pm	S. A		
VI.		Matrix Spike Analysis			15		- V - V			
VII.				<u> </u>	66	-				
VIII.				N N	Not Utilized					
IX.	Furnace Atomic Absorption	OC.		2	l l					
X.	ICP Serial Dilution	<u>uo</u>		N	Not raised for Land LA					
XI.	Sample Result Verification			N	1 .		, , , , , , , , , , , , , , , , , , ,	$\overline{v}$		
XII.	Overall Assessment of Data	1		<u> </u>						
XIII.	Field Duplicates			<u> </u>						
XIV.		***		2						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	•	R = Rin	o compound sate eld blank	is detect	ted		plicate rip blank quipment bla	nk	
	A		<u>~+</u>						T.,	
1	PC-91	11	PC-59			21	MB		31	
2	PC-86	12 PC-98R				22			32	
3	PC-90	13	MW-5K K	<u>ч</u>		23			33	
4	PC-103	14	ARP-7			24			34	
5	MW-K5	15 M-87				25 26			35	
6	PC-56	16	PC-97			26 27			36	
7	PC-68	17	ARP-6B ARP-5A			27 28			37 38	

29

30

39


19

ARP-4A

PC-53

PC-58

10 PC-62

Notes:\_\_\_\_

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 13, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270794

# Sample Identification

PC-101R

PC-18

PC-55

ARP-1

L-635

PC-92

PC-122

#### Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

SDG # .abora	:21041H4 #:_270794 atory:_MWH_Laboratories	S		L	PLETE Level 2		SS WORK	SHEET		Date: ¬   a   Page: _ of _ Reviewer: A   2nd Reviewer: _ U
The sa	IOD: Chromium (EPA SV amples listed below were tion findings worksheets.	e revie\			ollowing	g vali	dation areas	. Validatior	n find	lings are noted in attached
	Validation	Area						Comme	ents	
I.	Technical holding times			Δ	Samplii	ng dat	es: 5   13	109		
II.	Calibration			N						
III.	Blanks			Δ						
IV.	ICP Interference Check San	nple (IC	S) Analysis	N	<u> </u>					
V.	Matrix Spike Analysis					<u>.۱۱</u>	ut Spe	a find		
VI.	Duplicate Sample Analysis									
VII.	Laboratory Control Samples	Laboratory Control Samples (LCS)				LCS				
VIII.	Internal Standard (ICP-MS)			N	Not utilitied					
IX.	Furnace Atomic Absorption	QC		7						
X.	ICP Serial Dilution			N	Nat minute for hard 2A					
XI.	Sample Result Verification			N				<u> </u>		
XII.	Overall Assessment of Data	a		A	ļ					
XIII.	Field Duplicates			2	-					
XIV.	Field Blanks			7						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	e	R = Rin	o compound sate eld blank	ds detect	ted	D = Dup TB = Tri <sub>l</sub> EB = Eq		k	
Validat	ted Samples:	<u> ~</u>	<u></u>		<del></del>	<del></del>			Т	
1	PC-101R	11			:	21			31	
2	PC-18	12				22			32	
3	PC-55	13				23			33	
4	ARP-1	14				24			34	
5	L-635	15				25			35	
6	PC-92	16				26			36	

PC-122 MB 

Notes:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 14, 2009

**LDC Report Date:** 

July 24, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270845

Sample Identification

H-58A

H-48

MC-65

PC-21A

#### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

The laboratory has indicated that there were no matrix spike (MS) analyses specified for the samples in this SDG, and therefore matrix spike analyses were not performed for this SDG

# VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270845

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270845

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270845

No Sample Data Qualified in this SDG

SDG#	:21041I4 <del>:_270845</del> atory:_MWH Laboratories		DATION		LETENES evel 2A	SS WORKS	SHEET	Page: _, of _, Reviewer:		
METH	OD: Chromium (EPA SV	V 846 N	lethod 60	10B)						
The sa /alidat	amples listed below were ion findings worksheets.	review	ed for eac	ch of the fo	ollowing val	idation areas.	Validation findin	gs are noted in attached		
	Validation	Area					Comments			
l.	Technical holding times			A	Sampling dat	tes: 5   14	109			
II.	Calibration			N						
111.	Blanks	,								
IV.	ICP Interference Check Sam	nple (ICS	) Analysis	N						
V.	Matrix Spike Analysis				Clin	+ Sparie	4,7			
VI.	Duplicate Sample Analysis			7						
VII.	Laboratory Control Samples	(LCS)		Δ	LCS					
VIII.	Internal Standard (ICP-MS)			N	Not Ut: 1: 2 d					
IX.	Furnace Atomic Absorption	QC		N	L					
Χ.	ICP Serial Dilution			N	Not mind for Loud ZA					
XI.	Sample Result Verification			N	U U					
XII.	Overall Assessment of Data	l		A_						
XIII.	Field Duplicates			<u>~</u>						
XIV.	Field Blanks			<u> </u>						
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin FB = Fi	o compound sate eld blank	ls detected	D = Duplic TB = Trip   EB = Equi				
		11	<u> </u>		21		31			
1 2	H-48	12	······································		22		32			
2	MC-65	13			23		33			
3	PC-21 <b>A</b>	14			24		34			
5	MB	15			25		35			
6	<u>NIB</u>	16		·····	26		36			
7		17			27		37			
8		18			28		38			
9		19			29		39			
10		20			30		40			

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 19, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270989

Sample Identification

FB0151909

FB051909-2

FB051909-2MS

FB051909-2MSD

#### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Samples FB0151909 and FB051909-2 and sample FB M-39 (from SDG 270992) were identified as field blanks. No chromium was found in these blanks.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

LDC #: 21041J4 <b>VALID</b>			DATION COMPLETENESS WORKSHEET				Date: 7   9   0	
SDG #: 270989			Level 2A				_ Page:_ <u>\</u> of_ <u>\</u>	
Labor	atory: MWH Laboratories	<u> </u>				2n/	Reviewer: 44	
METH	HOD: Chromium (EPA SV	N 846 Method 6	010B)			2110	Treviewer.	
Th		. may day, and for oa	ah af tha f	مانام درام الم	tion oroso Validat	ion findings o	re neted in etteched	
	amples listed below were tion findings worksheets.		ach of the f	ollowing vallua	lion areas. Validat	ion illidings al	e noted in attached	
	<u> </u>				•			
	Validation	Validation Area			Comments			
I.	Technical holding times		A	Sampling dates: 5   19   59				
11.	Calibration		N					
111.	Blanks		Δ					
IV.	ICP Interference Check San	nple (ICS) Analysis	N					
V.	Matrix Spike Analysis	<u> </u>	] MS/MSO					
VI.	Duplicate Sample Analysis		7					
VII.	Laboratory Control Samples	Δ	465					
VIII.	Internal Standard (ICP-MS)	N	Not U1: 1:2-d					
IX.	Furnace Atomic Absorption QC		7	\ \				
X.	ICP Serial Dilution		N	Not vanished for hul 2A				
XI.	Sample Result Verification		N	0				
XII.	Overall Assessment of Data							
XIII.	Field Duplicates		1					
XIV.	Field Blanks		20	FB: 1	, 2 , FB N	1-39 (fm	~ 270992]	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	lo compounds detected D = Duplicate sate TB = Trip blank leld blank EB = Equipment blank						
Validat	ed Samples:		•					
<u></u>	AU							
1	FB0151909	11		21		31		
2	FB051909-2	12		22		32		
3	FB051909-2MS	13		23		33		
4	FB051909-2MSD	14		24		34		
5	MB	15		25		35		
6		16	• • • • • • • • • • • • • • • • • • • •	26		36		
7		17		27		37		
8		18		28		38		
9		19		29		39		
10		20		30		40		
Notes	<b>3</b> :							

**VALIDATION COMPLETENESS WORKSHEET** 

Date: 7 /9/09

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 19, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270992

Sample Identification

M-39

FB M-39

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Samples FB0151909 and FB051909-2 (both from SDG 270989) and sample FB M-39 were identified as field blanks. No chromium was found in these blanks.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270992

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270992

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270992

No Sample Data Qualified in this SDG

	#: <u>270992</u> atory: <u>MWH Laboratories</u>	L	evel 2A			Page:_(_of Reviewer: 2nd Reviewer:			
The s	IOD: Chromium (EPA SW amples listed below were retion findings worksheets.			ollowing valid	ation areas. Valida	tion finding	s are noted in attache	ed	
	Validation A	rea			Com	ments		_	
1.	Technical holding times	А	Stila	Sampling date	s: 5/1a/o	٩		_	
11.	Calibration		N					1	
111.	Blanks								
IV.	ICP Interference Check Sample	le (ICS) Analysis	N						
V.	Matrix Spike Analysis		7	]					
VI.	Duplicate Sample Analysis		N					4	
VII.	Laboratory Control Samples (L	.CS)	A	Lcs					
VIII.	Internal Standard (ICP-MS)		N	N.+ (	11:1:2-6	<del></del>			
IX.	Furnace Atomic Absorption Q0	0	7	l L	l			_	
<u> X.</u>	ICP Serial Dilution	N	Not ruind for bul LA						
XI.	Sample Result Verification	N	U						
XII.	Overall Assessment of Data			,			_		
XIII.	Field Duplicates		7						
XIV.	Field Blanks		170	FB:2,	FB0151909	FROS	1907-2 (fm	270987	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin:	o compound: sate eld blank	s detected	D = Duplicate TB = Trip blank EB = Equipment bl	ank			
Validate	ed Samples:								
1	M-39 1	1		21		31			
2	FB M-39 1	2		22		32		_	
3	MB 1	3		23		33		1	
4	1	4		24		34			
5	1	5		25		35		_	
6	1	6		26		36		_	
7	1	7		27		37		1	
8	1	8		28		38		_	
9	1	9		29		39		_	
10	2	20		30		40			
Notes									

**VALIDATION COMPLETENESS WORKSHEET** 

Date: 7 /9 (09

LDC #: 21041K4

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 22, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271160

Sample Identification

M-124

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

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

# VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

SDG#	:21041L4 ::_271160 atory:_MWH Laboratories	LIDATION	Level 2A					Date: ¬ ( a ).  Page: _ 1 of _ 1  Reviewer: _ 4  2nd Reviewer: _ 4		
/IETH	OD: Chromium (EPA SV	V 846	Method 60	10B)						
	amples listed below were ion findings worksheets.	revie	wed for ead	ch of the fo	ollowing	g va	lidation areas.	Validation fin	dings are noted in attache	
	Validation A	Area						Comments		
l.	Technical holding times			<u> </u>	Sampli	ng da	tes: 5   22	109		
—— <del>!:</del>   .	Calibration			N						
<del></del> III.	Blanks			Δ						
IV.	ICP Interference Check Sam	ple (IC	S) Analysis	N						
V.	Matrix Spike Analysis	.L		N	? Clind Spraifid					
VI.	Duplicate Sample Analysis			2						
VII.	Laboratory Control Samples (LCS)			Δ	LC	. 2				
VIII.	Internal Standard (ICP-MS)			N	الما	9 <del>1</del>	U+: 1: 2-	<u>_d</u>		
IX.	Furnace Atomic Absorption (	QC		N	l l					
X.	ICP Serial Dilution			N	Not mind for bul 2A					
XI.	Sample Result Verification			N				U		
XII.	Overall Assessment of Data									
XIII.	Field Duplicates			12						
XIV.	Field Blanks			<u></u>						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	ds detect	ted	D = Duplic TB = Trip I EB = Equi			
√alidate	ed Samples:	. س	1						<b>V</b>	
1	M-124	11				21		31_		
2	MB	12				22		32		
3		13			- 1	23		33		
4		14				24		34		
5		15			;	25		35		
6		16			:	26		36		
7		17			1:	27		37		

10	20	30	40
Notes:			

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 26, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271248

Sample Identification

M-111A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- Pata are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

	atory: MWH Laboratories				evel 2		WORKSH		Date: 구 / 4 / ₀ Page: of Reviewer: △ 2nd Reviewer: └		
/ETH	OD: Chromium (EPA SV	V 846	Method 60	10B)							
	amples listed below were ion findings worksheets.	reviev	ved for eac	ch of the fo	ollowing	validati	ion areas. Va	alidation findi	ngs are noted in attached		
	Validation /	Area			Comments						
I	Technical holding times			A	Sampling	dates:	5 26	109			
11.	Calibration			N							
III.	Blanks			Δ_							
IV.	ICP Interference Check Sam	ple (IC	S) Analysis	N							
V.	Matrix Spike Analysis			k)	3 C	1: w+	Specil	:. ~d			
VI.	Duplicate Sample Analysis			7	)		<u> </u>				
VII.	Laboratory Control Samples	(LCS)		$\triangle$	LCS	•					
VIII.	Internal Standard (ICP-MS)			N	Not Ut:1:=-6						
IX.	Furnace Atomic Absorption (	QC		7	l l						
Χ.	ICP Serial Dilution			N	Not viriamed for Lul 2A						
XI.	Sample Result Verification			N	U U						
XII.	Overall Assessment of Data	·····									
XIII.	Field Duplicates			り							
XIV.	Field Blanks			<u> </u>							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	o compound: sate eld blank	s detected		D = Duplicate TB = Trip bla EB = Equipm	nk			
√alidate	ed Samples:	~ ~ <del>\</del>									
1	M-111A	11			21			31			
2	MB	12			22			32			
3		13			23			33			
4		14			24			34			
5		15			25			35			
6		16			26			36			
7		17			27			37			
8		18			28			38			
9		19			29			39			
10		20			30			40			

Date: 7/9/09

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 1, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271400

# Sample Identification

**TR-11** 

TR-12

TR-1

TR-10

FB060109

M-103

M-117

M-118

**DUPLICATE** 

FB060109MS

FB060109MSD

#### Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB060109 was identified as a field blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

# XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

Samples M-103 and DUPLICATE were identified as field duplicates. No chromium was detected in any of the samples.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

SDG # _abora	t: 21041N4 #: 271400 atory: MWH Laboratories	S		L	PLETE Level 2		SS WORKS	HEET	Date: ३ ∫م Page:of_ Reviewer: <u>گگ</u> 2nd Reviewer:
	IOD: Chromium (EPA SV			·	r-tl-czija	· · · ali	deller prope	/-!idetion findi	noted in attach
	amples listed below were tion findings worksheets.		Wed for eac	on on the r	OllOwn i	g van	Jation areas. v		ngs are noted in attach
	Validation A	Area						Comments	
l.	Technical holding times			A	Samplii	ing date	es: 6 \	09	
II.	Calibration			N					
III.	Blanks			A					
IV.	ICP Interference Check Sam	nple (I	CS) Analysis	N					
V.	Matrix Spike Analysis			Α	17 n	1 s	czm		
VI.	Duplicate Sample Analysis			7					
VII.	Laboratory Control Samples	(LCS	)		Lc	<u>s</u>			
VIII.	Internal Standard (ICP-MS)			N	N.	o 4	Uliliana	<u>۲</u>	
IX.	Furnace Atomic Absorption (	QC		2	l		L		
X.	ICP Serial Dilution			N	\\ \n\ \.	, <del>t</del> ,	yn:und	for Lead	2-A
XI.	Sample Result Verification			N				0	
XII.	Overall Assessment of Data	<u> </u>		A	]				
XIII.	Field Duplicates			20	12	<u>، (ه</u>	+9		
XIV.				20	FB	: ১			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	,	R = Rins	o compound sate eld blank	ds detecte	ed	D = Duplica TB = Trip bl EB = Equipr	lank	
/alidate	ed Samples:	<u></u>							
1 7	TR-11	11	FB060109MS	SD	2	21		31	
	TR-12	12	MB		2	22		32	
	TR-1	13			2	23		33	
	TR-10	14			2	24		34	
5 F	FB060109	15			2	25		35	
6 N	M-103 S	16			2	26		36	***************************************
	M-117	17			_  2	27		37	

M-117

M-118

Notes:\_\_

DUPLICATE り

FB060109MS

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 2, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271465

Sample Identification

M-121

M-120

FB060209

TR-4

**DUPLICATE** 

**DUPLICATEMS** 

**DUPLICATEMSD** 

#### Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB060209 was identified as a field blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

Samples TR-4 and DUPLICATE were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (mg/L)			-		
Analyte	TR-4	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	0.030	0.028	-	0.002 (≤0.010)	-	-	

# 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

	t: <u>271465</u>		L	_evel 2/	4		Page: 1 of 1			
Labora	atory: <u>MWH Laboratorie</u> s	-					Reviewer: 2nd Reviewer:			
METH	OD: Chromium (EPA S)	W 846	Method 60	010B)				zna Neviewer(		
	amples listed below were ion findings worksheets.		wed for ea	ch of the fo	ollowing	valida	ation areas. Validation findings	s are noted in attached		
	Validation	Aron					Commente			
		Alea		1	Committee	4-4	Comments			
I.   II.	Technical holding times  Calibration			<u> </u>	Sampling	dates:	6/2/09			
<del>  </del> 	Blanks			N				***************************************		
IV.	ICP Interference Check San	nnlo (IC	°C) Analysis	N N			· · · · · · · · · · · · · · · · · · ·			
V.	Matrix Spike Analysis	iipie (ic	73) Allalysis		7	. 1				
VI.	Duplicate Sample Analysis			2	<del>                                     </del>	->   /	MZD			
VII.	Laboratory Control Samples	(LCS)		2	L.,					
VIII.	Internal Standard (ICP-MS)	(200)		N		(Λ	1 · 1:2 d			
IX.	Furnace Atomic Absorption	QC		12	Not (1:1:5-7					
X.	ICP Serial Dilution			N	Not various for had 2A					
XI.	Sample Result Verification			N	Ö					
XII.	Overall Assessment of Data	1		A						
XIII.	Field Duplicates			3W	D:4+5					
XIV.	Field Blanks			70	FB:3					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	o compounds sate eld blank	s detected		D = Duplicate TB = Trip blank EB = Equipment blank			
√alidate	d Samples:	ېرر	ــــــــــــــــــــــــــــــــــــــ							
1 N	M-121	11			21		31			
2	<b>M-</b> 120	12			22		32			
3 F	B060209	13			23		33			
4 7	ΓR-4	14			24		34			
5 [	DUPLICATE	15			25		35			
6 [	DUPLICATEMS 16				26 36					
7 [	DUPLICATEMSD	17			27		37			
8	MB	18			28		38			
9		19			29		39			
10		20			30		40			
Notes:										

Date: 7 | 9 | 09

LDC #: 2104104 VALIDATION COMPLETENESS WORKSHEET

## LDC#: 21041O4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page: <u>   \  </u> of	
Reviewer:	8
2nd Reviewer:	_

METHOD: Metals (EPA Method 6010B)

(<u>) N NA</u> YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	ition (mg/L)		
Compound	4	5	(≤ 30) RPD	(≤ 0.010) Difference
Chromium	0.030	0.028	:	0.002

V:\FIELD DUPLICATES\FD\_inorganic\21041O4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 4, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271624

Sample Identification

TR-3

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

# XIII. Overall Assessment of Data

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

# XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

SDG :	t: 21041P4 #: 271624 atory: MWH Laboratories	VALIDATIOI		LETENE evel 2A	SS WORKSH	IEET	Date: 7   4   6  Page: 1 of 1  Reviewer: 4  2nd Reviewer: 4		
METH	IOD: Chromium (EPA SV	V 846 Method 60	)10B)						
	amples listed below were tion findings worksheets.	reviewed for eac	ch of the fo	ollowing va	lidation areas. Va	alidation findi	ngs are noted in attached		
	Validation /	Area				Comments			
l.	Technical holding times			Sampling da	tes: C H	109			
II	Calibration		N						
111.	Blanks								
IV.	ICP Interference Check Sam	ple (ICS) Analysis	N						
V.	Matrix Spike Analysis		<u>~</u>	1 C1:	~ + Spn: f:	-d			
VI.	Duplicate Sample Analysis		7	١					
VII.	Laboratory Control Samples	(LCS)		LC 5					
VIII.	Internal Standard (ICP-MS)		N	Not	Utilizad				
IX.	Furnace Atomic Absorption (	QC	N	l					
X	ICP Serial Dilution		N	Not vericuml for hal 2A					
XI.	Sample Result Verification		N	<u> </u>					
XII.	Overall Assessment of Data								
XIII.	Field Duplicates		N						
XIV.	Field Blanks								
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip blai EB = Equipm	nk			
Validat	ed Samples:	u.d							
1	TR-3	11		21		31			
2	MB	12		22		32			
3		13		23		33			
4		14		24		34			
5		15		25		35			
6		16		26		36			
7		17		27		37			
8		18		28		38			
9		19		29	·	39			
10		20	Marian .	30		40			
Notes	s:								

Date: 7 | 9 | 09

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 7, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270567

# Sample Identification

M-87

M-70

M-71

M-72

M-38

M-36

M-84

M-100

M-10

MD-2

M-22A

M-89

M-84MS

M-84MSD

#### Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-36 and MD-2 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	tion (mg/L)				A or P	
Analyte	M-36	MD-2	RPD (Limits)	Difference (Limits)	Flag		
Chromium	nium 32 32		0 (≤30)	-	-	•	

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270567

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270567

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270567

No Sample Data Qualified in this SDG

	#:_270567			L	_evel 2/		Page: \_of_\			
Labor	atory: MWH Laboratorie	<u>s</u>						Reviewer: A		
METH	HOD: Chromium (EPA S'	W 84	6 Method 60	010B)			•	Zild iteviewer		
	·			·		. P. d C	A A P L. P P P.			
	amples listed below were tion findings worksheets		ewed for ea	cn of the f	ollowing	/alidation areas.	validation findings	s are noted in attacr		
	Validation	Area					Comments			
I.	Technical holding times			<u>^</u>	Sampling	dates: 5 7	109			
II.	Calibration			N						
III.	Blanks		·	A						
IV.	ICP Interference Check Sar	mnle (l	CS) Analysis	N						
		ripie (i	CO) Allalysis		7	- 1	······································			
V.	Matrix Spike Analysis			A 2	11 ~	3 M 3 V				
VI.		Duplicate Sample Analysis			1-					
VII.	Laboratory Control Samples	S (LUS	)	<u>A</u>	<u>CC5</u>					
VIII.	Internal Standard (ICP-MS)			N . \	N 0 +	ut: lieu	<u>{</u>			
IX.	Furnace Atomic Absorption	QC		12						
X.	ICP Serial Dilution			N	Not round for Col 2A					
XI.	Sample Result Verification		<del> </del>	N						
XII.	Overall Assessment of Data	3			ļ					
XIII.	Field Duplicates			<u>5W</u>	D: C+ 13					
XIV.	Field Blanks			<u>~</u>	<u> </u>					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	s detected	D = Duplic TB = Trip I EB = Equi				
/alidate	ed Samples:									
Т	<u>Au</u>	<u>~ `</u>			1	T				
	M-87	11	M-22A		21		31			
	M-70	12	M-89		22		32			
	M-71	13	M-84MS	<u> </u>	23		33			
	M-72	14	M-84MSD		24		34			
5	M-38	15	MB		25		35			
6	M-36 °	16			26		36	,		
7	M-84	17			27		37			
8	M-100	18			28		38			
5 6 7 8 9	<b>M</b> -10	19			29		39			
10	M-2 MD-2	20			30		40			

Date: 7 | 9 | 09

LDC #: 21041Q4 VALIDATION COMPLETENESS WORKSHEET

#### LDC#: 21041Q4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

METHOD: Metals (EPA Method 6010B)

ON NA WN NA Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

	Concentra	(4.00)		
Compound	6	10	(≤ 30) RPD	
Chromium	32	32	0	

V:\FIELD DUPLICATES\FD\_inorganic\21041Q4.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 29, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271337

Sample Identification

TR-2

TR-5

TR-6

TR-7

TR-9

TR-8

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

: #:21041R4 6	VALIDATION		PLETENES evel 2A	EET	Date: ع ام اله Page: _ ر of _ ر Reviewer: كم 2nd Reviewer:	
THOD: Chromium (EPA S	W 846 Method 60	)10B)				Zilu iveviewei.
samples listed below wer lation findings worksheets	e reviewed for eads.	ch of the fo	ollowing vali	dation areas. Va	ilidation findi	ngs are noted in attached
Validation	ı Area			C	Comments	
Technical holding times		Α_	Sampling dat	es: 5 29	109	
. Calibration		N				
. Blanks		^				
/. ICP Interference Check Sa	mple (ICS) Analysis	N				
. Matrix Spike Analysis		N	G C1:	v4 Speri	I: d	
Duplicate Sample Analysis		7	)			
I. Laboratory Control Sample	es (LCS)		Les			
II. Internal Standard (ICP-MS	)	N	Not	Ut: 1: End		
. Furnace Atomic Absorption	n QC	N	l	<u> </u>		
ICP Serial Dilution		N	Not "	mind f	v Lad	2A
Sample Result Verification		N		U	***	
Overall Assessment of Da	ta	Α				
II. Field Duplicates		~				
V. Field Blanks		7				
: A = Acceptable N = Not provided/applicab SW = See worksheet	le R = Rin	o compound sate eld blank	ls detected	D = Duplicate TB = Trip blar EB = Equipme	nk	
lated Samples:	wol					
TR-2	11		21		31	
TR-5	12		22		32	
TR-6	13		23		33	
TR-7	14		24		34	
TR-9	15		25		35	
TR-8	16		26		36	
MB	17		27		37	
	18		28		38	
	19		29		39	
	20		30		40	
es:	19		29		39	

Date: 7/9/09

## Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 11, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270628

## Sample Identification

ART-1

PC-133MS

ART-2

PC-133MSD

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121 PC-133

ART-9

**PC-121MS** 

PC-121MSD

#### Introduction

This data review covers 22 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 270628

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 270628

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 270628

No Sample Data Qualified in this SDG

LDC	#: 21041T4	VA	LIDATIO				Date: <u>٦   ٩  </u> ٥				
	#: 270628	<del></del> .		L	_evel	2A		Page:_\_of_\_			
Labo	ratory: <u>MWH Laborato</u>	ories	_						Reviewer: 2nd Reviewer:		
MET	HOD: Chromium (EPA	A SW 84	6 Method 60	010B)					2.10 1.01.01.01.		
Tho c	camples listed holowy	wore rovi	awad for aa	ch of the f	- - Ollowin	30 V	alidation areas Va	didation findi	ngs are noted in attached		
	ation findings workshe		eweu ioi ea	ch of the r	Ollowii	ıg v	alluation areas. Va	illuation illiuli	igs are noted in attached		
				T							
	Validat	ion Area	<u> </u>					Comments			
I.	Technical holding times	S		Δ	Samp	ling c	lates: 5   11	29			
11.	Calibration			N			`				
Ш.	Blanks			A							
IV.	ICP Interference Check	Sample (I	CS) Analysis	N.							
V.	Matrix Spike Analysis		A	17.	<u> </u>	SIMED					
VI.	Duplicate Sample Anal	ysis		7	\						
VII.	Laboratory Control San	Laboratory Control Samples (LCS)				2					
VIII.	Internal Standard (ICP-	N	<u>  ~ </u>	o +	W1:1:2nd						
IX.	Furnace Atomic Absorp	Furnace Atomic Absorption QC									
Χ.	ICP Serial Dilution	ICP Serial Dilution				Not reviewed for Cul 2A					
XI.	Sample Result Verifica	Sample Result Verification				0					
XII.	Overall Assessment of	Data		A							
XIII.	Field Duplicates			N							
XIV	. Field Blanks			4							
Note:	A = Acceptable N = Not provided/appli SW = See worksheet	cable	R = Rin	o compound sate eld blank	ls detec	ted	D = Duplicate TB = Trip blan EB = Equipme				
√alida	ted Samples:										
		Ay .	<u>et</u>		Т			T I			
1	ART-1	11	SF-1			21	PC-133MS	31			
2	ART-2	12	PC-117	· · · · · · · · · · · · · · · · · · ·		22	PC-133MSD	32			
3	ART-3	13	PC-118			23	MB	33			
4	ART-4	14	PC-119			24		34			
5	ART-6	15	PC-120			25		35			
6	ART-7	16	PC-121			26		36			
7	ART-8	17	PC-133			27		37			
8	PC-99R2/R3	18	ART-9			28		38			
9	PC-115R	19	PC-121MS			29		39			
10	PC-116R	20	PC-121MSD			30		40			

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 20, 2009

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271066

Sample Identification

CLDR-2

M-130

M-129

M-67

M-66

FB-CLDR-2

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-CLDR-2 was identified as a field blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271066

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271066

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271066

No Sample Data Qualified in this SDG

SDG#	:21041U4 #:_271066 atory:_MWH_Laboratories		LIDATIOI -		<b>LETEN</b> evel 2A	ESS WORK	SHEET	Page: علمان Page: رام ر Reviewer: علمان 2nd Reviewer: علمان		
METH	IOD: Chromium (EPA S\	N 846	6 Method 60	)10B)						
	amples listed below were tion findings worksheets.		ewed for ead	ch of the fo	ollowing v	alidation areas	. Validation findi	ngs are noted in attached		
	Validation	Area					Comments			
l.	Technical holding times			٨	Sampling	dates: 5 / 2	0 09			
II.	Calibration			N						
III.	Blanks			A						
IV.	ICP Interference Check San	nple (l	CS) Analysis	Ν						
V.	Matrix Spike Analysis			N	} C	icnt Spe	n: find			
VI.	Duplicate Sample Analysis			7	)					
VII.	Laboratory Control Samples	(LCS)	)	A	Les					
VIII.	Internal Standard (ICP-MS)			N	No. 2	+ Ul: li =	<u>- d</u>			
IX.	Furnace Atomic Absorption	QC		N	l L					
Χ.	ICP Serial Dilution			N	Not mind for Cul 2A					
XI.	Sample Result Verification			N			0			
XII.	Overall Assessment of Data	l		٨						
XIII.	Field Duplicates			N			Manie			
XIV.	Field Blanks			20	FB:	6				
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin:	o compound sate eld blank	s detected	D = Dupli TB = Trip EB = Equ				
	ed Samples:	ve	+		···	_				
1	CLDR-2	11			21		31			
2	M-130	12			22		32			
3	<b>M</b> -129	13			23		33			
4	M-67	14			24		34			
5	M-66	15			25		35			
6	CLDR-2 FB-G <del>LDR2</del>	16			26		36			
7	MB	17			27		37			
8		18			28		38			
9		19			29		39			
10		20			30		40			

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 8, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271687

Sample Identification

M-7B

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- Partial Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

21041V4 : 271687 tory: MWH Laboratories OD: Chromium (EPA SV	<u> </u>		L			1661	Date: ¬   ¬   ¬   ¬   ¬   ¬   ¬   ¬   ¬   ¬		
mples listed below were on findings worksheets.		red for eac	h of the fo	ollowing va	alidation ar	eas. V	alidation findir	ngs are noted in attached	
Validation	Area_						Comments		
Technical holding times	<u> </u>		A	Sampling d	ا ates: و	181	09		
Calibration			N						
Blanks			A	<u> </u>		***************************************			
ICP Interference Check Sam	ıple (ICS	3) Analysis	N	ļ					
Matrix Spike Analysis	Matrix Spike Analysis				~+ Sp-	<u>. د: (، د</u>	ৰ্		
Duplicate Sample Analysis			2						
Laboratory Control Samples	Laboratory Control Samples (LCS)								
Internal Standard (ICP-MS)			N	100 t	ut:1:	<u>t</u>			
Furnace Atomic Absorption	<u> QC</u>		2	1					
ICP Serial Dilution			N	Not	vwim.	1	r hul 2	-A	
Sample Result Verification			N						
Overall Assessment of Data			Δ						
Field Duplicates			N						
Field Blanks			2						
A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:		R = Rins FB = Fie	sate	s detected	TB =	= Trip bla	ank		
W-7B	11			21			31		
MB	12			22			32		
	13			23			33		
	14			24			34		
	15			25			35		
	16			26			36		
,	17			27			37		
	<u> </u>				•		1 1		
	18			28			38		
	tory: MWH Laboratories  OD: Chromium (EPA SW mples listed below were on findings worksheets.  Validation of the total process of the to	tory: MWH Laboratories  DD: Chromium (EPA SW 846 Marples listed below were review on findings worksheets.  Validation Area  Technical holding times  Calibration  Blanks  ICP Interference Check Sample (ICS Matrix Spike Analysis  Duplicate Sample Analysis  Laboratory Control Samples (LCS)  Internal Standard (ICP-MS)  Furnace Atomic Absorption QC  ICP Serial Dilution  Sample Result Verification  Overall Assessment of Data  Field Duplicates  Field Blanks  A = Acceptable N = Not provided/applicable SW = See worksheet  d Samples:  M-7B  11  13  14  15	Technical holding times  Calibration  Blanks ICP Interference Check Sample (ICS) Analysis Matrix Spike Analysis Duplicate Sample Analysis Laboratory Control Samples (LCS) Internal Standard (ICP-MS) Furnace Atomic Absorption QC ICP Serial Dilution Sample Result Verification Overall Assessment of Data Field Duplicates Field Blanks  A = Acceptable N = Not provided/applicable SW = See worksheet  A-7B  A-7B  11  12  13  14  15	Technical holding times  Calibration  Natrix Spike Analysis  Duplicate Sample Analysis  Laboratory Control Samples (LCS)  Internal Standard (ICP-MS)  Furnace Atomic Absorption QC  ICP Serial Dilution  Sample Result Verification  N Devall Assessment of Data  Field Duplicates  N A Samples:  A C Robert Samples  N D N Compounds  R = Rinsate  Field blanks  A Samples:  A R A 12  A R 12  A R 12  A 13  A 14  A 15	Tevel 2A tory: MWH Laboratories  DD: Chromium (EPA SW 846 Method 6010B)  Imples listed below were reviewed for each of the following valor findings worksheets.  Validation Area  Technical holding times Calibration Blanks ICP Interference Check Sample (ICS) Analysis Matrix Spike Analysis Duplicate Sample Analysis Laboratory Control Samples (LCS) Internal Standard (ICP-MS) N Furnace Atomic Absorption QC ICP Serial Dilution N Sample Result Verification Overall Assessment of Data Field Duplicates Field Blanks  A = Acceptable N = Not provided/applicable SW = See worksheet  A = Acceptable N = Not provided/applicable SW = See worksheet  A = 11 A B 12 21 22 23 14 24 15 25	Level 2A  tory: MWH Laboratories  DD: Chromium (EPA SW 846 Method 6010B)  mples listed below were reviewed for each of the following validation aron findings worksheets.  Validation Area  Technical holding times  Calibration  Blanks  ICP Interference Check Sample (ICS) Analysis  Matrix Spike Analysis  Duplicate Sample Analysis  Laboratory Control Samples (LCS)  Internal Standard (ICP-MS)  Furnace Atomic Absorption QC  ICP Serial Dilution  Sample Result Verification  Overall Assessment of Data  Field Duplicates  Field Blanks  A = Acceptable N = Not provided/applicable SV = See worksheet  d Samples:  A-7B  11  12  21  A-7B  13  23  14  15  25  Level 2A  Level 2A  Sampling dates:  C  Sampling dates:  Sampling dates:  C  Sampling dates:  Sampling dates:  C  Sampling dates:  Sampling	Level 2A  tory: MWH Laboratories  DD: Chromium (EPA SW 846 Method 6010B)  Imples listed below were reviewed for each of the following validation areas. Von findings worksheets.  Validation Area  Technical holding times  Calibration  N  Blanks  ICP Interference Check Sample (ICS) Analysis  Duplicate Sample Analysis  Duplicate Sample Analysis  Laboratory Control Samples (LCS)  Internal Standard (ICP-MS)  N  ICP Serial Dilution  Sample Result Verification  Overall Assessment of Data  Field Duplicates  Field Blanks  A = Acceptable  N = Not provided/applicable  N = Rinsate Field blank  A = Acceptable N = Not provided/applicable SW = See worksheet  A = Rinsate FB = Field blank  B = Field blank  B = Equipn  A Samples:  D = Duplicate TB = Trip bla EB = Equipn  A Samples:  D = Duplicate TB = Trip bla EB = Equipn  A Samples:  D = Duplicate TB = Trip bla	Level 2A  tory: MWH Laboratories  DD: Chromium (EPA SW 846 Method 6010B)  mples listed below were reviewed for each of the following validation areas. Validation findir on findings worksheets.  Validation Area  Comments  Technical holding times  A Sampling dates: ( ) ③	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 9, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271791

Sample Identification

H-28A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

SDG#	:21041W4 : 271791 atory:_MWH Laboratories			PLETENESS WO Level 2A	RKSHEET	Date:_1 Page: Reviewer:_ 2nd Reviewer:_	AI					
The sa	OD: Chromium (EPA S) amples listed below were ion findings worksheets.	e reviewed for eac		ollowing validation ar	eas. Validation finding	_						
	Validation			Comments								
I,	Technical holding times		A	Sampling dates:	19109							
II.	Calibration		N									
III.	Blanks		<u> </u>									
IV.	ICP Interference Check Sar	nple (ICS) Analysis	N									
V.	Matrix Spike Analysis		2	( Clint 5	serifid							
VI.	Duplicate Sample Analysis		7									
VII.	Laboratory Control Samples	(LCS)		Lis								
VIII.	Internal Standard (ICP-MS)		N	Not Utilized								
IX.	Furnace Atomic Absorption	QC	2	l l								
Χ.	ICP Serial Dilution		N	Not vericed for W 2A								
XI.	Sample Result Verification		N	U								
XII.	Overall Assessment of Data		A									
XIII.	Field Duplicates		N									
XIV.	Field Blanks		7									
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	o compound sate eld blank	TB =	Duplicate : Trip blank : Equipment blank							
√alidate	ed Samples:	wat										
1	H-28A	11		21	31							
	MB	12		22	32							
3		13		23	33							
4		14		24	34							
5		15		25	35							
6		16		26	36							
7		17		27	37							
8		18		28	38							
9		19		29	39							
10		20		30	40							

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 9 through June 10, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271832

Sample Identification

MW-K4 ARP-1

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

SDG #	t:21041X4 #: <u>271832</u> atory: <u>MWH Laboratorie</u> s	VALIDATIO		evel 2A	Date: 7 (a) Page: _, of _, Reviewer:			
METH	HOD: Chromium (EPA S)	N 846 Method 6	010B)				2nd Reviewer:	
	amples listed below were tion findings worksheets.		ach of the fo	ollowing v	alidation areas. \	/alidation findi	ngs are noted in attached	
	Validation	Area				Comments		
I.	Technical holding times		A	Sampling o	lates: 💪 🥱	- 6/10	109	
11,	Calibration		N					
111.	Blanks		Δ.					
IV.	ICP Interference Check San	nple (ICS) Analysis	· N					
V.	Matrix Spike Analysis		N	1 C1:	~ 4 5 pec.	4: -4		
VI.	Duplicate Sample Analysis		N	}				
VII.	Laboratory Control Samples	(LCS)		LC 3				
VIII.	Internal Standard (ICP-MS)		N	Not	W+:1;=~	d		
IX.	Furnace Atomic Absorption	QC	N	l				
X.	ICP Serial Dilution		N	Not miend for had 22				
XI.	Sample Result Verification		N	0				
XII.	Overall Assessment of Data	l .	A					
XIII.	Field Duplicates		12					
XIV.	Field Blanks		N					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rir	lo compounds nsate ield blank	s detected	D = Duplicat TB = Trip bla EB = Equipn	ank		
validate	ed Samples:	a Lib			····			
1	MVV-K4	11		21		31		
2	ARP-1	12		22		32		
3	MB	13		23		33		
4		14		24	***************************************	34		
5		15		25		35		
6		16		26		36		
7		17		27		37		
8		18		28		38		
9		19		29		39		
10		20		30		40		
Notes:								

Date: 7/9/09

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 10, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271854

Sample Identification

M-6A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

## VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

LDC #: 21041Y4 VALIDATION COMPLETENESS SDG #: 271854 Level 2A Laboratory: MWH Laboratories							HEET	Page: 1 9 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
METH	OD: Chromium (EPA S'	W 846 M	lethod 60	10B)				Zild Noviewor.		
	imples listed below were ion findings worksheets		ed for ead	ch of the fo	ollowing va	alidation areas. \	Validation findi	ngs are noted in attached		
	Validation	Area					Comments			
l.	Technical holding times			A	Sampling d	ates: Lelio	109			
H.	Calibration			N						
III.	Blanks			Α						
IV.	ICP Interference Check Sar	nple (ICS)	Analysis	N						
V.	Matrix Spike Analysis			7	) c1:	~ + Sprif	: A			
VI.	Duplicate Sample Analysis			2	1	1				
VII.	Laboratory Control Samples	(LCS)		Δ	LLS					
VIII.	Internal Standard (ICP-MS)			N	Not	Utilizad	!			
IX.	Furnace Atomic Absorption	QC		2	l	l				
X.	ICP Serial Dilution			N	Not reviewed for Lad 2A					
XI.	Sample Result Verification			N			U			
XII.	Overall Assessment of Data	3		<u>^</u>		·				
XIII.	Field Duplicates			2		··· A··				
XIV.	Field Blanks			<u> </u>						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	÷	R = Rins	o compound: sate eld blank	s detected	D = Duplica TB = Trip bl EB = Equip	lank			
Validate	d Samples:	<u> </u>								
1 r	M-6A	11			21	***************************************	31			
2	MB	12			22		32			
3		13		<u>.</u>	23		33			
4		14			24	, , , , , , , , , , , , , , , , , , , ,	34			
5		15			25		35			
6		16			26		36			
7		17			27		37			
8		18			28		38			
9		19			29		39			
10		20	<u></u>		30		40			
Notes:										

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 15, 2009

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271999

Sample Identification

MC-53

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## VI. Matrix Spike Analysis

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

### VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

SDG # _abora	: 21041Z4 :: 271999 atory: <u>MWH Laboratories</u>	<u> </u>	L	<b>LETENESS</b> evel 2A	Date: 7   9   50 Page: 10f \ Reviewer: 2nd Reviewer:	
The sa	OD: Chromium (EPA SV amples listed below were ion findings worksheets.			ollowing validati	on areas. Validation fi	ndings are noted in attached
	Validation	Area			Commen	s
l.	Technical holding times		A	Sampling dates:	6/5/09	
11.	Calibration		N			
111.	Blanks		A			
IV.	ICP Interference Check San	nple (ICS) Analysis	N			
V.	Matrix Spike Analysis		2	& Clint	Sprified	
VI.	Duplicate Sample Analysis		N			
VII.	Laboratory Control Samples	(LCS)	A	LCS		
VIII.	Internal Standard (ICP-MS)		N	Not a	t:lizud	
IX.	Furnace Atomic Absorption	QC	1 1/2	l l		
X.	ICP Serial Dilution		N	Not rw	; and for her	( 2A
XI.	Sample Result Verification		. N		U	
XII.	Overall Assessment of Data		A			
XIII.	Field Duplicates		<u>  ~ </u>			
XIV.	Field Blanks		<u> </u>			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Ri	No compound nsate Field blank	s detected	D = Duplicate TB = Trip blank EB = Equipment blank	
	ed Samples:	ve t				
1 1	MC-53	11		21	31	
	MB	12		22	32	
3		13		23	33	
4		14		24	34	
5		15		25	35	
6		16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	
Notes:	•					

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 16, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 272056

Sample Identification

M-29

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

## VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

SDG Labor	#: 21041AA4 #: 272056 ratory: MWH Laboratories	S	IESS WOF	RKSHEET	Page: 1 of 1  Reviewer: Δ  2nd Reviewer:					
The s	AOD: Chromium (EPA S) amples listed below were tion findings worksheets.	e revie		·	ollowing	/alidation are	eas. Validation findi	ngs are noted in attached		
	Validation	Area		45.0			Comments			
I.	Technical holding times			A	Sampling dates: 4 16 39					
II.	Calibration			N						
111.	Blanks			A		W-1.44				
IV.	ICP Interference Check San	nple (IC	S) Analysis	N						
V.	Matrix Spike Analysis			7	2 Clint Sperified					
VI.	Duplicate Sample Analysis			7						
VII.	Laboratory Control Samples	(LCS)		Δ	LUS					
VIII.	Internal Standard (ICP-MS)			N	Not	u4:1:	tud			
IX.	Furnace Atomic Absorption	QC		N	l l					
<u>x.</u>	ICP Serial Dilution			N	Not viviand for had 2A					
XI.	Sample Result Verification			N			V			
XII.	Overall Assessment of Data	l		A						
XIII.	Field Duplicates			7						
XIV.	Field Blanks			<u> </u>						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	o compound sate eld blank	s detected	i						
Validat	ed Samples:									
1	M-29	11			21		31			
2		12			22		32			
3		13			23		33			
4		14			24		34			
5		15			25		35			
6		16			26		36			
7		17			27		37			
8		18			28		38			
9		19			29		39			
10		20	eu au		30		40			
Notes								***************************************		

Date: 7/9/09

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 25, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 272306

Sample Identification

PC-94

PC-2

PC-1

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

SDG	#: <u>21041BB4</u> #: <u>272306</u> atory: <u>MWH Laboratorie</u> :	VALIDATIC		PLETENES Level 2A	Date: ﴿ مَا الْهِ مَا كُلُونُهُ عَلَيْهِ الْهُ كُلُونُهُ لِي الْهُ كُلُونُهُ الْهُ كُلُونُهُ الْهُ كُلُونُهُ ك Reviewer: على الله على الله الله الله الله الله الله الله ال					
	-					2nd Reviewer:				
METH	HOD: Chromium (EPA S)	W 846 Method 6	8010B)							
	amples listed below were tion findings worksheets		ach of the f	ollowing valid	lation areas. Validation	findings are noted in attache				
	Validation	Area			Commer	nts				
1.	Technical holding times		<u> </u>	△ Sampling dates: ७ (25 (09						
11.	Calibration		N							
111.	Blanks									
IV.	ICP Interference Check Sar	nple (ICS) Analysis	N							
V.	Matrix Spike Analysis		2	3 C1:-	A Sprished					
VI.	Duplicate Sample Analysis		7							
VII.	Laboratory Control Samples	(LCS)	A	ucs						
VIII.	Internal Standard (ICP-MS)		N	Not c	nt: lieud					
IX.	Furnace Atomic Absorption	QC	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \							
X	ICP Serial Dilution		N	Not viriand for hall 2A						
XI.	Sample Result Verification		N	U						
XII.	Overall Assessment of Data	<b>.</b>	Δ							
XIII.	Field Duplicates		l N							
XIV.	Field Blanks		N							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Ri	No compound nsate Field blank	s detected	D = Duplicate TB = Trip blank EB = Equipment blank					
√alidat	ed Samples:	سلر.								
1	PC-94	11		21	3	1				
	PC-2	12		22	3:	2				
3	PC-1	13		23	3:	3				
4	MB	14		24	3.	4				
5		15		25	3:	5				
6		16		26	36	3				
7		17		27	3	7				
8		18		28	38	В				
9		19		29	39	9				
10		20		30	40	0				
Notes	:									

# 2009 Annual Remedial Performance Sampling Data Validation Reports LDC# 21041

Wet Chemistry



## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 13, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270815

Sample Identification

PC-65

PC-66

PC-67

PC-28

PC-31

PC-40

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

## IV. 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.

## V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270815

No Sample Data Qualified in this SDG

SDG#	: 21041A6 ±: 270815 atory: MWH Laboratories		.IDATION		PLETE Level 2		SS WORKSHEET		Date: ¬ ( a ) o Page: 1 of 1 Reviewer: A 2nd Reviewer:
METH	IOD: (Analyte) Perchlora	ate (F	EPA Method	<u>d 314.0),</u>	TDS (E	<u> </u>	<u>Method 160.1</u> SM 2.	<u>१५०</u> ५	<u>.</u>
The sa	amples listed below were tion findings worksheets.	revie	wed for eac	ch of the fo	ollowin	g val	idation areas. Validatio	n findi	lings are noted in attached
	Validation A	Area					Comm	ients	!
l.	Technical holding times			Ā	Sampli	ing da	ates: 5   13   0	9	!
lla.	Initial calibration			N					
IIb.	Calibration verification			N					
111.	Blanks			A					
IV	Matrix Spike/Matrix Spike Du	uplicate	∌S		<u> }</u>	f	270704		
V	Duplicates			7	\				
VI.	Laboratory control samples			Δ	LCS	3   6	-C3D		
VII.	Sample result verification			N				**********	
VIII.	Overall assessment of data			A	<u> </u>				
IX.	Field duplicates		,	2	<u> </u>				
	Field blanks								
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	ı	R = Rins	lo compound nsate ield blank	is detect	ted	D = Duplicate TB = Trip blank EB = Equipment blar	nk	
Validat	ted Samples:	<u>ســـــ</u>	<u>L</u>						
	PC-65	11				21		31	
	PC-66	12				22	I	32	
3	PC-67	13				23		33	
4	PC-28	14				24		34	
5	PC-31	15				25		35	
6	PC-40	16				26		36	
<del> </del>	10.0					27	1	37	

Notes:\_

LDC #: 21041A6 SDG #: 270815

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: <u>\</u> of <u>\</u>
Reviewer: 🔥 🕽
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	<u>Parameter</u>
1-6	W	pH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C104)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
i ,_,		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
5.7 x 1		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 15, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270857

# Sample Identification

MC-3

MC-29

MC-51

MC-50

MC-45

MC-97

MC-93

MC-3DUP

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

## a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

## III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270857

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270857

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270857

No Sample Data Qualified in this SDG

## 

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	Δ	Sampling dates: 5 15 09
lla.	Initial calibration	N	
Ilb.	Calibration verification	N	
111.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	} Dup
V	Duplicates	A	
VI.	Laboratory control samples		LL5   LL 3 D
VII.	Sample result verification	N	·
VIII.	Overall assessment of data		
IX.	Field duplicates	2	
x	Field blanks	7	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

valida	ted Samples.	- wash		
1	MG3 MC-3	11	21	31
2	MC29 MC-27	12	22	32
3	MC51 MC-51	13	23	33
4	MC50 MC-50	14	24	34
5	MC45 MC-45	15	25	35
6	MC97 ML-97	16	26	36
7	MC93 MC-93	17	27	37
8 &		18	28	38
9	7 B	19	29	39
10		20	30	40

Notes:	

LDC #: 2104186 SDG #: 270857

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	1	_of_	1
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All circled methods are applicable to each sample.

Sample	ID Matrix	B
Sample		Parameter
1-7	$+$ $\omega$	PH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CIO3)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
4 8	$-\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
7 . 7 . 7 .		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph tds ci f NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L		pH TDS CLE NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:		

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 20, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271048

Sample Identification

PC-64

FB052009

EB052009

M-65

M-134

**DUPLICATE** 

PC-64DUP

## Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Sample Analyte		Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-65	Total dissolved solids	24 days	7 days	J- (all detects) R (all non-detects)	Р

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

## II. Calibration

## a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

## III. Blanks

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

Sample EB052009 was identified as an equipment blank. No contaminant concentrations were found in this blank.

Sample FB052009 was identified as a field blank. No contaminant concentrations were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB052009	5/20/09	Perchlorate	4.1 ug/L	PC-64 M-65 M-134 DUPLICATE

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

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples M-134 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration					
Analyte	M-134	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	3000 mg/L	2850 mg/L	5 (≤30)	-	_	•
Perchlorate	123000 ug/L	125000 ug/L	2 (≤30)	-	-	-

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271048

SDG	Sample	Analyte	Flag	A or P	Reason
271048	M-65	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271048

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271048

No Sample Data Qualified in this SDG

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SDG 7	#:21041C6 #:_271048 ratory: <u>MWH Laboratories</u>		LIDATIO		_evel		:33 YYO	KNOFIL	<b>:</b> E1	Page: 1 of 1 Reviewer: A 2nd Reviewer: (
METH	HOD: (Analyte) Perchloi	rate (	EPA Metho	d 314.0),	TDS (	(EPA	Method 16	60.1)\ ≤ <i>I</i>	125400	
	samples listed below were ation findings worksheets.		wed for each	ch of the fo	ollowi	ing va	alidation ar	eas. Vali	dation findir	ngs are noted in attached
	Validation	Area						C	omments	
1.	Technical holding times			SW	Samp	pling d	ates: ऽ	20	39	
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			A						
IV	Matrix Spike/Matrix Spike Du	uplicat	es	7	<u> </u>	りょ	2			
V	Duplicates			A	$\coprod$					
VI.	Laboratory control samples			A	4	_5	LLSA			
VII.	Sample result verification			N	<u> </u>	`				
VIII.	Overall assessment of data			Δ	<u> </u>					
IX.	Field duplicates			<u> </u>	D	: 5	+ (6			
L <sub>X</sub>	Field blanks			SW	FR	<u> </u>	*EB=	3		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	;	R = Rin:	o compound: sate eld blank	s detec	cted	TB =	Ouplicate Trip blank Equipmer		
Validat	ted Samples:	<u>~ v</u>	<del></del>					·		
1	PC-64	11				21			31	
2	FB052009	12				22			32	
3	EB052009	13				23			33	
4	M-65 -	14				24			34	
5	M-134	15				25			35	
6	DUPLICATE	16				26			36	
7	PC-64DUP	17				27			37	
8	PB	18				28			38	
		10							20	

Notes:			

LDC #: 2104166 SDG #: 271048

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID	Moteiv	Parameter
Sample ID		Parameter
1-6	W	PH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR (C134)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2C 7	$\mathcal{U}$	PH (DS)CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<u> </u>		

Comments:	

LDC #: 21041C6 SDG #: 271348

## **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

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2nd reviewer:_		

All circled dates have exceeded the technical holding time.

YN N/A

Were all samples preserved as applicable to each method?

YN N/A

Were all cooler temperatures within validation criteria? Method: 160.1 JAh 2540C Parameters: ZGT Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier J-IRP (W) 20 09 (24 days 4

LDC #: 21041C6 SDG #: 271048

# **VALIDATION FINDINGS WORKSHEET**

Field Blanks

Were target analytes detected in the field blanks?

2nd Reviewer: Page: 1 of 1 Reviewer: 🚓 🖈

Sampling date: s/20/20 Soil factor applied Field blank type: (circle one) Field Blank 1 Rinsate / Other	Soil facto	or applied	Associated Samples:		, 4.c (>10x)		
Analyte	Blank ID		Ö	Sample Identification			
	2						
C 12.	 T						
				-		=	
***************************************	Associated sample units:	ole units:	The second secon				
Sampling date: Soil factor applied Field blank type: (circle one) Field Blank / Rinsate / Other	Soil facto Field Blank	Soil factor applied eld Blank / Rinsate / Other:	Associated Samples:				

ation					
Sample Identification	***************************************				
Š					
Blank ID					
Analyte					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#	21041C6	_
SDC#	See Cover	

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u>_</u> _of	1
Reviewer:	A	1
2nd Reviewer:	L	_

Inorganics, Method See Cover

(YN NA Y N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(≤ 30)		
Analyte	5 6		RPD	
TDS	3000	2850	5	
Perchlorate (ug/L)	123000	125000	2	

V:\FIELD DUPLICATES\FD\_inorganic\21041C6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 21, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271121

# Sample Identification

M-64

M-136

MW-16

FB052109

EB052109

MW-132

MW-133

M-126

M-127

**DUPLICATE** 

## Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

## a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB052109 was identified as an equipment blank. No contaminant concentrations were found in this blank.

Sample FB052109 was identified as a field blank. No contaminant concentrations were found in this blank.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples MW-132 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration					D!#		
Analyte	MW-132	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P		
Total dissolved solids	1482 mg/L	1584 mg/L	7 (≤30)	-	-	-		
Perchlorate	7410 ug/L	9670 ug/L	26 (≤30)	-	-			

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271121

No Sample Data Qualified in this SDG

SDG#	#:21041D6 #:_271121 atory:_MWH_Laboratories		LIDATION		PLETEI Level 2		S WOR	KSHEET		Date: +   a   c Page: \ of \ Reviewer: A ? 2nd Reviewer: \
МЕТН	IOD: (Analyte) Perchlo	rate (I	EPA Metho	d 314.0), <sup>-</sup>	TDS (EF	<u>РА М</u>	lethod 160	1) 3M25	7400	
The sa	amples listed below were tion findings worksheets	revie	wed for each	ch of the fo	ollowing	valio	dation area	s. Validatio	n find	lings are noted in attached
	Validation	Area						Comm	ents	104
l.	Technical holding times			A	Sampling	g date	es: 5   2	1/00	١	
IIa.	Initial calibration			N			****			
Ilb.	Calibration verification			N					<b></b>	
111.	Blanks			A	<u> </u>					
IV	Matrix Spike/Matrix Spike D	uplicate	∋s	<u>~</u>	3 C	<u>-l:                                    </u>	A 5p.	rif: d		
V	Duplicates	, ,		<u> </u>	11					
VI.	Laboratory control samples			Δ	LCS	14	C 2 D			
VII.	Sample result verification			N		·				
VIII.	Overall assessment of data								· · · · · · · · · · · · · · · · · · ·	
IX.	Field duplicates			5ట			10			
L <sub>x</sub>	Field blanks			70	FB:	: <u> </u>	E13:	5		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	€	R = Rin	lo compound isate ield blank	ls detected	d		olicate ip blank quipment blar	ık	
Validate	ed Samples:	<u>۸</u>	~~ <del>L</del>							
1	M-64	11	73		21		IAI-RW		31	
2	M-136	12			22	2			32	4.44
3	MVV-16	13			23	<u>.                                    </u>			33	
4	FB052109	14			24	1			34	

		an wor			
1	M-64	11 73	21	31	
2	M-136	12	22	32	
3	MVV-16	13	23	33	
4	FB052109	14	24	34	
5	EB052109	15	25	35	
6	MW-132 "	16	26	36	
7	MVV-133	17	27	37	
8	M-126	18	28	38	
9	M-127	19	29	39	
10	DUPLICATE	20	30	40	

Notes:	 	 	 

LDC #: 2104106 SDG #: 271121

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_\ of \\_\
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2nd reviewer: \\_\ \cdot\

All circled methods are applicable to each sample.

		Devenuetor
Sample ID	Matrix \	Parameter TOO ODE (CLO)
(-10	W	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Clo <sub>4</sub> )
	-	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
La Talka 11		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC#	21041D6
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## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

	Page:_	1	of_	7
	Reviewer:	V	4	?
2nd	Reviewer:	ţ		

Inorganics, Method See Cover

(DN NA DN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(< 30)		
Analyte	6	10	(≤ 30) RPD	
TDS	1482	1584	7	
Perchlorate (ug/L)	7410	9670	26	

V:\FIELD DUPLICATES\FD\_inorganic\21041D6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 28, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271325

Sample Identification

AA-01

AA-01DUP

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

## a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

## III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271325

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271325

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271325

No Sample Data Qualified in this SDG

SDG #	#: <u>21041E6</u> #:_ <u>271325</u> atory:_ <u>MWH Laboratories</u>		OITADI		PLETENI evel 2A	ESS WORK	SHEET	Date: 7 (9   Page:of Reviewer: 2nd Reviewer:
METH	HOD: (Analyte) Perchlor	rate (El	PA Metho	d 314.0), ¯	<u>ΓDS (EPA</u>	. Method 160.1	1 3M2540	o c 1
The savalida	amples listed below were ation findings worksheets.	review	red for ear	ch of the fo	ollowing va	alidation areas	s. Validation fi	indings are noted in attached
	Validation	Area_					Comment	ts
I.	Technical holding times			A	Sampling d	lates: 5 2	8 39	
Ila.	Initial calibration			N				
IIb.	Calibration verification			N				
111.	Blanks			A	<u></u>			
IV	Matrix Spike/Matrix Spike Du	uplicates	,	N	300	<i>~</i> /2		
V	Duplicates							
VI.	Laboratory control samples			_A_	LC21	LCSD		
VII.	Sample result verification		·····	N				
VIII.	Overall assessment of data							
IX.	Field duplicates			<del>\</del>				
Lx	Field blanks			l N	<u></u>			
Note:	Note: A = Acceptable ND = No compou N = Not provided/applicable R = Rinsate SW = See worksheet FB = Field blank			nsate	s detected	D = Dupl TB = Trip EB = Eq		
Validat	ted Samples:	ا سر	L _					
1	AA-01	11			21		31	
2	AA-01DUP	12			22		32	,
3	PB	13			23		33	5
4		14			24		34	
5		15			25		35	5

Notes:\_

LDC #: 2104166 SDG #: 271325

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: <u>\</u> of <u>\</u>	
Reviewer: 🔥 👤	
2nd reviewer:	

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
	W	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C13)
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
_ 2_	س	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<i>'</i>		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	· · · · · · · · · · · · · · · · · · ·	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO. NO. SO. PO. ALK CN: NH. TKN TOC CR6+
		pH TDS CLF NO. NO. SO. PO. ALK CN: NH. TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO. NO. SO, PO. ALK CN. NH. TKN TOC CR6+

Comments:	
	The state of the s

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 7, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270531

Sample Identification

M-10

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 300.0 for Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-10	Nitrate as N	7 days	48 hours	J- (all detects) R (all non-detects)	P

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270531

SDG	Sample	Analyte	Flag	A or P	Reason
270531	M-10	Nitrate as N	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270531

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270531

No Sample Data Qualified in this SDG

#### **VALIDATION COMPLETENESS WORKSHEET** LDC #: 21041F6 Level 2A SDG #: 270531

Page: \ of \ Reviewer: 2nd Reviewer: \_\_\_\_

Laboratory: I	MWH L	aboratori	ies
,			

METHOD: (Analyte) TDS (EPA Method 160.1), Nitrate-N (EPA Method 300.0) SM 25406)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Technical holding times	SW	Sampling dates: 5 7 09
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
111.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	4	? Ch. A Specified
V	Duplicates	1	\
VI.	Laboratory control samples	A	Les/Lesn
VII.	Sample result verification	N	,
VIII.	Overall assessment of data	<u> </u>	
IX.	Field duplicates	N	
X	Field blanks		

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

#### Validated Samples:

	AL	1 wish		
1	M-10	11	21	31
2	PB	12	22	32
3		13	23	33
4		14	24	34
5		15	25	35
6		16	26	36
7		17	27	37
8		18	28	38
9		19	29	39
10		20	30	40

Notes:				

LDC #: 21041 F6 SDG #: 270531

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: 4
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
(	W	PH (DS) CI F (NO3)NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
en e		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	*****	pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	
The state of the s	

LDC #: 21041F6 SDG #: 270531

## VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page: \_ of \_ Reviewer: \_ A \_ 2nd reviewer: \_

All circled dates have exceeded the technical holding time.

YN N/A Were all samples preserved as applicable to each method?

N N/A Were all cooler temperatures within validation criteria? 303.0 Method: NO:- N Parameters: 48 hrs Technical holding time: **Analysis** Sampling **Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier 5/14/09 J- R P (L) ١ 1005 1757

## Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 12, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270704

## Sample Identification

PC-91

PC-91MS PC-91MSD

PC-86

PC-90

PC-103

MW-K5

PC-56

PC-68

PC-60

PC-58

PC-62

PC-59

PC-98R

MW-K4 ARP-7

M-87

PC-97

ARP-6B

ARP-5A

ARP-4A

PC-53

## Introduction

This data review covers 22 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA Method 353.2 for Nitrate/Nitrite as Nitrogen, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

## a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

## IV. 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.

## V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270704

No Sample Data Qualified in this SDG

SDG # Labora	t: <u>21041G6</u> #: <u>270704</u> atory: <u>MWH Laboratories</u>	<u>.                                    </u>	LIDATION	L	_evel	I 2A				Date: 7 (4) Page: of Reviewer: 2nd Reviewer:
<b>MET</b> H 9056)	OD: (Analyte) Perchlor	ate (E	EPA Method	314.0), T MALJ	<u>DS (E</u>	<u>EPA N</u>	Method 160	0.1), Ch	اlorate, Nitrate احتط ه د /	-N (EPA SW846 Metho
The sa	amples listed below were tion findings worksheets.	revie								
	Validation	Area							Comments	
1.	Technical holding times			A	Samp	pling d	lates: 5	12	09	
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
III.	Blanks			Α						
IV	Matrix Spike/Matrix Spike Du	uplicat	es	Α	17,	N2	(MSD			
V	Duplicates			N						
VI.	Laboratory control samples			Α	ILC	3 1	LCSD			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			А						
IX.	Field duplicates			N			-			
X	Field blanks			7						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<u> </u>	R = Rins	o compound sate eld blank	is dete	cted	TB =	ouplicate Trip blar Equipm		
Validate	ed Samples:	یو پ	h							
1	PC-91 ·	11	PC-59			21	PC-91MS		31	
	PC-86	12	PC-98R			22	PC-91MSD		32	
	PC-90	13	MW-BK K-4			23	7B		33	
	PC-103	14	ARP-7	<u> </u>		24			34	
	MW-K5	15	M-87			25			35	
6	PC-56	16	PC-97			26			36	
7	PC-68	17	ARP-6B			27			37	
8	PC-60	18	ARP-5A			28			38	
	PC 59	10	ΔΡΡ./Δ			20			39	

Notes:	 

PC-53

30

40

PC-62

LDC #: 2104196 SDG #: 275754

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	<u> Matrix</u>	Parameter — — — — — — — — — — — — — — — — — — —
6-20	W	pH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C104)
		pH (FD) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1, 4	w	pH (fDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (いつ) (いつ) (いつ)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2-3 5		PH (TDS) CI F (NO3) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+(C104) (C105)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
21.22	لب	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN- NH <sub>3</sub> TKN TOC CR <sup>6+</sup> Clou
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:	 	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 13, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270794

## Sample Identification

PC-101R

PC-18

PC-55

ARP-1

L-635

PC-92

PC-122

PC-92DUP

#### Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270794

No Sample Data Qualified in this SDG

SDG#	:: 21041H6 #: 270794 atory: MWH Laboratories		LIDATIO		PLET evel		ESS WOF	RKSH	IEET		Date: 19 09 Page: of 1 Reviewer: 41 2nd Reviewer:
The sa	OD: (Analyte) Perchlo amples listed below were tion findings worksheets.	revie						<u> </u>			lings are noted in attached
	Validation	Area							Commer	nts_	
I.	Technical holding times			Δ	Samp	lina d	ates: ऽ (	13	29		
IIa.	Initial calibration			N							
IIb.	Calibration verification			N							
111.	Blanks		***************************************	A							
IV	Matrix Spike/Matrix Spike D	uplicate	es	N	7 :	<u>ک</u> م	ى ئ				
v	Duplicates			Δ	\		1				
VI.	Laboratory control samples			Α	Lc	ا د ـ	LCOD				
VII.	Sample result verification		·	N							
VIII.	Overall assessment of data			A							
IX.	Field duplicates			7							
X	Field blanks			l i							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	s detec	ted	TB = '	uplicate Trip blar Equipme			
Validate	ed Samples:	. ۰۸	بلد:								
1	PC-101R	11				21			3	1	
li i	PC-18	12				22			3:	2	
	PC-55	13				23			3:	3	
	ARP-1	14				24			3-	4	
	L-635	15				25			3:	5	
	PC-92	16				26			30	6	

10	20	30	40
Notes:			
			· · · · · · · · · · · · · · · · · · ·

PC-122

PB

PC-92DUP

LDC #:<u>21041H</u>6 SDG #:<u>27079</u>4

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

		Matrix	<b>D</b>
San	nple ID	<u>Matrix</u>	Parameter Parameter
	-7	W	PH (TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C124)
<u> </u>			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
u	8	س	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 14, 2009

**LDC Report Date:** 

July 24, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270845

Sample Identification

H-58A

H-48

MC-65

PC-21A

MC-6

MC-7

MC-69

## Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
H-58A H-48 MC-65 PC-21A MC-6 MC-7 MC-69	Total dissolved solids	23 days	7 days	J- (all detects) R (all non-detects)	P

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

### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

## b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270845

SDG	Sample	Analyte	Flag	A or P	Reason
270845	H-58A H-48 MC-65 PC-21A MC-6 MC-7 MC-69	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270845

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270845

No Sample Data Qualified in this SDG

SDG	#:21041I6 #:_270845 ratory:_MWH_Laboratorie		LIDATIOI		PLETENE ∟evel 2A	ESS WORKSHI	ΞET	Date: →   9   0  Page: _ · of _ ·  Reviewer: _ A /  2nd Reviewer: ·	
METI 9056)	HOD: (Analyte) Perchic	orate (E	EPA Method	l 314.0), T	DS (EPA N	Method 160.1, Chlo	orate, Nitrate- ય ∘ ૬ ો	N (EPA SW846 Method	
	amples listed below wer ation findings worksheets		wed for ea	ch of the f	ollowing va	alidation areas. Val	idation finding	_ gs are noted in attached	
	Validation	n Area				C	omments		
I.	Technical holding times			> ಬ	Sampling d	ates: 5   14 (	)q		
lla.	Initial calibration			N					
Ilb.	Calibration verification			N					
111.	Blanks			A					
IV	Matrix Spike/Matrix Spike I	Duplicate	es	~	Rem	+ Specified			
٧	Duplicates			$\sim$					
VI.	Laboratory control samples	3		_A	LC3 / LC50				
VII.	Sample result verification			N					
VIII.	Overall assessment of data	a		A					
IX.	Field duplicates			N					
L <sub>X</sub>	Field blanks			$\nu$					
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le	R = Rin	o compound sate eld blank	ls detected	D = Duplicate TB = Trip blank EB = Equipme			
Validat	ted Samples:	<u>u</u> ~	سلم						
1	H-58A	11			21		31		
2	H-48	12			22	***************************************	32		
3	MC-65	13			23		33		
4	PC-21 <b>A</b> .	14			24		34		
5	MC-6	15			25		35		
6	MC-7	16			26		36		
7	MC-69	17			27		37		
8	128	18			28		38		
9		19			29		39		
10		20			30		40		
Notes	<b>S</b> :								

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# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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Reviewer: \\_A\\_
2nd reviewer: \\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
1-3,	W	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ (C104)
2-7		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
Ц	(~)	pH (DS) CI F (NO) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CIO4) (CIO5)
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 21041 I 6 SDG#: 270845

## **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:	<u>of</u>
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All circled dates have exceeded the technical holding time.

Were all samples preserved as applicable to each method?

N/A Were all cooler temperatures within validation criteria? 160.1 5h 2540c Method: Parameters: tDS 7 days Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** date Sample ID date date date date date Qualifier J-1217 (W) 2/14/09 23 200 5) 1-7

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 19, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270989

Sample Identification

FB0151909

HSS

EB051909

FB051909-2

PC-82

#### Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB051909 was identified as an equipment blank. No contaminant concentrations were found in this blank.

Samples FB0151909 and FB051909-2 and sample FB M-39 (from SDG 270992) were identified as field blanks. No contaminant concentrations were found in these blanks.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270989

No Sample Data Qualified in this SDG

SDG 7	#: <u>21041J6</u> #:_ <u>270989</u> atory: <u>MWH Laboratories</u>	LIDATIO		PLETENESS ∟evel 2A	S WORKSH	IEET	Date: ユレーシュ Page: Lof Reviewer: ユム 2nd Reviewer:	
		ate (	EPA Method	314.0), T	DS (EPA Meth	nod 160.1, Cł	nlorate, Nitra	te-N (EPA SW846 Method
9056)					· .	zw.	234061	
	amples listed below were tion findings worksheets.		ewed for ea	ch of the f	ollowing valida	ation areas. V	alidation find	lings are noted in attached
	Validation	Area					Comments	
l.	Technical holding times				Sampling dates:	5/19	109	
lla.	Initial calibration			N				
IIb.	Calibration verification			N				
111.	Blanks			A				
IV	Matrix Spike/Matrix Spike Di	uplicat	es	٦	3 C1:-+	Dp-if:	A	
V	Duplicates			N		:		
VI.	Laboratory control samples			A	Lasta	CSD		
VII.	Sample result verification			N				
VIII.	Overall assessment of data			Δ				
IX.	Field duplicates			N				
Lx	Field blanks			120	EB: 3	FB: 1	4 FB	M-39 (fm 271)99
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	,	R = Rin	o compound sate eld blank	ls detected	D = Duplicate TB = Trip bla EB = Equipm	nk	
Validate	ed Samples:	<u>~</u> L	<b>L</b>					
1	FB0151909	11			21		31	
2	HSS	12			22		32	
3	EB051909	13			23		33	
	FB051909-2	14			24		34	
5	PC-82 ·	15			25		35	
6	PB	16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39	
10		20			30		40	
Notes	:							

LDC#: 2104136 SDG#: 270989

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \ of \
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2nd reviewer: \ \ \

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parame
2-3	$\omega$	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> CIO <sub>4</sub>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1,4	W	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
5	لب	PH (TDS CI F NO3) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CI) (C())
		ph tds ci f No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> Alk cn <sup>-</sup> Nh <sub>3</sub> Tkn toc cr <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	,	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
. 5.7.		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN-NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN-NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN-NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:			
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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 19, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270992

Sample Identification

M-39

FB M-39

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA Method 353.2 for Nitrate/Nitrite as Nitrogen, and EPA SW 846 Method 9056 for Chlorate and Nitrate as Nitrogen.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P	
M-39	Total dissolved solids	14 days	7 days	J- (all detects) UJ (all non-detects)	Р	

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Samples FB0151909 and FB051909-2 (both from SDG 270989) and FB M-39 were identified as field blanks. No contaminant concentrations were found in these blanks.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270992

SDG	Sample	Analyte	Flag	A or P	Reason
270992	M-39	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270992

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 270992

No Sample Data Qualified in this SDG

LDC #:21041K6V SDG #:_270992 Laboratory: <u>MWH Laboratories</u>			VALIDATION COMPLETENESS WORKSHEET Level 2A					Date: 국 la l əq Page: _ of _ Reviewer: _ <u>a l</u> 2nd Reviewer:		
056)	N:1- + N:+:+ a	لمو	(EIA a	1 ethal	<u>38</u> 3.2)	SM 2540C	\	ate-N (EPA SW846 Method		
	imples listed below were ion findings worksheets.	revie	wed for ea	ch of the f	ollowing v	alidation areas. Validatio	n find	dings are noted in attached		
	Validation	Area				Comm	ents			
1.	Technical holding times			SW	Sampling of	lates: 5   19   09				
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
III.	Blanks			Α	<u> </u>					
IV	Matrix Spike/Matrix Spike Du	ıplicate	es .	2	1 61	· A Spected				
٧	Duplicates			7	)					
VI.	Laboratory control samples			Δ	LLSI	600				
VII.	Sample result verification			N						
VIII.	Overall assessment of data									
IX.	Field duplicates		***	2		*	H:	(0		
х	Field blanks			120	FB:	2, FB0151909	FB	051909-2 (fra 27		
ote:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	ls detected	D = Duplicate TB = Trip blank EB = Equipment blan	k			
lidate	d Samples:	w	<u> </u>							
	M-39 '	11			21		31			
	FB M-39	12			22		32			
	PB	13			23		33			
		14			24		34			
		15			25		35			
		16			26		36			
		17			27		37			
		18			28		38			
		19			29		39			
		20			30		40			

LDC #: 21041K6 SDG #: 22092

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
(	W	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR CO3 (CO3) (NO3/NO
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2	لب	PH (DS) CI F (NO) NO2 SO4 PO4 ALK CN' NH3 TKN TOC CRE (CIO) (CIOS)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
· · · · · · · · · · · · · · · · · · ·		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN-NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLE NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	
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LDC #: 210 41 K6 SDG #: 270992

## **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

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All circled dates have exceeded the technical holding time.

YN N/A

Were all samples preserved as applicable to each method?

Y) N N/A Were all cooler temperatures within validation criteria? 25402 Method: 160.1 Parameters: Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** Sample ID date date date date date date Qualifier J-/41/P (L) 5/19/29 (14 da 1

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 22, 2009

**LDC Report Date:** 

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271160

Sample Identification

M-125

M-128

M-124

FB052209

M-123

**DUPLICATE** 

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB052209 was identified as a field blank. No contaminant concentrations were found in this blank.

### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples M-125 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	Concentration					
Analyte	M-125	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	14700 mg/L	15400 mg/L	5 (≤30)	-	-	-	
Perchlorate	842 ug/L	812 ug/L	4 (≤30)	-	-	-	

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271160

No Sample Data Qualified in this SDG

LDC #: 21041L6 VALIDATION COMPLETENESS WO SDG #: 271160 Level 2A Laboratory: MWH Laboratories								KSHEET	•	Date: ¬   A   Page: of Reviewer: ✓ 2nd Reviewer: _ ✓
METH	OD: (Analyte) Perchlo	rate (	(EPA Metho	od 314.0),	TDS (	EPA	Method 160	.1 su ×	540	
	amples listed below were ion findings worksheets.		ewed for ea	nch of the f	ollowi	ng va	alidation area	as. Validatio	on find	dings are noted in attached
	Validation	Area						Comn	nents	
I.	Technical holding times			A	Samp	ling d	ates: ऽ / 2	2109	(	
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			A						
IV	Matrix Spike/Matrix Spike D	uplicat	es	2	Chant Sprifted					
٧	Duplicates			7						
VI.	Laboratory control samples			A	LC	_ \	LCSD			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			ىسى	1):1+6					
_X	Field blanks			20	FE	\$ = <b>\$</b>	٦			
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	lo compound isate ield blank	ls detec	ted		plicate rip blank quipment blar	nk	
'alidate	ed Samples:	Ĺ	u L							
1	M-125	11				21			31	
	M-128	12				22			32	
	M-124	13				23			33	
	FB052209	14				24			34	
	M-123	15				25			35	
	DUPLICATE "	16				26			36	
	PB	17				27			37	
8		18				28			38	


Notes:\_

LDC #: <u>2204146</u> SDG #: <u>23116</u>0

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

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All circled methods are applicable to each sample.

Sample ID	<u>Matrix</u>	<u>Parameter</u>
1-6	W	PH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C134)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
:		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO, NO, SO, PO, ALK CN- NH, TKN TOC CR <sup>6+</sup>

Comments:	

LDC#	21041L6
SDG#:	See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page:_a	_of	1
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Inorganics,	Method	See	Cover

AN NKY

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(< 20)		
Analyte	1	6	( <u>&lt;</u> 30) RPD	
TDS	14700	15400	5	
Perchlorate (ug/L)	842	812	4	

V:\FIELD DUPLICATES\FD\_inorganic\21041L6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 26, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271248

Sample Identification

HM-2

M-111A

FB052609

M-142

EB052609

**DUPLICATE** 

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB052609 was identified as an equipment blank. No contaminant concentrations were found in this blank.

Sample FB052609 was identified as a field blank. No contaminant concentrations were found in this blank.

## IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

### VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples M-142 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration					
Analyte	M-142	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	2938 mg/L	2814 mg/L	5 (≤30)	-	-	•
Perchlorate	24700 ug/L	24800 ug/L	0 (≤30)	-	-	•

## 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271248

No Sample Data Qualified in this SDG

SDG # Labora	#:21041M6 #:_271248 ratory:_MWH_Laboratories HOD: (Analyte)Perchlo	<u> </u>		L	_evel 2A	1		Date: ¬ (¬ ) .  Page: _ of  Reviewer: _ △ .  2nd Reviewer: _ ( )
	amples listed below were tion findings worksheets.		ewed for ear	ch of the fo	ollowing v	alidation areas. Valid	ation findir	ngs are noted in attached
	Validation	Area				Cor	nments	
I.	Technical holding times			A	Sampling d	dates: 5 2 6	09	
lla.	Initial calibration			N		_		
IIb.	Calibration verification			N				
111.	Blanks			A				
IV	Matrix Spike/Matrix Spike Di	uplicat	es	N	7 C1:	ent Specified		
V	Duplicates			* 7		ı		
VI.	Laboratory control samples			A	LCS	LUSA		
VII.	Sample result verification			N	`			
VIII.	Overall assessment of data			A				
IX.	Field duplicates			SW	, : Ci	4+6		
L <sub>X</sub>	Field blanks			170	FB:3	EB:5		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<b>)</b>	R = Rins	lo compound sate ield blank	s detected	D = Duplicate TB = Trip blank EB = Equipment l	blank	
Validate	ed Samples:	u_	wed_					
1	HM-2	11			21		31	
	M-111A	12			22		32	
	FB052609	13			23		33	
4	M-142	14			24		34	
	ER052609	15			25		35	

10 20 30 40 Notes:

DUPLICATE 5

PB

 LDC #: 21041MC SDG #: 211248

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_of \\
Reviewer: \_A\_\_\_
2nd reviewer: \_(\(\triangle)\)

All circled methods are applicable to each sample.

Sample ID	Matrix	<u>Parameter</u>
1-0	W	PH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ (C13)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	-	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	-	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:		

LDC# <u>210</u> SDG#: <u>See</u>		Page: \_of_\ Reviewer: \_A 2nd Reviewer:
Inorganics,	Method_See Cover	
<u> </u>	Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?	

	Concentration (mg/L)		(< 30)	
Analyte	4	6	(≤ 30) RPD	
TDS	2938	2814	4	
Perchlorate (ug/L)	24700	24800	0	

V:\FIELD DUPLICATES\FD\_inorganic\21041M6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 1, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271400

# Sample Identification

TR-11

TR-12

TR-1

TR-10

FB060109

M-103

M-117

M-118

DUPLICATE

TR-12MS

TR-12MSD

#### Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB060109 was identified as a field blank. No contaminant concentrations were found in this blank.

## IV. 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.

## V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples M-103 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration						
Analyte	M-103	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	1970 mg/L	2000 mg/L	2 (≤30)	-	-	-	
Perchlorate	264 ug/L	260 ug/L	2 (≤30)	-	-	-	

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271400

No Sample Data Qualified in this SDG

SDG#	:21041N6 <del>:</del> : <u>271400</u> atory: <u>MWH Laboratorie</u>	<del></del>	LIDATION		PLETE _evel 2		SS WOR	KSHEET		Date: ユ   ۹   ۵ Page: _ of _ Reviewer: _ Δ _ 2nd Reviewer:
METH	OD: (Analyte) Perchl	lorate (I	EPA Metho	d 314.0), 7	TDS (EI	<u>PA N</u>	/lethod 160	Nitrate-I). 1), Nitrate-I		PA Method 300.0)
	amples listed below weltion findings worksheets		wed for each	ch of the fo	ollowing	g vali	idation area	as. Validatio	n find	lings are noted in attached
	Validation	n Area						Comm	ents	
1.	Technical holding times			A	Samplin	ng dat	tes: 6	1/09		
IIa.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			A	<u> </u>					
IV	Matrix Spike/Matrix Spike	Duplicate	es	A	14~	<u>15</u>	(MSD			
V	Duplicates			N	1)		-			
VI.	Laboratory control sample	es		A	LC	5/	4680			
VII.	Sample result verification	J		N						
VIII.	Overall assessment of dat	ıta		Δ						
IX.	Field duplicates			SW			, + 9			
_x_	Field blanks			120	FR	2:2	<u> </u>			
Note:	A = Acceptable N = Not provided/applicat SW = See worksheet	ble	R = Rin	No compound nsate ïeld blank	is detecte	ed	TB = T	uplicate Frip blank Equipment blan	k	
Validate	ed Samples:	l wel	<u> </u>							
1	TR-11 ·		TR-12MSD		2	21			31	
	TR-12 '	12	PB		2	22			32	
	TR-1	13			2	23			33	
	TR-10 ·	14			2	24			34	
	FB060109	15			2	25			35	
	M-103 S	16			2	26			36	

1	TR-11 ·	11	TR-12MSD	21	 31	
2	TR-12	12	PB	22	32	
3	TR-1	13		23	33	
4	TR-10 ·	14		24	34	
5	FB060109	15		25	35	
6	M-103 <sup>C</sup>	16		26	36	
7	M-117	17		27	37	
8	M-118	18		28	38	
9	DUPLICATE 5	19		29	39	
10	TR-12MS	20		30	40	

Notes:	

LDC #: 21041 N6 SDG #: 271700

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	
1-9		Parameter Parameter
	W	pH (TD\$ CI F (NO) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CIO3)
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
10-11	$\omega$	pH TDS CI F (NO3) NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
•		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	<u></u>	pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

LDC# <u>210</u> SDG#: <u>See</u>		VALIDATION FINDINGS WORKSHEET Field Duplicates	Page:_\_of_ Reviewer:\2nd Reviewer:\
Inorganics,	Method See Cover	industrial Control	<u></u>
<u>(YN NA</u> (YN NA		e pairs identified in this SDG? es detected in the field duplicate pairs?	

	Concentra	(z 30)		
Analyte	6	9	( <u>&lt;</u> 30) RPD	
TDS	1970	2000	2	
Perchlorate (ug/L)	264	260	2	

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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 2, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271465

Sample Identification

M-121

M-120

FB060209

TR-4

**DUPLICATE** 

**DUPLICATEDUP** 

#### Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB060209 was identified as a field blank. No contaminant concentrations were found in this blank.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples TR-4 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)				A or P	
Analyte	TR-4	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag		
Total dissolved solids	874	888	2 (≤30)	-	-	-	

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271465

No Sample Data Qualified in this SDG

SDG#	#:21041O6 #:_271465 atory:_MWH Laborato		LIDATIOI		PLETE Level 2		SS WORKS	HEET	Date: ユ (۹ ). Page: ハ of ハ Reviewer: △ハ 2nd Reviewer: レー
METH	HOD: (Analyte) Perc	chlorate (	EPA Metho	d 314.0), T	TDS (E	PA	Method 160.1)	Nitrate-N (EP วิณะรนจะ)	A Method 300.0)
	amples listed below w tion findings workshe		wed for ea	ch of the fo	ollowing	g va	lidation areas. \	/alidation find	lings are noted in attached
	Validati	ion Area						Comments	
<u>l.</u>	Technical holding times	3			Samplir	ng da	ates: C / 2	109	
lla.	Initial calibration			N					
IIb.	Calibration verification			N					
111.	Blanks				<u> </u>				
IV	Matrix Spike/Matrix Spik	ke Duplicat	es	N	} Dap				
V	Duplicates			A					
VI.	Laboratory control samp	ples			LCS	s l a	LLST		
VII.	Sample result verification	on		N					
VIII.	Overall assessment of o	data		A					
IX.	Field duplicates			5w	D	= 4	1+2		
_x_	Field blanks			112	FB	<u> </u>	3		
Note:	A = Acceptable N = Not provided/applic SW = See worksheet	cable	R = Rin	lo compound nsate ield blank	is detecte	ed	D = Duplica TB = Trip bl EB = Equip	lank	
Validat	ted Samples:	<u>د. ب</u>							
1	M-121	11			2	21		31	
2	M-120	12			2	22		32	
3	FB060209	13			2	23		33	
4	TR-4	. 14				24		34	
5	DUPLICATE	15				25		35	
6	DUPLICATEDUP	16				26		36	
7	PR	17				27		37	

9	19	29	39	
10	20	30	40	
Notes:				

18

LDC #: 2104106 SDG #: 271465

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_of \\_\
Reviewer: \_A \_\_\_
2nd reviewer: \_\[ \ldots \\_

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
	1-3,5	W	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (CIO <sub>4</sub> )
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	ч	<u> </u>	PH (TDS) CI F (NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C104)
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
4	6	w	pH (DS)CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
.			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			PH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			PH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	. 6.7.		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+
			ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
I			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
I			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ľ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\  \cdot \ $			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ľ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+


LDC#	2104106
SDG#:	See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page: <u> </u>	1
Reviewer:	
2nd Reviewer:	_

Inorganics, Method See Cover

OYN NA (YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(4 20)		
Analyte	4	5	( <u>&lt;</u> 30) RPD	
TDS	874	888	2	

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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 4, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271624

Sample Identification

TR-3

H-11

FB060409

**DUPLICATE** 

#### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB060409 was identified as a field blank. No contaminant concentrations were found in this blank.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples H-11 and DUPLICATE were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Concentrati		tion (mg/L)		D		
Analyte	H-11	DUPLICATE	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	634	520	20 (≤30)	•	-	-

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271624

No Sample Data Qualified in this SDG

SDG	#:21041P6 #:_271624 atory:_MWH_Laboratories	VALIDATIO		PLETENI evel 2A	ESS WOR		Date: عـ ام ( Page: ١ of ١ Reviewer: عـ ح 2nd Reviewer: ا
METI	HOD: (Analyte) Perchic	rate (EPA Metho	od 314.0),	TDS (EPA	Method 160.	1), Nitrate-N (EPA N	Method 300.0)
	amples listed below were tion findings worksheets		ich of the fo	ollowing v	alidation area	s. Validation findings	s are noted in attached
	Validation	Area				Comments	
ı.	Technical holding times		A	Sampling of	lates: 6	4 109	
lla.	Initial calibration		N				
IIb.	Calibration verification		N				
III.	Blanks		Α				
IV	Matrix Spike/Matrix Spike D	uplicates	<b>\</b>	] C1:	~ + Spen	(: d	
V	Duplicates		N				
VI.	Laboratory control samples		A	LCS	LC 50		
VII.	Sample result verification		N				
VIII.	Overall assessment of data		4				
IX.	Field duplicates		SW	D = 2	-+4		
L <sub>X</sub>	Field blanks		72	FB:	3		
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	e R = Rir	lo compound: sate ield blank	s detected	D = Dup TB = Tri EB = Ec		
	&v	_ ~ <u>~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~</u>	· .			I	
1	TR-3	11		21		31	
2	M-11-11	12		22		32	
3	FB060409	13		23		33	
4	DUPLICATE )	14		24		34	
5	PB	15		25		35	
6		16		26		36	
6 7 8		18		27		37	

Notes:\_

LDC #: 21041P6 SDG #: 271624

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_of\_\\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
\	W	pH (TD\$ CI F(NO3)NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C10)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2-4	ω)	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C134)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	,	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1000		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN' NH, TKN TOC CR6+

Comments:

LDC# _210 SDG#: <u>See (</u>		Page: of Reviewer:
Inorganics,	Method_See Cover	
ŶN NA ŶN NA	Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?	

	Concentra	(< 30)		
Analyte	2	4	(≤ 30) RPD	
TDS	634	520	20	

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# Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 7, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270567

# Sample Identification

M-87

M-70

M-71

M-72

M-38

M-36

M-84

M-100

M-10

MD-2

M-22A M-89

#### Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, EPA Method 353.2 for Nitrate/Nitrite as Nitrogen, EPA SW 846 Method 7196 for Hexavalent Chromium, and EPA SW 846 Method 9056 for Chlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-36 MD-2	Hexavalent chromium	32.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-84	Hexavalent chromium	32.75 hours	24 hours	J- (all detects) UJ (all non-detects)	P
M-100	Hexavalent chromium	33 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-10	Hexavalent chromium	31.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-36 M-10 MD-2	Nitrate/Nitrite as N	43 days	28 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

## III. Blanks

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

No field blanks were identified in this SDG.

### IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

## VI. Laboratory Control Samples

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

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples M-36 and MD-2 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration					
Analyte	M-36	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
Chlorate	7040000 ug/L	7420000 ug/L	5 (≤30)	-	-	•
Perchlorate	1560000 ug/L	1450000 ug/L	7 (≤30)	-	-	-
Hexavalent chromium	35.0 mg/L	35.0 mg/L	0 (≤30)	-	-	-
Nitrate/Nitrite as N	52.7 mg/L	51.4 mg/L	2 (≤30)	-	-	-
Total dissolved solids	11700 mg/L	11900 mg/L	2 (≤30)	-	-	•

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270567

SDG	Sample	Analyte	Flag	A or P	Reason
270567	M-36 M-84 M-100 M-10 MD-2	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times
270567 M-36 N M-10 MD-2		Nitrate/Nitrite as N	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270567

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270567

No Sample Data Qualified in this SDG

SDG	#:21041Q6 #: <u>270567</u> ratory: <u>MWH Laboratories</u>		ALIDATIO		PLETI ₋evel		ESS WORKSHEET		Date: ٦ (م / Page: ر of ر Reviewer: عمر 2nd Reviewer: ر	
N	trate/Nitrite-N (EPA Meth	od 35	53.2) (RV	E Sw7	7194	<u> </u>	7. Sm254	ەد	PA SW846 Method 9056)	
	samples listed below were ation findings worksheets.		ewed for ea	ch of the fo	ollowir	ng va	alidation areas. Validation	on tind	dings are noted in attached	
	Validation	Area			Comments					
1.	Technical holding times				Sampl	Sampling dates: S 1 7 1 9 9				
lla.	Initial calibration			N						
IIb.				N						
III.	Blanks			Α						
IV	Matrix Spike/Matrix Spike Di	uplicat	es	N	Clint Specified					
<u></u>	Duplicates	Duplicates								
VI.	Laboratory control samples			Α	LCS					
VII.	Sample result verification			N						
VIII	Overall assessment of data			Α						
IX.	Field duplicates			50	D: 6+13					
Lx	Field blanks		·	<u> </u>		<del></del>	######################################			
Note:	N = Not provided/applicable R = Rins			o compounds detected D = Duplicate sate TB = Trip blank eld blank EB = Equipment blank						
Valida	ted Samples:	<u> </u>	<u>.                                    </u>				-			
1	M-87	11	M-22A		- 2	21		31		
2	M-70	12	M-89			22		32		
3	M-71	13	PB			23		33		
4	M-72	14				24		34		
5	M-38	15				25		35	***************************************	
6	M-36 .	16				26	·	36		
7	M-84	17				27		37		
8	M-100	18				28		38		
9	M-10	19				29		39		
10	MT MD-20.	20			;	30		40		
Notes	S:									

LDC #:2104136 SDG #:270563

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_\ of \\_\
Reviewer: \\_A \\_\
2nd reviewer: \\_\_\

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
1-5,11,	W	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (CIO4)
12		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
6.9-10	W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC (RB) (C10) (C10) (NO3 NO2)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
J-8	<del>ا</del> ل	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC (R6+)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
S. 1. 1. 1.		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+

Comments:	

LDC #: 21041 24 SDG #: 2705 67

## VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page:_	ţ	_of_	1
Reviewer:	_	ا م	
2nd reviewer:		$\overline{\lambda}$	/

All circled dates have exceeded the technical holding time.

Y) N N/A Were all cooler temperatures within validation criteria? Method: 7196 353.2 Cr4+ NO3/NOJ-N Parameters: 28 days 24 hrs Technical holding time: Sampling **Analysis** Analysis **Analysis Analysis Analysis** Sample ID date date date date date date Qualifier 5/7/09/5/8/09 (32.5 hus) J-/45/P (4) 0846 1718 7 2171 5/8/09 ٥٩ (32.75 hrs) 2510 1718 5/7/09 5 /8/09 δ (33 hrs 0815 1718 9 5/8/09 5 7 09 (31.25 1718 1005 10 5/7/09 5/8/09 (32.5h 1718 0846 6/19/09 801712 (43 days) 7-143 P (h) 6.9-10

LDC#	21041Q6
SDG#	See Cover

# **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page:_	<u>of</u>	1
Reviewer:	4	و
2nd Reviewer:	V	

Inorganics, Method See Cover

() N NA (Y)N NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	Concentration (mg/L)				
Analyte	6	10	(≤ 30) RPD			
Chlorate (ug/L)	7040000	7420000	5			
Perchlorate (ug/L)	1560000	1450000	7			
Hexavalent Chromium	35.0	35.0	0			
Nitrate/Nitrite as N	52.7	51.4	2			
TDS	11700	11900	2			

V:\FIELD DUPLICATES\FD\_inorganic\21041Q6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 29, 2009

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271337

# Sample Identification

TR-2

TR-5

TR-6

TR-7

FB052909

TR-9

**TR-8** 

TR-2MS

TR-2MSD

# Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

Sample FB052909 was identified as a field blank. No contaminant concentrations were found in this blank.

# IV. 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.

# V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271337

No Sample Data Qualified in this SDG

_DC #:21041R6 VALIDATION COMPLETENESS WORKSHEET  EDG #: _271337								Date: ¬   a   a Page: \ of \ Reviewer: \ \ 2nd Reviewer: \		
METH	HOD: (Analyte) Perchlora	ate (E	PA Method	<u>1 314.0), T</u>	TDS (EP	A Meth	od 16	0.1, Nit	trate-N (EP/	4 Method 300.0)
The sa	amples listed below were tion findings worksheets.	revie	wed for eac	ch of the fo	ollowing	validati	on are	eas. Vali	idation findi	ngs are noted in attached
	Validation A	Ar <u>ea</u>						C	omments	
I.	Technical holding times			A	Sampling	dates:	5	29	109	
IIa.	Initial calibration			N						
Ilb.	Calibration verification			N						
111.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike Du	uplicate	es	Δ	Ru	SIN	150	)		
V	Duplicates			N		•				
VI.	Laboratory control samples			Α	Las	100	20			
VII.	Sample result verification			N		T				
VIII.				A						
IX.	Field duplicates			2			-			
_ <u>x_</u>	Field blanks			20	FB:	<u> </u>				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	1	R = Rin	lo compound sate ield blank	is detected		TB =	Duplicate Trip blant Equipme		
Validat	ted Samples:	, ,								
		11			21			<u> </u>	31	
	TR-2	12			22				32	
2	TR-5	13			23				33	
3	TR-6	13			24				34	
5	FB052909	15			25				35	
6	TR-9	16			26				36	
7		17			27				37	
	TR-8	18			28				38	
8	TR 2MSD	10			29		,		39	

Notes:

LDC #: 2104186 SDG #: 271337

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

		Matrix	Parameter
	mple ID		
1-	4.6-7	<u> </u>	pH TD\$ CI F (NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C104)
-	5		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-	3	W	pH (DS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C LO <sub>4</sub> )
عد ۶	<del>}</del>	. \	pH TDS CL F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	9 7 -	$\omega$	pH TDS CI F (NO <sub>3</sub> ) NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO. NO. SO. PO. ALK CN: NH. TKN TOC CR6+
			pH TDS CLE NO. NO. SO. PO. ALK CN: NH. TKN TOC CR <sup>6+</sup>
			pH TDS CLE NO. NO. SO. PO. ALK CN: NH. TKN TOC CR <sup>6+</sup>
╟			pH TDS CLE NO. NO. SO. PO. ALK CN: NH. TKN TOC CR <sup>6+</sup>
			pH TDS CLE NO. NO. SO. PO. ALK CN: NH. TKN TOC CR <sup>6+</sup>
			pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
-			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+  pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			ph TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<b>I</b>			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO. NO. SO, PO, ALK CN. NH. TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 8, 2009

LDC Report Date:

July 28, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271731

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

### Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

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

## b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

All sample result verifications were acceptable.

### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271731

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271731

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 271731

No Sample Data Qualified in this SDG

SDG Labo	LDC #: 21041S6 VALIDATION COMPLETENESS WORKSHEET  SDG #: 271731 Level 4 Laboratory: MWH Laboratories							Date: 7/-) Page:(of_) Reviewer: 2nd Reviewer:	
MET	HOD: (Analyte) Perchlo	rate (	(EPA Metho	d 314.0),	TDS (	<u>EPA</u>	Method 160.1)	ISM muc	<del></del>
	samples listed below were ation findings worksheets.		ewed for ead	ch of the f	followir	ng va	alidation areas.	Validation finding	— gs are noted in attached
	Validation	Area						Comments	
I.	Technical holding times			A	Sampl	ling d	ates: 6/8/	29	
lla.	Initial calibration			A				<i>1</i>	
Ilb.	Calibration verification			A					
111.	Blanks			A,			~		
IV	Matrix Spike/Matrix Spike D	uplicat	tes	N	1	es/c	- chat	specified	
V	Duplicates			A	<b>b</b> -	mp',	fun Soy 2	specifical	
VI.	Laboratory control samples			À	L	15/1		<del>'                                    </del>	
VII.				A					
VIII	. Overall assessment of data			A					
IX.	Field duplicates			N,					
x	Field blanks			M					
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet  ted Samples:	<b>)</b>	R = Rins	o compound sate eld blank	is detec	ted:	D = Duplica TB = Trip b EB = Equip		
<b>1</b>	ART-1	11	SF-1			21	10	31	<del></del>
2	ART-2	12	PC-117			22	MB	32	
3	ART-3	13	PC-118			23		33	
4	ART-4	14	PC-119			24		34	
5	ART-6	15	PC-120			25		35	
6	ART-7	16	PC-121			26		36	
7	ART-8	17	PC-133			27		37	
8	PC-99R2/R3	18	ART-9			28		38	
9	PC-115R	19				29		39	

Notes:_				
	 	 	<del></del>	

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PC-116R

# **VALIDATION FINDINGS CHECKLIST**

Page: 1 of 1 Reviewer: 1 MM 2nd Reviewer: 2

Method:Inorganics (EPA Method ) LC (M)			r	
Validation Area	Yes	No	NA	Findings/Comments
Carolynes hotters brees		713	1/2	<b>建设设置的</b>
All technical holding times were met.	1			
Cooler temperature criteria was met.				
Cooler temperature distance was me.				
	/			
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients > 0.995?				
Were all initial and continuing calibration verification %Rs within the 93-116% QC limits?	/			
Were titrant checks performed as required? (Level IV only)				
Were balance checks performed as required? (Level IV only)	~			
Were balance creeks performed as required (Estate and Estate and E				
the second in this second	7			·
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		<b>'</b>		
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this				. 1.1 1.180
SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		<b>V</b>		My History to cease
				, , ,
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike			<b>V</b>	
concentration by a factor of 4 or more, no action was taken.				
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil)	/			
was used for samples that were < 5X the CRDL, including when only one of the	/			
duplicate sample values were < 5X the CRDL				
	7		991119	
Was an LCS anaytzed for this SDG?				
Was an LCS analyzed per extraction batch?	-/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD)	/			
within the 80-120% (85-115% for Method 300.0) QC limits?				
TO RESPONSE PRINCIPAL SECURITY COMMANDE SECURITY	A SALES			
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PF) samples within the acceptance limits?		ليسيا	لنبا	

LDC # 704/56 SDG #: 79/73

# VALIDATION FINDINGS CHECKLIST

Page: Yof Y Reviewer: MM 2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VIII. Sample Result Verilli audil	143			
Wore RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1			
Were detection limits < RL?	V			
				<b>HELITATION</b> TO THE
Overall assessment of data was found to be acceptable.				
Field duplicate pairs were identified in this SDG.		\		
Target analytes were detected in the field duplicates.				
Field blanks were identified in this SDG.		1	,	
Target analytes were detected in the field blanks.			/	

LDC #:<u>~|0415|</u> SDG #:<u>~1173|</u>

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	
Reviewer:_	<u> </u>
2nd reviewer:	- b
_	

All circled methods are applicable to each sample.

Sample ID	Parameter
1-18	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+ COLD
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN. NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRª+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR®+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"
	ph tos ci f No, No, So, Po, Alk CN NH, TKN TOC CR
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	ph tds ci f no, no, so, po, alk cn nh, tkn toc cr
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	ph tos ci f No <sub>s</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> Alk CN NH <sub>3</sub> TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN, NH, TKN TOC CRe+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CROT
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+

Comments:	57

100#: 710/156 SDG #: 211/13 SDG #:

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Reviewer: Page:

METHOD: Inorganics, Method \_

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

Where. %R = Found × 100 True

Found .

True =

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = <u>iS-Di</u> × 100 Where, (S+D)/2

Original sample concentration Duplicate sample concentration () () () ()

					Receiculated	Reported	
Sample 10	Type of Analysis	Bornent	Found / S (units)	True / D (units)	%R / RPD	%R/RPD	Acceptable (Y/N)
	Laboratory control sample						
3		pos	<u> </u>	0.50	ナント	42-4	
	Matrix spike sample		(\$\$R-\$R)				
Ž							
	Duplicate sample					•	>
24-M		107	9888	8470	-	1	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. Was a second

25/holl : 3008

# Validatin Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of A

Method: Inorganics, Method\_

3

The correlation coefficient (r) for the calibration of  $\frac{1000}{1000}$  was recalculated.Calibration date:  $\frac{6/12/6}{100}$ 

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	r or r²	r or r²	(Y/N)
Initial calibration		s1	2	0.005			
	CI04	s2	4	0.01	0.999659	0.999660	•
		s3	10	0.03			>
		s4	25	0.076			~
		s5	50	0.156			
		98	100	0.33			
blygger con continuation	top	مکراه	~%×		326	8-26	7
Calibration verification	to 3	X	W.8		99.2	1.66	7
Calibration verification				·			

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.\_

LDC #:_	2/0	41	5	ط
SDG #:	_V1	15	3	

# VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:	of_	1_
Reviewer:	M	1
2nd reviewer:		

1 /		<del></del>
METHOD: Inorganics, Method	coun	
Please see qualifications below for all question  N N/A  Are results within the calibrates	nd calculated correctly?  d range of the instruments?	stions are identified as "N/A".
NNA Are all detection limits below to	he CRQL?	_reported with a positive detect were
Compound (analyte) results for	quation:	tepotted was a postate dottor more
Concentration =	Recalculation: (15.194.	-45 mx 1) & n 191
Toss - Super Volum	0.002	-95,798/) \f = 7.49/2 = 9400 mg/2
•		• /

	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	ı	(esy (mg/)	205	V5	<u> </u>
		To3 (18/2)	110	7420	<i>V</i>
2	X IV	thy (myl)	1810	1910	1
		Thy (mg/)	2890	Nos	<i>V</i>
-					ŀ
-					
-					
			·		
1				·	

Note:		 		
	•		 	

# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 11, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 270628

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

**ART-6DUP** 

# Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ART-6	Total dissolved solids	45 days	7 days	J- (all detects) R (all non-detects)	Р
PC-119	Total dissolved solids	11 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

# II. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

## III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 270628

SDG	Sample	Analyte	Flag	A or P	Reason
270628	ART-6	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times
270628	PC-119	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 270628

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 270628

No Sample Data Qualified in this SDG

#: orat	270628 tory: <u>MWH Laboratories</u>	<del></del>		L	ev	el 2A					Date: 1919 Page: 10f Reviewer: 41 2nd Reviewer:
HC	D: (Analyte) Perchlora	ate (E	EPA Metho	d 314.0), T	TD	S (EPA I	Metho	d 160.1)	3M25	400)	
saı ati	mples listed below were on findings worksheets.	revie	wed for ea	ch of the fo	ollo	wing va	idatio	n areas. \	√alidatior	n findin	gs are noted in attached
	Validation <i>I</i>	\rea							Comme	ents	
	Technical holding times			5W	Sa	ımpling da	tes: -	5/11	109		
	Initial calibration			N							
)	Calibration verification			N							
	Blanks				Ļ						
/	Matrix Spike/Matrix Spike Du	plicate	es	N		1) ~	۲				
,	Duplicates				_	<u> </u>					
l <u>.                                    </u>	Laboratory control samples				$\perp$	LC3	LCS	. D		******	
<u>I.</u>	Sample result verification			N	lacksquare						
II	Overall assessment of data			A	igapha					<u></u>	
<u>(.                                    </u>	Field duplicates			N	_					.,	
	Field blanks			1 7							
:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rir	nsate	is d	etected		TB = Trip b	olank	k	
late	ed Samples:	<b></b>	- <u>L</u>								
T	ART-1	11	SF-1			21				31	
┪		12	PC-117			22				32	
T		13	PC-118			23				33	
7		14	PC-119 ·			24				34	
	salation.	#: 270628 pratory: MWH Laboratories  THOD: (Analyte) Perchlora  samples listed below were lation findings worksheets.  Validation A  Technical holding times  Initial calibration  Calibration verification  Blanks  Matrix Spike/Matrix Spike Du  Duplicates  Laboratory control samples  Sample result verification  Sample result verification  Celibration verification  A complexity control samples  Field duplicates  Field duplicates  A complexity control samples  A complexity control samples  A complexity control samples  Center of the control samples  The control samples  Center of the co	#: 270628 pratory: MWH Laboratories  HOD: (Analyte) Perchlorate (Esamples listed below were revies ation findings worksheets.  Validation Area  Technical holding times  Initial calibration  Calibration verification  Blanks  Matrix Spike/Matrix Spike Duplicate  Duplicates  Laboratory control samples  Sample result verification  Laboratory control samples  Sample result verification  Celibration  Area  Area  Technical holding times  Duplicates  Area  Are	#: 270628 pratory: MWH Laboratories  ##: 270628 pratory: MWH Laboratories  ##: 270628  ##:	# 270628 pratory: MWH Laboratories  HOD: (Analyte) Perchlorate (EPA Method 314.0),  samples listed below were reviewed for each of the foation findings worksheets.  Validation Area  Technical holding times  Initial calibration  Read Matrix Spike/Matrix Spike Duplicates  Duplicates  Laboratory control samples  Laboratory control samples  Sample result verification  Noverall assessment of data  Field duplicates  A = Acceptable N = Not provided/applicable SW = See worksheet  ART-1  ART-2  12 PC-117  ART-3  13 PC-118	#: 270628 #: 270628  CHOD: (Analyte) Perchlorate (EPA Method 314.0), TD:  samples listed below were reviewed for each of the folic lation findings worksheets.  Validation Area  Technical holding times  Initial calibration  Calibration verification  Blanks  Matrix Spike/Matrix Spike Duplicates  Duplicates  Laboratory control samples  Sample result verification  N  Sample result verification  N  Calibration  N  C	##: 270628  FHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Isamples listed below were reviewed for each of the following valuation findings worksheets.    Validation Area	Level 2A  ## 270628  #	##: 270628 Level 2A  Pratory: MWH Laboratories  HOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1)  samples listed below were reviewed for each of the following validation areas. ation findings worksheets.  Validation Area  Technical holding times  Initial calibration  Row Calibration verification  Blanks  Matrix Spike/Matrix Spike Duplicates  Duplicates  Laboratory control samples  Laboratory control samples  Sample result verification  N  Overall assessment of data  Field duplicates  Field duplicates  A POP No compounds detected R = Rinsate FB = Field blank  ART-1	#: 270628  Level 2A  Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1)  ##: 270628  ##: 270628  Level 2A  ##: 270628  ##: 270628  Level 2A  ##: 270628  ##: 270628  Level 2A  ##: 270628	#: 270628  FHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1)  Samples listed below were reviewed for each of the following validation areas. Validation finding attion findings worksheets.    Validation Area

	ART-1	11	SF-1	21	31
2	ART-2	12	PC-117	22	32
3	ART-3	13	PC-118	23	33
4	ART-4	14	PC-119 ·	24	34
5	ART-6	15	PC-120	25	35
6	ART-7	16	PC-121	26	36
7	ART-8	17	PC-133	27	37
8	PC-99R2/R3	18	ART-9	28	38
9	PC-115R	19_	ART-6DUP	29	39
10	PC-116R	20	PB	30	40

Notes:	

LDC #: 2134176 SDG #: 270628

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-18	W	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ C104
1 10		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
19	ري	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
. 0,0,0		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+

Comments:	

LDC #: 2104176 SDG #: 270628

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: \\_of\_\ Reviewer: 🔥 🕽 2nd reviewer:

All circled dates have exceeded the technical holding time.

Were all samples preserved as applicable to each method? Y)N N/A

N N/A Were all cooler temperatures within validation criteria? 160.1/5/125402 Method: ZGT Parameters: 7 days Technical holding time: **Analysis Analysis Analysis Analysis Analysis** Sampling Qualifier date date date date date date Sample ID J-1218 (W) (45 day 6/25/09 5/11/09 5 5/ EN --(11 days 5/11/09 5/22/39 14

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

May 20, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271066

Sample Identification

CLDR-2

M-130

M-129

M-67

M-66

FB-CLDR-2

# Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis Required Holding Time From Sample Collection Until Analysis		Flag	A or P
M-67 M-66	Total dissolved solids	36 days	7 days	J- (all detects) R (all non-detects)	Р

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

# II. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

Sample FB-CLDR-2 was identified as a field blank. No contaminant concentrations were found in this blank.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271066

SDG	Sample	Analyte	Flag	A or P	Reason
271066	M-67 M-66	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271066

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271066

No Sample Data Qualified in this SDG

SDG :	#:21041U6 #:_271066 atory:_MWH_Laboratories	LIDATIOI		PLETEN evel 2/	Date: →   △   Page: _ ( of _ ( Reviewer: _ △ ⟨ 2nd Reviewer: _ (					
METH	HOD: (Analyte) Perchlo	rate (	EPA Metho	d 314.0), <sup>-</sup>	TDS (EF	A Me	ethod 160.1) s.m.	25400	_	
	amples listed below were tion findings worksheets.		wed for ea	ch of the fo	ollowing	valida	ation areas. Valida	ation find	ings are noted in attached	
	Validation	Area					Con	nments		
<u> </u>	Technical holding times			ടധ	Sampling	dates	: 5/20/0	9		
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike D	uplicate	es	N	7 C1	:~1	Spriled			
V	Duplicates			7	)					
VI.	Laboratory control samples	Δ	LCS/CCSM							
VII.	Sample result verification	N								
VIII.	Overall assessment of data		A							
IX.	Field duplicates			N						
L <sub>X</sub>	Field blanks			20	FB: 6					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	)	R = Rin	o compound sate eld blank	s detected		D = Duplicate TB = Trip blank EB = Equipment b	olank		
√alidat	ed Samples:	ر ب								
1	CLDR-2	11			21			31		
2	M-130	12			22			32		
3	M-129	13			23			33		
4	M-67 -	14			24			34		
5	M-66 '	15			25			35		
6	FB-CLDR2 FB-CLDR-2	16			26			36		
7	PB	17			27			37		
8		18			28			38		
9		19			29			39		
10		20			30			40		

LDC#:<u>21041U</u>6 SDG#:<u>231066</u>

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_of \\_
Reviewer: \_\_\_\_
2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-6	w _	pH (TD) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR (C124)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
. 5.7 %		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	· ·	ph TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:				 		 	
<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	 	·····	 	 	<del>*                                    </del>	 	

LDC #: 2104106 SDG #: 271066

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>(</u> of	<u></u>
Reviewer:	A 2	
2nd reviewer:	1~	_

All circled dates have exceeded the technical holding time.

Method: 5M2540C Parameters: TD5 7 days Technical holding time: Sampling **Analysis Analysis Analysis Analysis Analysis** date date date date date Qualifier Sample ID date J-12 P (h) 5/20/09 25/29 4-5 (36 da 12

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 8, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271687

Sample Identification

M-7B

M-7BDUP

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271687

No Sample Data Qualified in this SDG

SDG#	21041V6 : 271687 ttory: MWH Laboratories		IDATIO!		LETENESS evel 2A	S WORKS	SHEET	Date: ੨   ੧   ɔ- Page: _ , of _ Reviewer: 2nd Reviewer:
METH	OD: (Analyte) Perchlo	rate (E	.PA Metho	d 314.0), <sup>-</sup>	TDS (EPA Me	thod 160.1	SM 2540C	_
The sa validati	amples listed below were ion findings worksheets	e review	ved for ea	ch of the fo	ollowing valida	ation areas.	Validation findi	ngs are noted in attached
	Validation	Area					Comments	
I.	Technical holding times			Δ	Sampling dates	ا ( ا	109	
Ila.	Initial calibration			N				
llb.	Calibration verification			N				
III.	Blanks			A				
IV	Matrix Spike/Matrix Spike D	uplicates	S	N	3 Dag			
V	Duplicates			A	)			
VI.	Laboratory control samples			_ A_	LC5 / L	C 2 D		
VII.	Sample result verification			N				
VIII.	Overall assessment of data	1		A				
IX.	Field duplicates			i)				
_x_	Field blanks		<u> </u>					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	е	R = Rin	lo compound nsate ield blank	ls detected	D = Duplio TB = Trip EB = Equ		
Validate	ed Samples:	ب س	<u></u>					
1	M-7B	11			21		31	
2	M-7BDUP	12			22		32	
3 (	DARS PB	13			23		33	

Notes:\_\_\_\_\_

6\_

LDC #: 21041V6
SDG #: 271687

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
(	$\omega$	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C10-1
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2	3	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
		pH TDS CLF NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
LL		pH TDS CLF NO. NO. SO. PO. ALK CN NH. TKN TOC CR6+

Comments:	 	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 9, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271791

Sample Identification

H-28A

H28ADUP

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

## VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271791

No Sample Data Qualified in this SDG

SDG :	#: <u>21041W6</u> #: <u>271791</u> ratory: <u>MWH Laboratories</u>		LIDATION		PLETEN _evel 2/		)RKSH	HEET	Date: ¬ ( q )  Page: _ of _ c  Reviewer: _ d  2nd Reviewer: _ c
METI	HOD: (Analyte) Perchlo	rate (l	<u>=PA Metho</u>	d 314.0),	TDS (EF	'A Method 1	160.1	5M2540C	
The s valida	samples listed below were ation findings worksheets.	revie	wed for eac	ch of the f	following	validation a	ireas. Va	alidation findi	ngs are noted in attached
	Validation	Area						Comments	
l.	Technical holding times			Λ	Sampling	g dates: 🕓	19	109	
IIa.	Initial calibration			N			·		
ilb.	Calibration verification			N					
111.	Blanks			A					
IV	Matrix Spike/Matrix Spike D	uplicate	es	2	170	up -			
V	Duplicates			Α					
VI.	Laboratory control samples			Α_	LCS	1 LCSD			
VII.	Sample result verification			N		-	<u> </u>		
VIII.	. Overall assessment of data	1		A_					HARLES CONTRACTOR OF THE STATE
IX.	Field duplicates			N					
Lx	Field blanks			7					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	9	R = Rins	o compound sate eld blank	ds detected	TB	Duplicate = Trip bla = Equipm		
Validat	ted Samples:	( we							
1	H-28A	11			21			31	
2	H-28ADUP	12			22			32	
3	PB	13			23			33	
4		14			24			34	
5		15			25			35	
6		16			26			36	
7		17			27			37	
11 '	4	,	1		l	1		ا مما	

10	20	30	40
Notes:			

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LDC #: 21041كاره SDG #: 271791

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \\_of\_\( \)
Reviewer: \\_A\( \)
2nd reviewer: \\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
(	$\omega$	pH TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (CIO' <sub>4</sub> )
_		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
2	رب	PH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	·	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
_		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO <sub>3</sub> NO <sub>3</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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Comments:	 		

# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 9 through June 10, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271832

# Sample Identification

M-87 PC-91 PC-98R PC-97 PC-86 PC-18 PC-90 PC-55 PC-56 PC-101R PC-58 L-635

PC-59

PC-60

PC-62

-0 0

PC-68

PC-122

MW-K4

ARP-1

ARP-4A

ARP-5A

ARP-6B

ARP-7

PC-53

PC-103

MW-K5

#### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

## VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 271832

No Sample Data Qualified in this SDG

SDG # Labora	:_ 21041X6 : 271832 atory: MWH Laboratories  OD: (Analyte) Perchlor	<u> </u>		L	_eve	el 2A		1	400	Date: 2   9   Page:of Reviewer: 2nd Reviewer:
The sa	amples listed below were ion findings worksheets.	revi	ewed for ea	ch of the f	ollow	ving v	alidation areas	s. Validation	n fin	dings are noted in attached
	Validation /	<u>Area</u>	<u> </u>	<u> </u>	<u> </u>			Comme	<u>ents</u>	
<u> </u>	Technical holding times			A	Sam	ipling c	dates: 💪 🖟	3 09	-	6/10/09
lla.	Initial calibration		N	<u></u>			`			
IIb.	Calibration verification	N								
	Blanks									
IV	Matrix Spike/Matrix Spike Du	uplica	tes	N	]	CI	in4 Spai	fd		
V	Duplicates			7						
VI.	Laboratory control samples			A	LCS/LCSD					
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A				···	_	
IX.	Field duplicates			2						
	Field blanks			\\ \						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compounds sate eld blank	s dete	ected	D = Dupi TB = Trip EB = Eq			
Validated	d Samples:	we	<u></u>							
1 N	M-87	11	PC-122			21	PC-91		31	
	PC-98R	12	MW-K4			22	PC-97		32	
	PC-86	13	ARP-1			23	PC-18		33	
	>C-90		ARP-4A				PC-55		34	
	PC-56		ARP-5A				PC-101R		35	
	PC-58		ARP-6B			1	L-635		36	

10	PC-68	20 MW-K5	30	40
Note	es:			
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PB

37

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28

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PC-59

PC-60

PC-62

17

18

19

ARP-7

PC-53

PC-103

LDC #: 21041x6 SDG #: 271832

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	<u>\</u> of <u>\</u>
Reviewer:	Al
2nd reviewer:	i~

All circled methods are applicable to each sample.

		_
Sample ID	Matrix	Parameter Parameter
1-26	W	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR6+ (CIO)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 10, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271854

Sample Identification

M-6A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271854

No Sample Data Qualified in this SDG

SDG	#:21041Y6 #:_271854 ratory:_MWH Laboratories		LIDATIO		PLETE _evel 2		SS WORKSI	HEET	Date: a la los Page: of reviewer: A leader 2nd Reviewer:
METH	HOD: (Analyte) Perchlor	rate (	EPA Metho	od 314.0),	TDS (E	<u> </u>	/lethod 160.1	M 2540C	
	amples listed below were tion findings worksheets.	revie	ewed for ea	ch of the f	followin	g vali	dation areas. V	alidation findi	ngs are noted in attached
	Validation /	Area						Comments	
1.	Technical holding times			A	Sampli	ng date	es: ( ( 1 s	109	
IIa.	Initial calibration			N					
IIb.	Calibration verification			N					
III.	Blanks			A					
IV	Matrix Spike/Matrix Spike Duplicates			1	7 Cl: A Sprife of				
V	Duplicates			. 7					
VI.	Laboratory control samples				LCS	· /	LCSD		
VII.	Sample result verification			N		1			
VIII.	Overall assessment of data			A					
IX.	Field duplicates			~					
X	Field blanks			N					
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound sate eld blank	s detecte	ed	D = Duplicate TB = Trip bla EB = Equipm	nk	
·	du m	<u> </u>							
1	M-6A	11			2	1		31	
2	PB	12			2	2		32	
3		13			2	3	····	33	
4		14			2	4		34	
5	W HOUSe And A Company	15			2	5		35	
6		16			2	6 T		36	

Notes:\_

LDC#: 2104146 SDG#: 271854

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: <u>\</u> of <u>\</u>
Reviewer:
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
	W	
	$\sim$	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (Clo <sub>4</sub> )
		pH TDS CLF NO NO SO PO ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO NO SO PO ALK ON NH3 TKN TOC CR6+
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2 × 5 × 6 × 6		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 15, 2009

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 271999

Sample Identification

MC-53

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

## VI. 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.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 271999

No Sample Data Qualified in this SDG

SDG # Labora	: <u>21041Z6</u> #:_ <u>271999</u> atory:_ <u>MWH_Laboratories</u>	S		Level 2A	I		Date: ¬¬ (¬ Page: _ of _ Reviewer: △√ 2nd Reviewer: _ √
	IOD: (Analyte) Perchlo				\		
	tion findings worksheets.		1	T			90 4.0
<u> </u>	Validation	<u>Area</u>			1100	Comments	
<u>l.</u>	Technical holding times		A	Sampling date	es: 6   15	109	
IIa.	Initial calibration		N				
llb.	Calibration verification		N			<del> </del>	
111.	Blanks		Δ				
IV	Matrix Spike/Matrix Spike Du	uplicates	<u> </u>	Cliv.	+ Spuisi-	<u>k</u>	
V	Duplicates		<u></u>	<u> </u>	<b>\</b>		
VI.	Laboratory control samples		A	LCS /	C(5D		
VII.	Sample result verification		N				·
VIII.	Overall assessment of data		Δ				
IX.	Field duplicates		N				
_x_	Field blanks		<i>N</i>				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	e F	ND = No compound R = Rinsate FB = Field blank	is detected	D = Duplicat TB = Trip bla EB = Equipr	ank	
Validate	ed Samples:	wh					
1 1	MC-53	11		21		31	
2	PB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
		16		26		36	

1	MC-53	11	21	31	
2	PB	12	22	32	
3		13	23	33	
4		14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:			

LDC #: <u>210412</u>6 SDG #: <u>27199</u>5

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
. (	$\omega$	pH (TD\$ CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN- NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (CIO <sub>4</sub> )
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
in the state of		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 16, 2009

LDC Report Date:

July 27, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 272056

Sample Identification

M-29

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

## VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 272056

No Sample Data Qualified in this SDG

SDG	#:21041AA6 #:_272056 atory:_MWH_Laboratories	-	LIDATIO		PLETE Level 2		SS WORKS	SHEET	Date: 구   의  Page: of _  Reviewer:  2nd Reviewer:
METH	HOD: (Analyte) Perchic	rate (	EPA Metho	od 314.0),	TDS (E	PA N	Method 160.1	3M 254 0C	)
The s valida	amples listed below were tion findings worksheets.	e revi	ewed for ea	ch of the f	followin	g vali	dation areas.	Validation findin	-  gs are noted in attached
	Validation	Area						Comments	
1.	Technical holding times			A	Samplir	ng dat	es: 💪 🛘 1 (	, 109	
IIa.	Initial calibration			N			,		
Ilb.	Calibration verification			N					
III.	Blanks			A					
IV	Matrix Spike/Matrix Spike D	uplicat	es	L L	17 c	<u>ر ا ر</u>	4 Specif	: حل	
٧	Duplicates			N					
VI.	Laboratory control samples			Δ	LC	SIC	-c 5 D		
VII.	Sample result verification			N					
VIII.	Overall assessment of data		····	A					
IX.	Field duplicates			N					*
Х	Field blanks			1					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	!	R = Rin	o compound sate eld blank	ls detecte	ed	D = Duplica TB = Trip b EB = Equip	lank	
/alidate	ed Samples:	ω,	~ _						
1	M-29	11			2	1		31	
2	PB	12			22	2		32	
3		13			23	3		33	
4		14			24	4		34	
5		15			25	5		35	
6		16			26	6		36	
7	MANUFACTURE TO THE PARTY OF THE	17			27	7		37	
8		18			28	В		38	
9	manusar a company of the company of	19			29	9		39	
10		20			30	o		40	

LDC #: 21041AA C SDG #: 272050

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	<u>Parameter</u>
(	W	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ (C124)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2009 Annual Remedial Performance Sampling

**Collection Date:** 

June 25, 2009

**LDC Report Date:** 

July 27, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 272306

Sample Identification

PC-94

PC-2

PC-1

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2009 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

2009 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 272306

No Sample Data Qualified in this SDG

SDG#	#:21041BB6 #:_272306 atory:_MWH Laboratories	, <b></b> .	ATION		PLETENI evel 2A		WORKSHE	EΤ	Date: ¬   q   s  Page: 1 of 1  Reviewer:
METH	HOD: (Analyte) Perchlor	rate (EPA	Method	314.0), 7	TDS (EPA	\ Meth	od 160.1 5 ~	125406	, Chtack (EPA
The sa	amples listed below were tion findings worksheets.	reviewed			ollowing v	alidatio	on areas. Vali	dation findir	ngs are noted in attached
	Validation	Area					Cı	omments	
I.	Technical holding times			A	Sampling of	dates:	6/25	109	
lla.	Initial calibration			N					
IIb.	Calibration verification			N					
III.	Blanks			۵					
IV	Matrix Spike/Matrix Spike Du	uplicates		$\sim$	110	<u> 4</u>	5 peri.	1:2	
V	Duplicates			7			ī		
VI.	Laboratory control samples			Δ	LCSI	146	2 2		
VII.	Sample result verification			N					
VIII.	Overall assessment of data			Δ					
IX.	Field duplicates	·		<u>~</u>					
Lx_	Field blanks								
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	į	ND = No o R = Rinsa FB = Field	ate	ls detected		D = Duplicate TB = Trip blank EB = Equipmer		
Validat	ted Samples:	ـــــــــــــــــــــــــــــــــــ							
1	PC-94	11			21			31	
2	PC-2	12			22			32	
3	PC-1	13			23			33	
4	PR	14			24			34	
	<u> </u>	15			25			35	

LDC #: 21041886 SDG #: 272306

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

Sample ID	Matrix	<u>Parameter</u>
1-2	$\omega$	pH (TD\$ CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C104)
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
3	W	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRECED CD
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
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		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
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		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN- NH, TKN TOC CR <sup>6+</sup>

Comments:			
	 	<del></del>	



# LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Tronox, LLC P.O. Box 55

August 5, 2009

Henderson NV 89009

ATTN: Ms. Susan Crowley

SUBJECT: 2008 Annual Remedial Performance Sampling, Data Validation

Dear Ms. Crowley,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 30, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

# **LDC Project # 21107:**

# SDG#

#### Fraction

248147, 249697, 249779, 249900, 249949, 250101, 250123, 250139, 250388, 250906, 251027, 251181, 253362, 253834, 256589, 257010, 258290, 258305, 258410, 258563, 258623, 258639, 258779, 259063, 261012, 261275

Chromium, Wet Chemistry

The data validation was performed under Stage 2A & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance, May 2006
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto

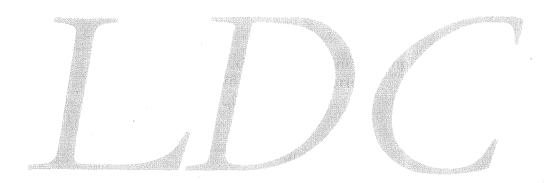
**Operations Manager/Senior Chemist** 

Attachment 1

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# 2008 Annual Remedial Performance Sampling Data Validation Reports LDC# 21107

Chromium



# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 4, 2008

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249697

# Sample Identification

PC-123 FB-1
PC-124 MD-3
PC-125 MD-4
PC-126 PC-73MS
PC-127 PC-73MSD
PC-128 FB-1MS
PC-129 FB-1MSD

PC-130

PC-131

PC-132

M-96

PC-54

M-48

PC-71

PC-72

PC-73

PC-37

M-23

M-95

M-44

## Introduction

This data review covers 27 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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 this SDG

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-1 was identified as a field blank. No chromium was found in this blank.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

# XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## 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-71 and MD-3 and samples M-23 and MD-4 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentration (mg/L)				Flag	A or P
Analyte	e PC-71 MD-3		RPD (Limits)	Difference (Limits)		
Chromium	0.39	0.39	0 (≤30)	-	-	-

	Concentration (mg/L)					
Analyte	M-23	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	0.77	0.80	4 (≤30)	•	-	-

# 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 249697

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 249697

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 249697

No Sample Data Qualified in this SDG

SDG	#:21107B4 #:_249697 ratory:_MWH_Laborato		ALIDATIOI 		PLETE Stage 2		ESS WOR	KSHEET		Date: ع لول إ Page: _ of _ ر Reviewer: _ ما 2nd Reviewer: ر
MET	HOD: Chromium (EPA	SW 84	6 Method 60	)10B)						
	samples listed below wation findings workshe		ewed for ead	ch of the f	ollowing	g va	alidation area	as. Validatio	n finc	dings are noted in attached
	Validati	on Area						Comm	ents	
I.	Technical holding times			A	Samplin	ng d	lates: 🖇	8C/ H		
11.	Calibration			N						
III.	Blanks			Δ		·				
IV.	ICP Interference Check	Sample (I	CS) Analysis	N						
V.	Matrix Spike Analysis			A	3 M	15	IMSD			·
VI.	Duplicate Sample Analysis			<u>~</u>						
VII.	Laboratory Control Samples (LCS)			Δ	LCS					
VIII	Internal Standard (ICP-MS)			N	Not Wtilitud					
IX.	Furnace Atomic Absorption QC			7	L L					
Χ.	ICP Serial Dilution	ICP Serial Dilution			Not vericued for Luch 2A					
XI.	Sample Result Verificati	ion		N						
XII.	Overall Assessment of I	Data		A					***************************************	
XIII	Field Duplicates			ತಟ	D' =	· )	4+22	D= 18	+ 2.	3
XIV	Field Blanks			20	FB		21			
Note: √alida	A = Acceptable N = Not provided/applic SW = See worksheet ted Samples:		R = Rins FB = Fie	o compound: sate eld blank	s detecte	∍d		plicate rip blank quipment blanl	k	
1	PC-123	11	M-96		21	1	FB-1		31	
2	PC-124	12	PC-54		22		MD-3 'S'		32	
3	PC-125	13	M-48		23	3	MD-4 5 -		33	
4	PC-126	14	PC-71 D,		24		PC-73MS		34	
5	PC-127	15	PC-72		25		PC-73MSD		35	
6	PC-128	16	PC-73		26	6	FB-1MS		36	
7	PC-129	17	PC-37		27	7	FB-1MSD		37	
8	PC-130	18	M-23 N		28	8	MB		38	

Notes:		

29

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39 40

19

20

M-95

M-44

PC-131

PC-132

LDC#:	21107B4
SDG#:	See Cover

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u>\</u> of <u>\</u>
Reviewer:	Al
2nd Reviewer:	12

METHOD: Metals (EPA Method 6010B)

YN NA YN NA Were field duplicate pairs identified in this SDG?
Were target analytes detected in the field duplicate pairs?

	Concentra			
Compound	14	22	(≤ 30) RPD	
Chromium	0.39	0.39	0	

	Concentra			
Compound	18	23	(≤ 30) RPD	
Chromium	0.77	0.80	4	

V:\FIELD DUPLICATES\FD\_inorganic\21107B4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249779

Sample Identification

MW-5A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

# V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

# VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

# VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VIII. Laboratory Control Samples (LCS)

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

# IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

# X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 249779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 249779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 249779

No Sample Data Qualified in this SDG

SDG	#:21107C4 i #: 249779 oratory: MWH Laboratori		ALIDATIO 			<b>TEN</b> e 2A	ESS WORKSI	HEET	Date: 4 (4) September 1	
MET	HOD: Chromium (EPA S	SW 84	6 Method 6	010B)					zna Reviewer	
The valid	samples listed below we ation findings worksheet	re rev s.	iewed for ea	ch of the	follov	ving v	alidation areas. V	alidation findi	ngs are noted in attached	
	T	. 1			1				7	
<u> </u>	Validatio	n Area	1		<u> </u>		1	Comments		
	Technical holding times			Δ.	Sam	pling o	lates: 8 5	108		
11.	Calibration			N	-					
III.	Blanks			Δ_	-					
IV.	ICP Interference Check Sa	ample (	ICS) Analysis	N	Ļ					
V.	Matrix Spike Analysis			A	{	£_,	24969	<i>†</i> -		
VI.	Duplicate Sample Analysis	3		7	$\bot \bot$					
VII.	Laboratory Control Sample	s (LCS	)	A	<u>                                     </u>	C Z				
VIII	Internal Standard (ICP-MS	)		N	Not Utilized					
IX.	Furnace Atomic Absorption	n QC		N	ļ	L				
Χ.	ICP Serial Dilution			N	Not reviewed for Lynd 2A					
XI.	Sample Result Verification	:		N				J		
XII.	Overall Assessment of Date	ta		A						
XIII.	Field Duplicates			7						
XIV.	Field Blanks		· · · · · · · · · · · · · · · · · · ·	<u> </u>						
Note: √alida	A = Acceptable N = Not provided/applicable SW = See worksheet sed Samples:		R = Rin FB = Fi	o compound sate eld blank	s dete	cted	D = Duplicate TB = Trip blar EB = Equipme	nk		
1	M-5A	11	1			21		31		
2	MB	12				22		32		
3		13				23		33		
4		14				24				
5		15				25		34		
6		16			:	26		36		
7		17				27		37		
8		18				28		38		
9		19				29		30		

Notes:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249900

## Sample Identification

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

#### Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-1 (from SDG 249949) was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

SDG 7	#: _21107D4 #: _249900 atory: <u>MWH Laboratories</u>		LIDATION		LETE tage 2		ESS WORKSH	IEET	Date: عـ اد ا Page: _ of _ \ Reviewer: _ حـا 2nd Reviewer: _ (مــا
NETH	HOD: Chromium (EPA SV	V 846	Method 60	10B)					
	amples listed below were tion findings worksheets.	revie	ewed for eac	ch of the fo	ollowing	g va	ilidation areas. V	alidation find	dings are noted in attached
-	Validation	Area						Comments	
1.	Technical holding times			A	Samplii	ng d	ates: 8   7	28 	
11.	Calibration			N			,		
111.	Blanks			<u> </u>					
IV.	ICP Interference Check Sam	nple (IC	CS) Analysis	N					
V.	Matrix Spike Analysis			Α	₹ €	ــر ر	249697	+ 1240	2949
VI.	Duplicate Sample Analysis			2					
VII.	Laboratory Control Samples	(LCS)		A	LL	2			
VIII.	Internal Standard (ICP-MS)			N	No	+	Utilized		
IX.	Furnace Atomic Absorption	QC		7	1		L		
X.	ICP Serial Dilution			N	No	+	reviewed	for La	ul 2A
XI.	Sample Result Verification			N				U	
XII.	Overall Assessment of Data			A					
XIII.	Field Duplicates			<i>\\</i>					
XIV.	Field Blanks			70	EB		EB-1 (f.	249	949)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin:	o compound sate eld blank	s detect	ed	D = Duplicate TB = Trip bla EB = Equipm	nk	
√alidat	ed Samples:	، ہے،							
1	1-0	11	I-M		2	21		31	
2	I-P	12	I-D			22		32	
3	I-H	13	I-C		2	23		33	
4	I-U	14	I-S		2	24		34	
5	I-T	15	I-L		2	25		35	
6	I-G	16	I-R		2	26		36	
7	I-Q	17	I-B			27		37	

10	I-E	20	30	40	
Note	3.				
	· .				

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# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249949

## Sample Identification

I-AA

M-131

M-64

M-65

M-66

M-79

M-69

M-135

M-99

M-25

M-57A

M-37

EB-1

MD-5

I-AAMS

I-AAMSD

#### Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-1 was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

Samples M-65 and MD-5 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Concentration (mg/L)							
Analyte	M-65	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	35	35	0 (≤30)	-	-	-	

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 249949

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 249949

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 249949

No Sample Data Qualified in this SDG

SDG Labo	#: <u>21107E4</u> #: <u>249949</u> ratory: <u>MWH Laboratorie</u>	es	<del>-</del>	S	LETENESS V tage 2A	VORKSHEET	Date: ع كى أي			
The s	HOD: Chromium (EPA S samples listed below wer ation findings worksheets	e revi		•	ollowing validation	n areas. Validation find	dings are noted in attached			
	Validation	n Area				Comments				
l.	Technical holding times			A	Sampling dates:	8 5 0908				
II.	Calibration			N						
III.	Blanks			Α						
IV.	ICP Interference Check Sa	ample (I	CS) Analysis	N						
V.	Matrix Spike Analysis			A	ZMS/MS	5.5				
VI.	Duplicate Sample Analysis	3		<u>٦</u>						
VII.	Laboratory Control Sample	es (LCS	)	A	LCS					
VIII	. Internal Standard (ICP-MS	5)		N	Not WA	: litud				
IX.	Furnace Atomic Absorption	n QC		7	l					
X.	ICP Serial Dilution			N	Not reviewed for bul 2A					
XI.	Sample Result Verification	<u> </u>		Ň	U					
XII.	Overall Assessment of Da	ta								
XIII	. Field Duplicates			<u>5 W</u>	1):4+1~	4				
XI∨	. Field Blanks			70	EB:13					
N = Not provided/applicable R = Rins				o compound sate eld blank	-	D = Duplicate TB = Trip blank EB = Equipment blank				
Valida	ited Samples:	, ,	١							
Γ.	<u> </u>	$\frac{\alpha}{1}$	W 570		21	31				
1	I-AA	11	M-57A		22	32				
2	M-131	12	M-37 EB-1		23	33				
3	M-64 M-65 °	14	MD-5		24	34				
4		15	1		25	35				
5 6	M-66 M-79	16	I-AAMSD	I-AAMS		36				
7	M-69	17	MB			37				
8	M-135	18	/~(13		27	38				
9	M-99	19			29	39				
10	M-25	20			30	40				
_10	INITES	1 40			100 1	170				

LDC#:	21107E4
SDG#:	See Cover

## **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page:	of
Reviewer:_	21_
2nd Reviewer:	

METHOD: Metals (EPA Method 6010B)

YN NA Y)N NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	ation (mg/L)		
Compound	4	14	(≤ 30) RPD	
Chromium	35	35	0	

V:\FIELD DUPLICATES\FD\_inorganic\21107E4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 6, 2008

**LDC Report Date:** 

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250101

## Sample Identification

I-Z

**|-**|

I-V

M-67

M-74

M-73

M-88

M-12A

M-11

MD-1

EB-2

#### Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 was identified as a field blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-11 and MD-1 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (mg/L)				
Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	3.1	3.0	3 (≤30)	-	-	_

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 250101

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 250101

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 250101

No Sample Data Qualified in this SDG

SDG # .abora	:21107F4 t:_250101 atory:_MWH_Laboratories	3	LIDATION	S	LETEN tage 2		ORKS	SHEET		Date: ¬ (ሬ ) of _ · Page: _ · of _ · Reviewer: _ A & _ 2nd Reviewer: _ ·
he sa	·	revie			ollowing	validatior	areas.	Validatio	n finc	lings are noted in attached
	Validation	Area					·	Commo	ents	
1.	Technical holding times			A	Sampling	dates: 8	<u>i   6</u>	80		
11.	Calibration			N		, , <del>v</del>				
<b>III.</b>	Blanks			Α						
IV.	ICP Interference Check San	nple (IC	CS) Analysis	N						
V.	Matrix Spike Analysis			Δ	15 t	_ 2	499-	19		
VI.	Duplicate Sample Analysis			2						
VII.	Laboratory Control Samples	(LCS)		Д	LLS					
VIII.	Internal Standard (ICP-MS)			N	Not utilized					
IX.	Furnace Atomic Absorption	QC		2	l l					
Χ.	ICP Serial Dilution			N	Hot	veries	کار را	ba Le	ml	۸2
XI.	Sample Result Verification	MPT .		N				0		
XII.	Overall Assessment of Data			Α						
XIII.	Field Duplicates			sω	Ъ.	9+10	)			
XIV.	Field Blanks			20	EB=					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound			D = Duplic TB = Trip   EB = Equi		k	
1	I-Z	11	EB-2		21				31	
	I-I	12	MB		22				32	
	I-V	13	1-1.5		23				33	
	M-67	14			24				34	
	M-74	15			25				35	
6	M-73	16			26				36	
7	M-88	17			27				37	
8	M19A 44 - 12 A	18			28				38	

29

39

10 MD-1

Notes:\_\_

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#### LDC#: 21107F4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:	of <u>\</u>
Reviewer:_	AI
2nd Reviewer:	~

METHOD: Metals (EPA Method 6010B)

(YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra			
Compound	9	10	(≤ 30) RPD	
Chromium	3.1	3.0	3	

V:\FIELD DUPLICATES\FD\_inorganic\21107F4.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 6, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250123

## Sample Identification

M-92

M-97

M-31A

M-50

M-34

M-35

M-19

M-39

M-68

M-61

I-K

I-J

M-19MS

M-19MSD

#### Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- Part are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 (from SDG 250101) was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

DG#	21107G4 : 250123 tory: <u>MWH Laboratories</u>	Date: ユ ( ( ) · Page: · of _ · Reviewer: △ / 2nd Reviewer: ←								
	OD: Chromium (EPA SW									
he sa alidat	mples listed below were fon findings worksheets.	revie	wed for eac	h of the fo	ollowing validation	on areas. Vali	dation findin	gs are noted in attached		
	Validation Area				Comments					
l.	Technical holding times			A	Sampling dates: % ししし8					
	Calibration			N						
III.	Blanks			A			·-·			
IV.	ICP Interference Check Sam	ple (IC	S) Analysis	N						
V.	Matrix Spike Analysis			A	CMSIN	120				
VI.	Duplicate Sample Analysis			7						
VII.	Laboratory Control Samples	(LCS)		A	LCS					
VIII.	Internal Standard (ICP-MS)			N	Not Us	1:1:4-2				
IX.				2	L	l				
X.				N	Not ver	:ws fr	- Lud	<b>2</b> A		
XI.				N		0				
XII.				A						
XIII.				2						
XIV.				25	EB: EB	-2 (fr.	- 2001	٥١)		
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip blank EB = Equipme				
			I-K		21		31			
	M-92	12	I-J		22		32			
	M-97	13	M-19MS		23		33			
3	M-31A	14	M-19MSD		24		34			
4	M-50	15			25	***************************************	35			
5	M-34 M-35	16	MR		26		36			
6 7	M-19	17			27		37			
8	M-39	18			28		38			
	M-68	19			29		39			
9 10	M-61	20			30		40			

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 7, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250139

## Sample Identification

M-87

M-70

M-71

M-72

M-38

M-22A

M-89

M-17A

M-115

M-14A

M-36

M-84

M-10

MD-2

M-100

M-84MS

M-84MSD

#### Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-84 and MD-2 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentration (mg/L)						
Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	0.065	0.067	3 (≤30)	-	-	-	

### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 250139

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 250139

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 250139

No Sample Data Qualified in this SDG

SDG	OC #: 21107H4 VALIDATION COMPLETENESS WORKSHEET OG #: 250139 Stage 2A boratory: MWH Laboratories						ΞT	Date: ¬ \ \ \ Page: ¬ of \ Reviewer: △ △ 2nd Reviewer:	
METI	HOD: Chromium (EPA S	W 84	6 Method 60	)10B)					
	amples listed below were tion findings worksheets		ewed for ea	ch of the fo	ollowing	g va	alidation areas. Valida	ation find	ings are noted in attached
	Validation	Area					Con	nments	
l.	Technical holding times			Α	Sampling dates: 8 7 08				
11.	Calibration			N	ļ				
III.	Blanks			A					
IV.	ICP Interference Check Sar	mple (I	CS) Analysis	N	<u> </u>			····	
V.	Matrix Spike Analysis			A	1 / N	15	MSD		
VI.	Duplicate Sample Analysis			<u>~</u>					
VII.	Laboratory Control Samples	s (LCS	)		LC	s			
VIII.	/III. Internal Standard (ICP-MS)			N	Not Utilized				
IX.	IX. Furnace Atomic Absorption QC			<u>N</u>	l l				
X.	C. ICP Serial Dilution			N	Not variand for Loud 2A				
XI.	XI. Sample Result Verification			N	<u> </u>				
XII.	(II. Overall Assessment of Data			Δ_					
XIII.	Field Duplicates			50	D= 12+14				
XIV.	. Field Blanks			<u>~</u>		·			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	Э	R = Rin	o compound: sate eld blank	ls detecte	ed	D = Duplicate TB = Trip blank EB = Equipment b	olank	
Validat	red Samples:	<u>, , , , , , , , , , , , , , , , , , , </u>	يم لـ						
1	M-87	11	M-36		2	1		31	
2	<b>M</b> -70	12	M-84		2	2		32	
3	M-71	13	M-10		2	3		33	
4	M-72	14	MD-2 5		2	4		34	
5	M-38	15	M-100		2	5		35	
6	M-22A	16	M-84MS		2	6		36	
7	M-89	17	M-84MSD		2	7		37	
8	M-17A	18	MB		2	8		38	inenes are a constant
9	M-115	19	_		2	9		39	
10	M-14A	20			3	0		40	
Notes		120	1			<u> </u>		140 1	

Date: 7 10 09

LDC#:	21107H4	
SDG#:	See Cover	

### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u> 1 of 1</u>
Reviewer:	Al
nd Reviewer:	~~

METHOD: Metals (EPA Method 6010B)

YN NA (Y)N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentr	(530)	
Compound	12	14	( <del>&lt; 30</del> ) RPD
Chromium	0.065	0.067	3 2/

V:\FIELD DUPLICATES\FD\_inorganic\21107H4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 11, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250388

#### Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

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PC-133

ART-9 PC-117MS

PC-117MSD

#### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 250388

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 250388

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 250388

No Sample Data Qualified in this SDG

SDG # .abora <b>//ETH</b> The sa	:21107l4 ::_250388 atory:_MWH Laboratories OD: Chromium (EPA SV amples listed below were ion findings worksheets.	V 846	- Method 60	10B)	PLETENESS WORI Stage 2A ollowing validation area		Date: 구 ( ) ( ) Page: \( \) of \( \) Reviewer: \( \) 2nd Reviewer: \( \) \( \) are noted in attached
anuat	Validation	Area				Comments	
l.	Technical holding times			A	Sampling dates: %	8c / ,	
———— II.	Calibration			N			
 III.	Blanks			A			
IV.	ICP Interference Check Sam	nple (IC	S) Analysis	N			
V.	Matrix Spike Analysis	1		Α	RMSIMSD		
VI.	Duplicate Sample Analysis			N	'		
VII.	Laboratory Control Samples	(LCS)		<u> </u>	LCS		
VIII.	Internal Standard (ICP-MS)			N	Not Mt:1: Fa	<u> </u>	
IX.	Furnace Atomic Absorption	QC		2	L L		
Χ.	ICP Serial Dilution			N	Not review	for Land	2A
XI.	Sample Result Verification			N			
XII.	Overall Assessment of Data	<u> </u>		A			
XIII.	Field Duplicates			7			
XIV.	Field Blanks	<u> </u>		$\sim$			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	<b>;</b>	R = Rins	o compound sate eld blank	TB = T	plicate rip blank quipment blank	
<u>г</u>	AL	<u> </u>	Ye L			T	
1	ART-1	11	PC-117		21	31	
2	ART-2	12	PC-118		22	32	
3	ART-3	13	PC-119		23	33	
4	ART-4	14	PC-120		24	34	
5	ART-7	15	PC-121	·	25	35	
6	ART-8	16	PC-133		26	36	
7	PC-99R2/R3	17	ART-9		27	37	
8	PC-115R	18	PC-117MS		28	38	
9	PC-116R	19	PC-117MSD		29	39	
10	SF-1	20	MB		30	40	

Notes:\_

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 13, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250906

Sample Identification

H-28A

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

The sam	D: Chromium (EPA SW uples listed below were ren findings worksheets.  Validation A							
The sam	n findings worksheets.	eviewed for e	ach of the fo					
	Validation A			ollowing	validatio	on areas. V	alidation findin	igs are noted in attached
	Valluation A	rea					Comments	
i. T	Fechnical holding times		A	Sampling	dates:	8/13	108	
II. C	Calibration		N					
III. E	Blanks		A		·			
IV. 10	CP Interference Check Samp	le (ICS) Analysis	N N					
V. N	Matrix Spike Analysis		4	1 t	v ~ 2	250388		
VI. [	Duplicate Sample Analysis		12					
VII. L	Laboratory Control Samples (L	_CS)		LLS				
VIII. I	Internal Standard (ICP-MS)		N	100+	<u>U1</u>	tilizad		
IX. F	Furnace Atomic Absorption Q	C	2	\ \ \_		<u> </u>		
X. I	ICP Serial Dilution		N	No+	· vwi	1 sun	_ Lml 2	2- A
XI. S	Sample Result Verification		N					
XII. (	Overall Assessment of Data		A					
XIII. F	Field Duplicates		<u> </u>					
XIV. I	Field Blanks		<u>                                     </u>		-			
	A = Acceptable N = Not provided/applicable SW = See worksheet	R = F	No compound Rinsate Field blank	ds detected	d	D = Duplicat TB = Trip bla EB = Equipr	ank	
Validated	Samples:	L web						
1 H-	-28A	11		21			31	
2 N	18	12		22	2		32	
3		13		23	3		33	
4		14		24	4		34	
5		15		25	5		35	
6		16		26	3		36	
7		17		2	7		37	
8		18		28	в 📗		38	
9		19		25	9		39	
10		20		3(	0		40	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 11 through August 14, 2008

LDC Report Date:

July 28, 2009

**Matrix:** 

Water

Parameters:

Chromium

Validation Level:

Stage 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 251027

#### Sample Identification

PC-55 PC-58 PC-56 PC-60 PC-59 PC-62 PC-68 PC-97 PC-86 PC-90 PC-91 PC-17 PC-18 MW-K4 MW-K5 PC-53 PC-103 PC-98R M-87 L-635 L-637 PC-86MS PC-86MSD MW-K4MS

MW-K4MSD

PC-134 PC-135

ARP-1

PC-133

ARP-6B

ARP-5A

ARP-4A

#### Introduction

This data review covers 32 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### 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.

#### IV. Blanks

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

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### 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 this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

#### XII. Sample Result Verification

All sample result verifications were acceptable.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 251027

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 251027

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 251027

No Sample Data Qualified in this SDG

#### VALIDATION COMPLETENESS WORKSHEET LDC #: 21107K4 Stage 4 SDG #: 251027 Laboratory: MWH Laboratories

Date: 7/28/5)
Page: 1/of/
Reviewer:
2nd Reviewer:
./

METHOD: Chromium (EPA SW 846 Method 6010B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 8/11/98 - 8//4[98
II.	Calibration	A	
111.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	> M5/M35
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	Les/usp Int utility
VIII.	Internal Standard (ICP-MS)	N	Int utilizes
IX.	Furnace Atomic Absorption QC	N	, ,
X.	ICP Serial Dilution	N	Nit performed
XI.	Sample Result Verification	A	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

√alida	ted Samples:	M					<u>~</u>
1	PC-55	11	PC-91	21	MWK4 MW-K4	31	HB
2	PC-58	12	PC-17	22	MW-KC	32	14W-K4 M5
3	PC-56	13	PC-18	23	PC-53	33	J viso
4	PC-60	14	ARP-1	24	PC-103	34	MB
5	PC-59	15	PC-134	25	PC-98R	35	
6	PC-62	16	PC-135	26	M-87	36	
7	PC-68	17	PC-122	27	L-635	37	
8 <b>W</b>	PC-97	18	ARP-6B	28	L-637	38	
9 7	PC-86	19	ARP-5A	29	PC-86MS	39	
10	PC-90	20	ARP-4A	30	PC-86MSD	40	

Notes:	

## LDC #: 1109 KY SDG #: 1277

#### **VALIDATION FINDINGS CHECKLIST**

Page: \_\_\_\_of \_\_\_\_ Reviewer: \_\_\_\_\_\_\_ 2nd Reviewer: \_\_\_\_\_\_\_

Method: Metals (EPA SW 846 Method 6010B/7000/6020)

Method:Metals (EPA SW 846 Method 6010B/7000/6020)	,			
Validation Area	Yes	No	NA	Findings/Comments
All technical holding times were met.	<b>V</b>			
Cooler temperature criteria was met.	1			
Were all isotopes in the tuning solution mass resolution within 0.1 amu?				
Were %RSD of isotopes in the tuning solution ≤5%?			/	
Were all instruments calibrated daily, each set-up time?	1			
Were the proper number of standards used?	_			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	1			
Were all initial calibration correlation coefficients > 0.995?	/			
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks		/		
validation completeness worksheet.				
Were ICP interference check samples performed daily?	/		- DOWNER	e kur (d. 1985) i deziminalitzak da danen eza eza eza eta eta eza eta eta eta eta eta eta eta eta eta et
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	/			
		st.		
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	1			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	1			
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	1			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	/			

#### **VALIDATION FINDINGS CHECKLIST**

Page: Yof Yeviewer: 2nd Reviewer: 4

Validation Area	Yes	No	NA	Findings/Comments
Validation Acts				Findings/Comments
If MSA was performed, was the correlation coefficients > 0.995?			/	
Do all applicable analysies have duplicate injections? (Level IV only)			/	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)				
Were analytical spike recoveries within the 85-115% OC limits?			_/	
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		1		
Were all percent differences (%Ds) < 10%?			/	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			/	
Residual Carlo o del como en esta Media Media del Carlo				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			/	
If the %Rs were outside the criteria, was a reanalysis performed?	S OF MANY		/	
calling the transfer of the Charles and Stellar Sound and				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				
	414.10			
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1			
Overall assessment of data was found to be acceptable.	7			
The state of the s				
Field duplicate pairs were identified in this SDG.		V		
Target analytes were detected in the field duplicates.				
Field blanks were identified in this SDG.				
Target analytes were detected in the field blanks.			1	

100 #: - 100 / SDG #: - 2010 /

# VALIDATION FINDINGS WORKSHEET Initial and Continuing Calibration Calculation Verification

Page: Of Reviewer: WY

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found × 100 True

Where, Found a concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution True = concentration (in ug/L) of each analyte in the ICV or CCV source

Element Found (ug/L) True (ug/L)  (v						Becalculated	Reported	
ICP (Initial calibration)	Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	%R	%R	Acceptable (Y/N)
GFAA (initial calibration)  CVAA (initial calibration)  (CVAA (initial calibration)  GFAA (Continuing calibration)  CVAA (Continuing calibration)  (CVAA (Continuing calibration)  (CVAA (Continuing calibration)		ICP (initial calibration)	3	ح.ه)	٥)	ره ک	3	>
CVAA (initial calibration)  ICP (Continuing calibration)  GFAA (Continuing calibration)  CVAA (Continuing calibration)  ICP/MS (initial calibration)		GFAA (initial calibration)						
GFAA (Continuing calibration)  CVAÄ (Continuing calibration)  ICP/MS (initial calibration)		CVAA (initial calibration)						
GFAA (Continuing calibration)  CVAA (Continuing calibration)  ICP/MS (Initial calibration)	3	ICP (Continuing calibration)	3	28	o.1	۲۵)	( ° )	À
CVAA (Continuing calibration) (CP/MS (initial calibration)		GFAA (Continuing calibration)				,		,
ICP/MS (initial calibration)		CVAA (Continuing calibration)						
(wolfettles coloration), 24 CO.		ICP/MS (Initial calibration)						
		ICP/MS (Continuing calibation)						

Comments: Refer to Calibration Verification fludings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: MOJ KY SDG #: 25/22

# VALIDATION FINDINGS WORKSHEET **Level IV Recalculation Worksheet**

Page: \_\_\_of\_\_ 2nd Reviewer: Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result).

True = Concentration of each analyte in the source. %R = Found × 100 True

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| × 100 (S+D)/2

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = 1-SDR × 100

Where, I = Initial Sample Result (mg/L) SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

					Recalculated	Reported	
Samole ID	Type of Analysis	Element	Found / S / 1 (units)	True / D / SDR (units)	%R/RPD/%D	%R/RPD/%D	Acceptable (Y/N)
Tusky	ICP interference check	S	ئىە	a Kio	こと	( e)	>
23	Laboratory control sample		0.970	٥٥٠)	97.0	9700	
کر	Matrix spike		2 P. O (SSR-SR)	000	960	676	
202 42	Duplicate	~	0,949	0,960	4	M	7
3	ICP serial dilution						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_	21/07KY
SDG #:_	Mosh

### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:	
Reviewer:	My
2nd reviewer:	4

		<del></del>		2nd reviewer:
METH	OD: Tra	ce Metals (EPA SW 846 Me	thod 6010/7000)	<i>V</i>
Please N N I N N I	<u>N/A</u> N/A	Have results been reporte	stions answered "N". Not applicable quest d and calculated correctly? orated range of the instruments and within ow the CRDL?	
Detecte followin			12, 13, 2/	_ were recalculated and verified using the
Concent	ation =	(RD)(FV)(Dil) (In. Vol.)(%S)	Recalculation:	
RD FV In. Vol. Dii %S	= = =	Raw data concentration Final volume (ml) Initial volume (ml) or weight (G) Dilution factor Decimal percent solids	#12 cv = 0.0419 W	1/LX2 = 0,083 4 mg/

Sample ID	Analyte	Reported Concentration ( WAL )	Calculated Concentration ( WfL )	Acceptable (Y/N)
12	Cr	0.083	0,063	Y
·				<u>'</u>
13		0.14	0.14	
*		0 .61	- 11	<del> </del>
21		0,04)	Q.4)	
		·		

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 18, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 251181

Sample Identification

ART-6

#### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### VI. Matrix Spike Analysis

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

#### VII. Duplicate Sample Analysis

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

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 251181

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 251181

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 251181

No Sample Data Qualified in this SDG

SDG # _abora	: 21107L4 : 251181 atory: <u>MWH Laboratories</u>	Date: ¬   c   s  Page: _ \ of \ Reviewer: _ \ \ 2nd Reviewer: _ \							
The sa	OD: Chromium (EPA SW amples listed below were tion findings worksheets.				ollowing	g val	idation areas. Validat	tion find	ings are noted in attached
	Validation A	Area					Com	ments	
I.	Technical holding times			^	Samplir	ng da	tes: 8   18   C	8	
II.	Calibration			N_					
111.	Blanks			A					
IV.	ICP Interference Check Sam	ple (IC	S) Analysis	N	ļ	<u>-</u>			
V.	Matrix Spike Analysis			2	Clint Specified				
VI.	Duplicate Sample Analysis			7					
VII.	Laboratory Control Samples	(LCS)		A	LCS				
VIII.	Internal Standard (ICP-MS)			N	Not Utilitud				
IX.	Furnace Atomic Absorption	QC		N					
X.	ICP Serial Dilution	••••		N	Not unimed for hard 2A				
XI.	Sample Result Verification			N	Ŭ				
XII.	Overall Assessment of Data			A					
XIII.	Field Duplicates			N					
XIV.	Field Blanks								
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	ı	R = Rin	lo compound nsate ield blank	ds detect	:ed	D = Duplicate TB = Trip blank EB = Equipment b	lank	
Validat	ted Samples:	<u>~~</u>	ــــــــــــــــــــــــــــــــــــــ						
1	ART-6	11_				21		31	
2	MB	12				22		32	
3		13			:	23		33	
4		14				24		34	
5		15				25		35	
6		16			:	26		36	
		17			].	27		37	

		tu wt			
1	ART-6	11	21	31	
2	MB	12	22	32	
3		13	23	33	
4		14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 3, 2008

LDC Report Date:

July 14, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258290

#### Sample Identification

I-AR

I-O

I-P

I-H

I-U I-T

I-G

ı-G

I-Q I-F

I-N

I-E

I-M

I-D

I-C

I-S

I-L

I-R I-B

I-ARMS

I-ARMSD

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-1 (from SDG 258305) was identified as a field blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Field Blank Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

SDG Labo	#: <u>21107Q4</u> #: <u>258290</u> ratory: <u>MWH Laboratorie</u> <b>HOD:</b> Chromium (EPA S	es	_	S	PLETEN Stage 2	NESS WOI	RKSHE	ET	Page: _ of _ Reviewer: _ A 2nd Reviewer:	
	samples listed below wer ation findings worksheets		ewed for ea	ch of the f	ollowing	validation are	eas. Valid	ation findi	ngs are noted in attached	
	Validation	n Area	<u> </u>		Comments					
1.	Technical holding times			A	Sampling dates: (\ 3   0 %					
<u>II.</u>	Calibration			N			•			
111.	Blanks			A						
IV.	ICP Interference Check Sa	mple (I	CS) Analysis	N						
<u>V.</u>	Matrix Spike Analysis			Α	1 m	SIMED	)			
VI.	Duplicate Sample Analysis	<b>.</b>		7						
VII.	Laboratory Control Sample	s (LCS	)	A	LLS					
VIII.	Internal Standard (ICP-MS	)		N	100 t	U+:1:3	ud			
IX.	Furnace Atomic Absorption	n QC		12						
X.	ICP Serial Dilution			N	Not reviewed for hul 2A					
XI.	Sample Result Verification			N	0					
XII.	Overall Assessment of Da	ta								
XIII.	Field Duplicates			7						
XIV.	Field Blanks			70	S FB: FB-1 (fm 258305)					
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le	R = Rin	o compound sate eld blank	s detected	TB = 1	uplicate Trip blank Equipment	blank		
Valida	ted Samples:		,							
			<u> </u>					<u> </u>		
1	I-AR	11	I-E		21	MB		31	···	
2	1-0	12	I-M		22			32		
3	I-P	13	I-D		23			33		
<u>4</u>	<u>I-H</u>	14	I-C		24			34		
5	I-U	15	I-S		25			35 36		
6 7	I-G	16	I-R		26 27			37	***************************************	
8	I-Q	18	I-B		28			38		
9	I-F	19	I-ARMS		29			39		
10	I-N	20	I-ARMSD		30			40		
النكيا		120	1.744.00		100			1,01		

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 3, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258305

#### Sample Identification

PC-123

PC-124

PC-125

PC-126

PC-127

PC-128

PC-131

PC-132

FB-1

M-96

PC-54

I-AA

M-66

M-65

M-64

MD-3

M-95

FB-1MS

FB-1MSD

#### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample FB-1 was identified as a field blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### 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-128 and MD-3 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	tion (mg/L)				
Analyte	PC-128	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	0.16	0.16	0 (≤30)	-	-	•

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258305

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258305

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 258305

No Sample Data Qualified in this SDG

LDC #: 21107R4 VALIDATIO  SDG #: 258305 Laboratory: MWH Laboratories					PLETE Stage 2		SS WORKSI	HEET	Date: ¬   »   » Page: ¬ of \ Reviewer: △
METI	HOD: Chromium (EPA S\	N 84	6 Method 60	)10B)					2nd Reviewer:
Tha s	amples listed below were	rovi	awad for aa	ch of the f	following	n val	idation areas M	/alidation findi	ngs are noted in attached
	ation findings worksheets.		ewed for ear	on or the r	ionowing	y vai	idation areas. V	andation in an	ngo are noted in attached
	Validation	Area		·		· · · · · · · · · · · · · · · · · · ·		Comments	
l.	Technical holding times			Α	Samplin	ng da	1	108	
11.	Calibration			N					
111.	Blanks			Α					
IV.	ICP Interference Check San	nple (I	CS) Analysis	N					
V.	Matrix Spike Analysis			A	7~	7-5	IMED		
VI.	Duplicate Sample Analysis			2					
VII.	Laboratory Control Samples	(LCS	)	Δ	ا ا	S			
VIII.	Internal Standard (ICP-MS)			N	N.	+	Ut: liza	d	
IX.	Furnace Atomic Absorption	QC	W 10 W 1	N	l	_	l		
Χ.	ICP Serial Dilution	."		N	N.	ŧ	review d.	for hund	20
XI.	Sample Result Verification			N				U	
XII.	Overall Assessment of Data	1		A					
XIII.	Field Duplicates			<b>5ω</b>	19:	ر) :	+16		
XIV.	Field Blanks			70	FB	<u>.</u> د	ገ		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	÷	R = Rin	o compound sate eld blank	ds detecte	ed	D = Duplicat TB = Trip bla EB = Equipn	ank	
/alida	red Samples:	u	w., <del>L</del>						
1	PC-123	11	PC-54		2	1		31	
2	PC-124	12	I-AA		2:		- 11 - 11 - 11 - 11 - 11 - 11 - 11 - 1	32	
3	PC-125	13	M-66		2			33	
4	PC-126	14	M-65		2			34	
5	PC-127	15	M-64		2			35	
6	PC-128 <sup>S</sup>	16	MD-3 <sup>5</sup>		20			36	
7	PC-131	17	M-95		2			37	
	20.400	10	ED 4140			$\uparrow$	<del> </del>		

10	M-96	20	MB	30	40	
Note	•					
INOLE	>					

19

FB-1MSD

29

39

LDC#:	21107R4
SDG#:	See Cover

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:	<u>\_of_\_</u>
Reviewer:	Al
2nd Reviewer:	

METHOD: Metals (EPA Method 6010B)

( N NA NN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra			
Compound	6	16	(≤ 30) RPD	
Chromium	0.16	0.16	0	

V:\FIELD DUPLICATES\FD\_inorganic\21107R4.wpd

## Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 4, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258410

## Sample Identification

PC-129

PC-130

PC-71

PC-72

PC-73

M-44

PC-37

M-48

MD-4

M-57A

EB-1 M-131

M-79

M-69

M-135

M-25

M-37

M-99

M-79MS

M-79MSD

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-1 was identified as a equipment blank. No chromium was found in this blank.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### 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-71 and MD-4 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentral	tion (mg/L)					
Analyte	PC-71 MD-4		RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	0.73	0.46	45 (≤30)	•	J (all detects)	А	

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258410

SDG	Sample	Analyte	Flag	A or P	Reason
258410	PC-71 MD-4	Chromium	J (all detects)	А	Field duplicates (RPD)

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258410

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Field Blank Data Qualification Summary - SDG 258410

No Sample Data Qualified in this SDG

SDG 7	DC #: 21107S4 VALIDATIOI DG #: 258410 aboratory: MWH Laboratories				LETEN tage 2/		KSHEET	Page: 1 of 1  Reviewer: 4  2nd Reviewer: 1	
The s	HOD: Chromium (EPA samples listed below we tion findings worksheet	re revi			ollowing v	/alidation area	as. Validation findir	ngs are noted in attached	
	Validatio	n Area					Comments		
l.	Technical holding times		Α	5	Sampling	dates: \\	14/28		
11.	Calibration			N					
111.	Blanks			A					
IV.	ICP Interference Check Sa	ample (I	CS) Analysis	N					
V.	Matrix Spike Analysis			Δ	12 M	2/M 50			
VI.	Duplicate Sample Analysis	3		N	١				
VII.	Laboratory Control Sample	es (LCS	)		LLS				
VIII.	Internal Standard (ICP-MS	S)		N	Not	ut: li	£~d		
IX.	Furnace Atomic Absorptio	n QC		2	l l				
X.	ICP Serial Dilution		<del></del>	N	Not reviewed for Lul 2A				
XI.	Sample Result Verification	1		N			U		
XII.	Overall Assessment of Da	ta		Δ_					
XIII.	Field Duplicates			SW	1>:	3+9			
XIV.	Field Blanks			20	EB:	11			
Note: Validat	A = Acceptable N = Not provided/applicab SW = See worksheet ed Samples:	ole	R = Rin	o compound: sate eld blank	s detected		iplicate rip blank quipment blank		
1	PC-129	11	EB-1		21	MB	31		
	PC-130	12	M-131		22		32		
	PC-71 D	13	M-79		23		33		
	PC-72	14	M-69		24		34		
5	PC-73	15	M-135		25		35		
6	M-44	16	M-25		26		36		
7	PC-37	17	M-37		27		37		
-	M-48	18	M-99		28		38		
9	MD-4 6	19	M-79MS		29		39		
II I	M-57A	20	M-79MSD		30		40		

LDC#:	21107S4
SDG#:	See Cover

#### **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

Page: of 1
Reviewer: 2nd Reviewer:

METHOD: Metals (EPA Method 6010B)

**ŶN NA ŶN NA** 

Were field duplicate pairs identified in this SDG?

NA Were target analytes detected in the field duplicate pairs?

	Concentra	4 - 00	Paun +	
Compound	3	9	(≤ 30) RPD	~~~
Chromium	0.73	0.46	45	ALLDE

(fd)

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## Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 5, 2008

**LDC Report Date:** 

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258563

## Sample Identification

M-92

MD-1

M-97

**M-10MS** M-10MSD

M-31A

M-52

M-50

M-34

M-35

M-19

M-39

M-68

M-61

I-K

I-J

I-Z **|-|** 

I-V

M-84

M-10

EB-2

M-11

#### Introduction

This data review covers 23 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

Sample EB-2 was identified as an equipment blank. No chromium was found in this blank.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

Samples M-11 and MD-1 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentrat	ion (mg/L)					
Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P	
Chromium	3.6	3.7	3 (≤30)	-	-	-	

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258563

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258563

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 258563

No Sample Data Qualified in this SDG

SDG a	#: <u>21107T4</u> #: <u>258563</u> atory: <u>MWH Laborator</u>	<del></del>	ALIDATIOI -		<b>LETEN</b> tage 2 <i>P</i>	ESS WORKS	HEET	Date: ¬   ೪   ɔ  Page: _ ' of _ \  Reviewer: \	
METH	IOD: Chromium (EPA	SW 84	6 Method 60	)10B)				2nd Reviewer:	
	amples listed below we tion findings workshee		ewed for ea	ch of the fo	ollowing v	alidation areas.	Validation findir	ngs are noted in attached	
	Validatio	on Area					Comments		
I.	Technical holding times		A	₩)	Sampling	dates: 11 5	108		
11.	Calibration			N Q	<b>\</b>	,	,		
111.	Blanks			$\triangle$					
IV.	ICP Interference Check S	Sample (I	CS) Analysis	N	- <u>-</u>				
V.	Matrix Spike Analysis		····	A	] Ms	5/M5D			
VI.	Duplicate Sample Analys	sis		<u>~</u>	1	·			
VII.	Laboratory Control Samp	oles (LCS	)	A	LLS				
VIII.	Internal Standard (ICP-M	IS)		N	Not Utilized				
IX.	Furnace Atomic Absorpti	7	l L						
Χ.	ICP Serial Dilution			N	Not reviewed for Lind 2A				
XI.	Sample Result Verification	on		N			U		
XII.	Overall Assessment of D	ata		Α					
XIII.	Field Duplicates			ا (س	1):20+21				
XIV.	Field Blanks			20	EB=	19			
Note:	A = Acceptable N = Not provided/applica SW = See worksheet	ble	R = Rins	o compounds sate eld blank	detected	D = Duplica TB = Trip b EB = Equip	lank		
validate	ed Samples:	<u>~</u> ~	· L						
1	<b>M</b> -92	11	M-61		21	MD-1	31		
2	<b>M</b> -97	12	I-K		22	M-10MS	32		
3	M-31A	13	I-J		23	M-10MSD	33	·	
4	M-52	14	I-Z		24	MB	34		
5	<b>M</b> -50	15	1-1		25		35		
6	M-34	16	I-V		26		36		
7	M-35	17	M-84		27		37		
8	M-19	18	M-10		28		38		
9	<b>M</b> -39		EB-2		29		39		
ا ۱۱	M-68	20	M-11 5		30	1	40		

Notes:\_\_

#### LDC#: 21107T4 SDG#: See Cover

## **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	`	_of_	1
Reviewer:	_	A	1
2nd Reviewer:	1	) \	

METHOD: Metals (EPA Method 6010B)

OY N NA **YN NA** 

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra			
Compound	20	21	(≤ 30) RPD	
Chromium	3.6	3.7	3	

V:\FIELD DUPLICATES\FD\_inorganic\21107T4.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 6, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258623

## Sample Identification

M-67

M-133

M-74

M-73

M-88

M-87

M-70

M-71

M-72

M-38

M-36

M-12A

M-100

M-22A

M-89

M-17A

MD-2

M-70MS

M-70MSD

#### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

## V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VIII. Laboratory Control Samples (LCS)

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

## IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples M-12A and MD-2 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)		1.1		
Analyte	M-12A	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
Chromium	13	13	0 (≤30)	-	-	•

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258623

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258623

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 258623

No Sample Data Qualified in this SDG

SDG Labo <b>MET</b> The s	#: 21107U4 #: 258623 ratory: MWH Laboratories  HOD: Chromium (EPA Stamples listed below were ation findings worksheets	s W 84 e revi		) () () ()	Stage	2A				2nd	Date: ¬   Page: _ \ \ Page: _ \ \ Reviewer: _ \ Reviewer: _ \ e noted in attac	of
T T	Validation	***************************************	· · · · · · · · · · · · · · · · · · ·						mments			
l.	Technical holding times	Alec	<del></del>	Α	Samp	oling d	ates: \\	161	2 <u>Z</u>			
II,	Calibration			N					•			
111.	Blanks			Α					, , ,			
IV.	ICP Interference Check Sar	nple (I	CS) Analysis	N								
V.	Matrix Spike Analysis			Α	7	M3	IMID					
VI.	Duplicate Sample Analysis			2			1					
VII.	Laboratory Control Samples	Laboratory Control Samples (LCS)			ار	2-						
VIII	. Internal Standard (ICP-MS)	Internal Standard (ICP-MS)			Not Whilized							
IX.	Furnace Atomic Absorption	Furnace Atomic Absorption QC			\ \							
X.	ICP Serial Dilution			N	<u>  ~</u>	Not variound for Lard 2A						
XI.	Sample Result Verification			N					U			
XII.	Overall Assessment of Data			Δ_							· · · · · · · · · · · · · · · · · · ·	
XIII	Field Duplicates			<u>5</u> w	2	= 1	2+17		<u> </u>			
XIV	Field Blanks			<u>~</u>					*****			
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:		R = Rin	o compound sate eld blank	s detec	eted	TB =	Duplicate Trip blank Equipment	blank			
1	M-67	11	M-36			21			31			
2	M-133	12	M-12A 5			22			32			
3	M-74	13	M-100			23			33			
4	M-73	14	M-22A			24			34			$ \parallel $
5	M-88	15	M-89			25			35			
6	M-87	16	M-17A			26			36			
7	<b>M</b> -70	17	MD-2 >			27		-	37			
e e	M_71	18	M-70MS			28	<u>-</u>		38		· · · · · · · · · · · · · · · · · · ·	

29

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39

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M-72

M-38

10

Notes:\_

19

M-70MSD

MB

LDC#:	21107U4	
SDG#:	See Cover	

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	١	_of_	1
Reviewer:_	<	1	Į.
2nd Reviewer:		_(	ک

METHOD: Metals (EPA Method 6010B)

N NA N NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	, . <b></b>	
Compound	12	17	(≤ 30) RPD	
Chromium	13	13	0	

V:\FIELD DUPLICATES\FD\_inorganic\21107U4.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 7, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258639

Sample Identification

M-76

M-75

M-115

M-14A

#### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

## 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

## XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

No field duplicates were identified in this SDG.

## 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

SDG	#:21107V4 #:_258639 ratory:_MWH_Laboratorie	_		PLETENE: Stage 2A	SS WORKSHEE		Date: → ( * ) → Page: → of → Reviewer: → nd Reviewer: →				
MET	HOD: Chromium (EPA S	SW 846 Method 6	010B)			2	rid (Ceviewer				
	samples listed below wer ation findings worksheets		och of the f	ollowing vali	dation areas. Validat	tion findings	are noted in attached				
	Validatio	n Area		Comments							
<u>l.</u>	Technical holding times			Sampling dat	es: 11 ] 7   3	8					
11.	Calibration		N		, ,						
111.	Blanks		Δ								
IV.	ICP Interference Check Sa	ample (ICS) Analysis	N								
<u>V.</u>	Matrix Spike Analysis		A	7 f-	258623						
VI.	Duplicate Sample Analysis	<u> </u>	1	<u> </u>							
VII.	Laboratory Control Sample	es (LCS)	Δ	ادع							
VIII	. Internal Standard (ICP-MS	5)	N	Not	Utilized						
IX.	Furnace Atomic Absorption	n QC	1	L	l						
X.	ICP Serial Dilution		N	Not,	minul for	Lul 2	Α				
XI.	Sample Result Verification	1	N								
XII.	Overall Assessment of Da	ta	<u> </u>			· · · · · · · · · · · · · · · · · · ·					
XIII	. Field Duplicates		<u>  ~ </u>								
XIV	. Field Blanks		<u>  2</u>								
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le R = Rir	lo compound nsate ield blank	s detected	D = Duplicate TB = Trip blank EB = Equipment bl	ank					
Valida	ited Samples:	en act									
1	M-76	111		21		31					
2	M-75	12		22		32					
3	M-115	13		23		33					
4	M-14A	14		24		34					
5	MB	15		25		35					
6		16		26		36					
7		17		27		37					
8		18		28		38					
9		19		29		39					
10		20		30		40					
Note	0.										

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 10, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258779

## Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

SF-1MS

SF-1MSD

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Chromium - Laboratory Blank Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

SDC	C#:21107W4 G#:_258779 oratory:_MWH Laborator	ALIDATIO 		PLETEN Stage 2/	IESS WOR	KSHEET	Date: ¬   ¬   ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬ ¬					
MET	THOD: Chromium (EPA	SW 84	46 Method 6	010B)				Zild Neviewer.				
The valid	samples listed below we dation findings workshee	ere rev ts.	iewed for ea	ch of the f	following v	validation are	as. Validation find	ings are noted in attached				
	Validatio	n Are	a				Comments					
1.	Technical holding times			A	Sampling	dates: \\	10/08					
- 11.				N		· · · · · · · · · · · · · · · · · · ·						
	. Blanks			Δ								
IV	. ICP Interference Check S	ample (	ICS) Analysis	N								
V	. Matrix Spike Analysis			A	7 m	72 M 2						
VI	. Duplicate Sample Analysi	s		2								
VI	I. Laboratory Control Sampl	es (LCS	6)	A	LLS							
VII	I. Internal Standard (ICP-MS	5)		N	100 t	ut:1	: Ł_4 :					
IX	. Furnace Atomic Absorption	Furnace Atomic Absorption QC										
<u>X</u>	ICP Serial Dilution	ICP Serial Dilution				Not resigned for had 2A						
XI	. Sample Result Verification	Sample Result Verification				U						
XII	. Overall Assessment of Da	ıta		Δ								
XII	I. Field Duplicates			7								
ΧI\	/. Field Blanks			<u> </u>								
Note:	A = Acceptable N = Not provided/applicat SW = See worksheet	ole	R = Rin	o compound: sate eld blank	s detected	D = Du TB = Tr EB = E	plicate ip blank quipment blank					
Valida	ated Samples:											
1	ART-1	T										
1		11	SF-1		21	MB	31					
2	ART-2	12	PC-117		22		32					
3	ART-3 ART-4	13	PC-118 PC-119		23		33					
4	ART-6				24		34					
5 6	ART-7	15 16	PC-120 PC-121		25		35					
7	ART-8	17	PC-121		26 27		36					
8	PC-99R2/R3	18	ART-9		28		37					
9	PC-115R	19	SF-1MS		29		38					
10	PC-116R	20	SF-1MSD		30		40					
Note			,			1	140					

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 10 through November 12, 2008

LDC Report Date:

July 9, 2009

Matrix:

Water

Parameters:

Chromium

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 259063

#### Sample Identification

M-87
PC-98R
PC-86
PC-90
PC-56
PC-58
PC-59
PC-60

PC-18 PC-55 L-635 L-637

PC-97

ARP-5AMS ARP-5AMSD

PC-62

PC-68

PC-122

MW-K4

ARP-1

ARP-4A

ARP-5A ARP-6B

PC-53

PC-103

MW-K5

PC-91

#### Introduction

This data review covers 27 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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 this SDG.

#### III. Calibration

Calibration data were not reviewed for Stage 2A.

#### IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the preparation blanks.

No field blanks were identified in this SDG.

#### V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis data were not reviewed for Stage 2A.

#### 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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VIII. Laboratory Control Samples (LCS)

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

#### IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

#### X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

#### XI. ICP Serial Dilution

ICP serial dilution analysis data were not reviewed for Stage 2A.

#### XII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### XIII. Overall Assessment of Data

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

#### XIV. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Chromium - Data Qualification Summary - SDG 259063

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Chromium - Laboratory Blank Data Qualification Summary - SDG 259063

No Sample Data Qualified in this SDG

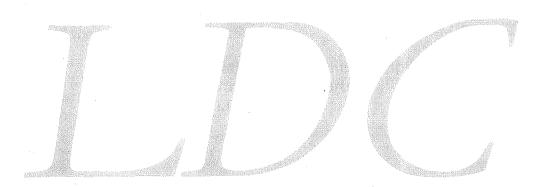
2008 Annual Remedial Performance Sampling Chromium - Field Blank Data Qualification Summary - SDG 259063

No Sample Data Qualified in this SDG

SDG ; Labor <b>METH</b> The s	t: 21107X4  t: 259063  atory: MWH Laboratories  IOD: Chromium (EPA S)  amples listed below were tion findings worksheets	W 846	- 6 Method 60	)10B)	tage	2A			Date: ¬ / » / .  Page: _, of _,  Reviewer:  2nd Reviewer:  ags are noted in attached	
	Validation	Area						Comments		
I.	Technical holding times			Δ	Sampli	ing d	ates: (\\ lo	- 11/12/	08	
11.	Calibration			N				•		
111.	Blanks			Δ						
IV.	ICP Interference Check Sar	nple (l	CS) Analysis	N						
V.	Matrix Spike Analysis			$\triangle$	} ^	Λ,	IMSD			
VI.	Duplicate Sample Analysis	***************************************		2			· · · · · · · · · · · · · · · · · · ·			
VII.	Laboratory Control Samples	(LCS	)	Δ	LC	·S				
VIII.	Internal Standard (ICP-MS)			N	Not Utilized					
IX.	Furnace Atomic Absorption QC			N	l l					
Χ.	ICP Serial Dilution			N	Not rememb for Loud 2A					
XI.	Sample Result Verification			N				U		
XII.	Overall Assessment of Data	1		Α_						
XIII.	Field Duplicates			N						
XIV.	Field Blanks			7						
Note: √alidat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R = Rin	o compounds sate eld blank	s detect	ted	D = Duplicate TB = Trip blar EB = Equipm	nk		
1	M-87	11	PC-122			21	PC-97	31		
1 2 3 4	PC-98R	12	MW-K4				PC-18	32		
3	PC-86	13	ARP-1		1		PC-55	33		
4	PC-90	14	ARP-4A		1	24	L-635	34		
5	PC-56	15	ARP-5A		2	25	L-637	35		
5 6	PC-58	16	ARP-6B			26	ARP-5AMS	36		
	PC-59	17	PC-53			27	ARP-5AMSD	37		
8	PC-60	18	PC-103		]	28	MB	38		
9	PC-62	19	MW-K5			29		39		
10	PC-68	20	PC-91			30		40		

# 2008 Annual Remedial Performance Sampling Data Validation Reports LDC# 21107

Wet Chemistry



# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

July 14 through July 17, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 248147

#### Sample Identification

M-87 PC-97
PC-98R PC-17
PC-86 PC-18
PC-90 PC-55
PC-56 L-635
PC-58 L-637

PC-59

PC-60

PC-62

PC-68

PC-122

MW-K4

ARP-1

ARP-4A

ARP-5A

ARP-6B

PC-53

PC-103

MW-K5

PC-91

#### Introduction

This data review covers 27 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 248147

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 248147

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 248147

No Sample Data Qualified in this SDG

#### **VALIDATION COMPLETENESS WORKSHEET** LDC #: 21107A6 Stage 2A SDG #: 248147 Reviewer:\_\_A Laboratory: MWH Laboratories 2nd Reviewer: METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) SM 2540と) The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets. Comments Validation Area Sampling dates: Technical holding times Ν lla. Initial calibration Ν IIb. Calibration verification Δ III. Blanks Matrix Spike/Matrix Spike Duplicates IV V **Duplicates** Laboratory control samples LS | LLSD VI. Sample result verification Ν VII. VIII. Overall assessment of data Field duplicates Field blanks D = Duplicate A = Acceptable ND = No compounds detected Note: R = Rinsate TB = Trip blank N = Not provided/applicable EB = Equipment blank SW = See worksheet FB = Field blank Validated Samples: MA Wat

		WA	<del>~</del>			
1	M-87	11	PC-122	21	PC-97	31
2	PC-98R	12	MAKA MW-K4	22	PC-17	32
3	PC-86	13	ARP-1	23	PC-18	33
4	PC-90	14	ARP-4A	24	PC-55	34
5	PC-56	15	ARP-5A	25	L-635	35
6	PC-58	16	ARP-6B	26	L-637	36
7	PC-59	17	PC-53	27	PB	37
8	PC-60	18	PC-103	28		38
9	PC-62	19	MWK5 MW-K5	29		39
10	PC-68	20	PC-91	30		40

Notes:	

LDC #: 21107A6 SDG #: 248147

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:\_\_\_of\_\_ Reviewer:\_\_\_\_\_\_ 2nd reviewer:\_\_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	<u>Matrix</u>	Parameter
1-26	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 > 1)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 4, 2008

**LDC Report Date:** 

July 28, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A & 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249697

#### Sample Identification

PC-123 PC-124 PC-125 PC-126 PC-127\*\* PC-128\*\* PC-129\*\* PC-130\*\* PC-131\*\* FB-1 MD-3 MD-4 PC-124MS PC-124MSD PC-124DUP FB-1MS FB-1MSD MD-3DUP

PC-132\*\* M-96\*\*

PC-54\*\*

M-48\*\*

PC-71\*\*

PC-72\*\*

PC-73\*\*

PC-37\*\*

M-23\*\*

M-95\*\*

M-44\*\*

<sup>\*\*</sup>Indicates sample underwent Stage 4 review

#### Introduction

This data review covers 29 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a Stage 4 review. A Stage 2A review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Stage 2A criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-95**	Hexavalent chromium	31.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-44** FB-1 FB-1MS FB-1MSD	Hexavalent chromium	32 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

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

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB-1 was identified as a field blank. No contaminant concentrations were found in this blank.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. 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.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples PC-71\*\* and MD-3 and samples M-23\*\* and MD-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration					
Analyte	PC-71**	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	8270 mg/L	8050 mg/L	3 (≤30)	-	-	-	
Perchlorate	468000 ug/L	451000 ug/L	4 (≤30)	-	-	•	

	Concer	ntration					
Analyte	M-23**	MD-4	RPD (Limits)	Difference (Limits)	Flag	A or P	
Total dissolved solids	5260 mg/L	4720 mg/L	11 (≤30)	-	-	-	
Perchlorate	493000 ug/L	514000 ug/L	4 (≤30)	-	-	-	

### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 249697

SDG	Sample	Analyte	Flag	A or P	Reason	
249697	M-95** M-44** FB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times	

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 249697

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 249697

No Sample Data Qualified in this SDG

				.~						
SDG: Labor METH Metho	#: 21107B6 #: 249697 ratory: MWH Laboratories HOD: (Analyte) Hexave and 160.1 (In 1540 C)	alent e revie	Chromium	St	age 2A/	od 7196), Perchlo	orate (EPA M			
valida	tion findings worksheets.			T	1					
	<u>Validation</u>	Area				0/1.1.0	<u>Comments</u>			
1	Technical holding times			SW	Sampling	1,1_0	······································			
lla.	Initial calibration			A	1	ved for Level 2A valida				
IIb.	Calibration verification			A	Not reviewed for Level 2A validation.					
111.	III. Blanks				1					
IV.	Matrix Spike/Matrix Spike D	uplicat	es	<u>A</u>	3 m5/m50/wap					
V	Duplicates			A						
VI.	Laboratory control samples			A	Lustesp					
VII.	Sample result verification			A	Not reviewed for Level 2A validation.					
VIII.	Overall assessment of data			A						
IX.	Field duplicates			SW	(14	(2) (18,	γ <b>3</b> )			
x	Field blanks			1~9	FB-	2				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip bla EB = Equipm	nk				
Validat	ted Samples: ** Indicates sam	ple und	derwent Stage	4 validation						
1	PC-123	11	M-96**		21	FB-1 <b>⊀</b>	31			
2	PC-124	12	PC-54**		22	MD-3	32			
3	PC-125	13	M-48**		23	MD-4	33			
4	PC-126	149	PC-71**		24	PC-124MS	34			
5	PC-127	15	PC-72**		25	PC-124MSD	35			

PC-124DUP

FB-1MS

FB-1MSD

MD-3DUP

27

28

29

36

37

38

39

PC-73\*\*

PC-37\*\*

M-23\*\*

M-95\*\*

17

18

19

PC-128\*\*

PC-129\*\*

PC-130\*\*

PC-131\*\*

8

#### VALIDATION FINDINGS CHECKLIST

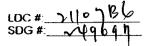
Page: 1 of 1 Reviewer: 444 2nd Reviewer: 9

Method: Inorganics (EPA Method See Cover Findings/Comments Validation Area Caracterist Location bines All technical holding times were met. Cooler temperature criteria was met Were all instruments calibrated daily, each set-up time? Were the proper number of standards used? Were all initial calibration correlation coefficients > 0.9957 Were all initial and continuing calibration verification %Rs within the 90-110% QC limits? Were titrant checks performed as required? (Level IV only) Were balance checks performed as required? (Level IV only) Was a method blank associated with every sample in this SDG? Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet. Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSO or MS/DUP, Soil / Water. Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. Were the MS/MSD or duplicate relative percent differences (RPD)  $\leq$  20% for waters and < 35% for soil samples? A control limit of < CROL(< 2X CROL for soil) was used for samples that were < 5X the CRDL, including when only one of the duplicate sample values were 55X the CRO Was an LCS anaytzed for this SDG? Was an LCS analyzed per extraction batch? Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?

N. Research Parks, Control and Equality Control

Were performance evaluation (PE) samples performed?

Were the performance evaluation (PF) samples within the acceptance limits?



#### VALIDATION FINDINGS CHECKLIST

Page: Yof Y Reviewer: MM 2nd Reviewer: 4

Validation Area	Yes	No	NA	Findings/Comments
VIII Sample constitution and			1	in the state of th
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	8			
Were detection limits < RL?	V			
Overall assessment of data was found to be acceptable.	1			
Field duplicate pairs were identified in this SDG.				
Target analytes were detected in the field duplicates.	/			
Field blanks were identified in this SDG.	\	1		
Target analytes were detected in the field blanks.		$\checkmark$		

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	
Reviewer:	<u> wu</u>
2nd reviewer:	
•	

All circled methods are applicable to each sample.

	Parameter
Sample ID	
1-43	pH dbs/ci F No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Fo <sub>4</sub> ALK Cit Ni <sub>3</sub> Not 150 Si
19-21	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CP)+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR
M 28	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR)**
21 26	ph 103 CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
,	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	ph tds ci f NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	ph tds ci f No, No, so, Po, alk cn NH, tkn toc crot
	pH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	ph tds ci f No, No, So, Po, Alk CN NH, TKN TOC CR
	ph tos ci f No, No, SO, PO, ALK CN' NH, TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	ph tds ci f No, No, So, Po, Alk CN' NH, TKN TOC CRª+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRS+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRª+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR°+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CROT
	PH TOS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRe+
	PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR°+

Comments:	

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

2nd reviewer:

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to the difference of the control Were all samples preserved as applicable to each method? Were all cooler temperatures within validation criteria?

	Qualifier
Technical holding time:  Sampling Analysis	
Technical holding time:  Sampling Analysis	
Sample ID date date date date date	
(9 8/41.9 8/5/) (802 (3),54-)	J/NJ/P
1010 (32hr)	/ 8/3/
V   -7, -8   1001 V	/
	·
	Wife
	7700

LDC#	21107B6
SDG#:	See Cover

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_		
Reviewer:	سسًا `	_
2nd Reviewer:	h	
-		

Inorganics, Method See Cover

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	(< 30)	
Analyte	14	22	(≤ 30) RPD	
TDS	8270	8050	3	
Perchlorate (ug/L)	468000	451000	4	

	Concentra	tion (mg/L)	(< 30)	
Analyte	18	23	(≤ 30) RPD	
TDS	5260	4720	11	
Perchlorate (ug/L)	493000	514000	4	

V:\FIELD DUPLICATES\FD\_inorganic\21107B6.wpd

SDG #:  $\frac{|0|}{\sqrt{969}}$ 

# Validatin Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of Language Seviewer: 2nd Reviewer: 2n

Method: Inorganics, Method ما المالية 
The correlation coefficient (r) for the calibration of  $\frac{abc}{abc}$  was recalculated.Calibration date:  $\frac{g/t/\cdot g}{abc}$ 

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = <u>Found X 100</u> True

Where, F

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Abs	r or r²	r or r²	(V/N)
Initial calibration		s1	0	0			
	Cr (VI)	\$2	0.005	0.01	0.99997	N N	
		s3	0.02	0.037			>
		84	0.05	0.099			_
		s5	0.2	0.389			
		9s	0.5	0.955			
Calibration verification	$a^{44}$	2500	) Ford		70)	8-)	b
$\mathcal{L} \mathcal{J}$ Calibration verification	Leoy	Ø	15.bv		520)	100,5	
Calibration varification							
כמוווים אכווווים אייוים אייים							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

DC #: ~110786

# VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Reviewer: Page:

METHOD: Inorganics, Method

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found × 100 Where, True

Found \*

True =

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = <u>15-D1</u> × 100 Where, (S+D)/2

Original sample concentration Duplicate sample concentration

# # O O

					Receipted	Reported	
Sample 10	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R/RPD	Acceptable (Y/N)
145	Laboratory control sample	\$3	(500)	<b>65.</b> "	\(\frac{\zeta}{\ell}\)	١. ه	<b>/</b>
7	Matrix spike sample	ten	(SSR-BR)	\$	9.007	1007	
8	Duplicate sample	Sat.	7619	<i>§</i> 81)	م	7.0	<u> </u>

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results

LDC #:	×110°	طرقا إ
SDG #:	~ 49	697

## VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	101
Reviewer:	MH
nd reviewer:	0-
-	7

METHOD: Inorgar	nics, Method	See cour	
M N N/A H	ave results been repo	orted and calculated co- alibrated range of the in	Not applicable questions are identified as "N/A". rectly? rstruments?
Compound (analy		6, 19	reported with a positive detect were
Concentration =	Ann (63)	Recalculation: 人, ト	alt = 0.103 x 2000 = 20/050 mg/

	Sample 10	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
H	6	(1/4) for	198000	20/000	Y
-	2	(104 (mg/L)	198000	5620	V
	, 9	COA ( (Mg/)	(08 00)	488000	4
2	()	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	1~3	1.3	
		Cloy (Mg/L)  Co+ (Mg/L)  To3	7390	1430	y
	·				<u> </u>
					· · ·
-					
-					
				-	

Note:_	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249779

Sample Identification

M-5A

M-6A

M-7B

M-5ADUP

#### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-6A	Total dissolved solids	13 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

#### VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 249779

SDG	Sample	Analyte	Flag	A or P	Reason
249779	M-6A	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 249779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 249779

No Sample Data Qualified in this SDG

SDG #: Labora	: 249779 atory: <u>MWH Laboratories</u>				stage 2A						Date: ¬ ( 6   Page: _ of _ Reviewer: 2nd Reviewer:
METH	OD: (Analyte) Perchlora	<u>ate (</u> E	EPA Metho	od 314.0), 7	rds (EPA	Method	<u>1 16</u>	30.1)	5M2	८५०	<u>_</u>
The sa validati	amples listed below were ion findings worksheets.	revie	wed for ea	ch of the fo	ollowing va	ılidation	are	=as. \	√alidatio	on find	lings are noted in attached
	Validation A	Area.							Comm	nents	
I.	Technical holding times			500	Sampling da	ates:	8	5	108		
lla.	Initial calibration			N				<u> </u>			
IIb.	Calibration verification			N_							
111.	Blanks			A							
IV	Matrix Spike/Matrix Spike Du	uplicate	<u> </u>	2	Du	<del>-5</del>		a-v-m-			
V	Duplicates			A							
VI.	Laboratory control samples			A_	LC5 /	LC8	^				
VII.	Sample result verification			N							Address of the second
VIII.	Overall assessment of data										
IX.	Field duplicates			<u>  ~ </u>							
_x_	Field blanks			<u></u>	<u></u>						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rir	No compound insate Field blank	s detected	Т	TB =	Duplica = Trip b = Equip		ınk	
Validate	ed Samples:	٠.٨									
1	M-5A	11			21					31	
	M-6A ·	12			22					32	
	M-7B	13			23					33	

		All ant			
1	M-5A	11	21	31	
2	M-6A	12	22	32	
3	M-7B	13	23	33	
4	M-5ADUP	14	24	34	
5	PB	15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:	

LDC #: 2110766 SDG #: 249779

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
		pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1)
	$\omega$	
2-3	w	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2-3	<u> </u>	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1 4		pH (TDS)CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f no <sub>3</sub> no <sub>2</sub> so <sub>4</sub> po <sub>4</sub> alk cn <sup>-</sup> nh <sub>3</sub> tkn toc cr <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:		
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LDC #: 21107C6 SDG #: 249779

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: <u>\</u> of_	1	_
Reviewer: 📣		_
2nd reviewer: 1	$\sim$	/

All circled dates have exceeded the technical holding time.

(Y) N N/A Were all cooler temperatures within validation criteria? 5M2540C Method: Parameters: Technical holding time: **Analysis Analysis** Analysis **Analysis** Sampling **Analysis** date date Qualifier date date date date Sample ID J-103/P (h) (13 days 8 2 08 08 18 2

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249900

# Sample Identification

I-O

I-P

I-H

I-U

I-T I-G

I-Q

I-F

I-N

I-E

I-M I-D

1-12

I-C I-S

I-L

I-R

I-B

I-AR

**I-FDUP** 

#### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 (from SDG 249949) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	8/5/09	Perchlorate Total dissolved solids	255 ug/L 18 mg/L	All samples in SDG 249900

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

# IV. 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.

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 249900

No Sample Data Qualified in this SDG

#### LDC #: 21107D6

# **VALIDATION COMPLETENESS WORKSHEET**

Stage 2A

SDG #: 249900	
Laboratory: MWH	Laboratories

Date: 7 16 109 Page: vof v

Reviewer: A 2nd Reviewer: 1/

METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) スペンショック

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	$\triangle$	Sampling dates: 8 \ 5 \ 0 \ S
IIa.	Initial calibration	N	
llb.	Calibration verification	N	
111.	Blanks		
IV	Matrix Spike/Matrix Spike Duplicates		( Dup (Ms/MSD for 249949)
V	Duplicates	A	
VI.	Laboratory control samples		LUS LUSO
VII.	Sample result verification	N N	·
VIII.	Overall assessment of data	A	
IX.	Field duplicates	2	
x	Field blanks	12W	EB: EB-1 (fm 249949)

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

	<u>Su</u>	. ~	· +		4.00
1	1-0	11	I-M	21	31
2	I-P	12	I-D	22	32
3	I-H	13	I-C	23	33
4	I-U	14	I-S	24	34
5	I-T	15	I-L	25	35
6	I-G	16	I-R	26	36
7	I-Q	17	I-B	27	37
8	I-F	18	I-AR	28	38
9	I-N	19	I-FDUP	29	39
	I-E	20	PB	30	40

Notes:	

LDC #: <u>211075</u>6 SDG #: <u>24990</u>0

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
		pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN- NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1-18	$\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	. \	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
4 19	$\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
3°4		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
2-1		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

omments:

LDC #: 21109116 6 SDG #: 2449 03

# VALIDATION FINDINGS WORKSHEET

Field Blanks

Reviewer: 44

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(>(>)	Sample Identification						
Associated Samples: $\mathcal{A}$ $\mathcal{Q}$ $(> (0 \times )$	Sample Id						
anics, EPA Method Co.  Were field blanks identified in this SDG? Were target analytes detected in the field blanks?  Vere target analytes detected in the field blanks?  Vere target analytes detected in the field blanks?  Soil factor applied Control one Field Blank / Rinsate / Other: C.	Blank ID	ER-1	5 h	8			
METHOD: Inorganics, EPA Method  NA  Were field blanks identified in this SDG?  NNA  Were target analytes detected in the field blanks?  Blank units:	Analyte B		285	1100			

			-		
	uc				
	Sample Identification				
Associated Samples:	San				
Associated					
units: oplied insate / Other					
Associated sample units:_ Soil factor applied_ e one) Field Blank / Rinsate	Blank ID				
Associa					
Blank units: Associated sample units: Sampling date: Soil factor applied Field blank / Rinsate / Other:	Analyte				

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

\$ 100

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 5, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 249949

# Sample Identification

I-AA

M-131

M-64

M-65

M-66

M-79

M-69

M-135

M-99

M-25

M-57A

M-37

EB-1

MD-5

EB-1MS

EB-1MSD

#### Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-37 EB-1	Hexavalent chromium	31.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-1	8/5/08	Perchiorate Total dissolved solids	255 ug/L 18 mg/L	I-AA M-131 M-64 M-65 M-66 M-79 M-69 M-135 M-99 M-25 M-57A M-37

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

## IV. 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.

#### V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples M-65 and MD-5 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Conce	ntration				
Analyte	M-65	MD-5	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	17500 mg/L	18300 mg/L	4 (≤30)	-	-	-
Perchlorate	1410000 ug/L	1400000 ug/L	1 (≤30)	-	-	-

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 249949

SDG	Sample Analyte		Flag	A or P	Reason
249949	M-37 EB-1	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 249949

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 249949

No Sample Data Qualified in this SDG

SDG#	:: 21107E6 #: 249949 atory: MWH Laboratories		LIDATIO		PLETE Stage		ESS WO	RKS	SHEET	:	Date: 🔒 💪 Page: of Reviewer: & ೨ 2nd Reviewer: C
METH Metho	IOD: (Analyte) Hexava d 160.1 SM 2らりっこ)	alent	Chromium	(EPA SW	/846 M	letho	od 7196), I	Perch	nlorate (EPA	Meth	nod 314.0), TDS (EP
	amples listed below were tion findings worksheets.		ewed for ea	ch of the f	followin	ng va	alidation ar	eas.	Validation fi	ndings	s are noted in attache
	Validation	Area							Comment	s	1.00
1.	Technical holding times			≤w	Sampli	ing da	ates: 😽	2	J9		
IIa.	Initial calibration			N			1				
IIb.	Calibration verification			N							
III.	Blanks			Α							
IV	Matrix Spike/Matrix Spike D	uplicat	es	A	1 N	15	MSD				
V	Duplicates			7	] \						
VI.	Laboratory control samples			A	Lus	s	CC33				
VII.	Sample result verification			N		`					
VIII.	Overall assessment of data			A							
IX.	Field duplicates			≲س	٠. رز	- ب	1 + 14			****	
x	Field blanks			5W	EB	-	3				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	lo compound nsate ield blank	ds detect	ted	TB =	Duplica Trip b Equip			
Validate	ed Samples:	<u> </u>	w.L								
1	I-AA	11	M-57A			21			31		
II I	M-131	12	M-37		;	22			32		
	M-64		EB-1		:	23			33		
4	M-65 <sup>&gt;</sup>	14	MD-5			24			34		
II I	M-66	15	EB-1MS			25			35		
6	<b>M</b> -79	16	EB-1MSD		;	26			36		
7	<b>M</b> -69	17	PB		;	27			37		
8	M-135	18			]:	28			38		

10	)	M-25	20	30	40
No	ntes				

M-99

LDC #:21107E6 SDG #:249949

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-11, 14	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C) DH
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
12-13	ري	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC (CR6+)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
c 15-16	رن	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ C124
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	-	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

LDC #: 21107E4 SDG#: 249949

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>of</u>
Reviewer:_	Al
2nd reviewer:	1~

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to each method?

N N/A

Were all cooler temperatures within validation criteria?

WN N/A Were all cool	er temperatures	Within Vandation	Citeriar					il
Method:		7196	·					
Parameters:		C+4+						
Technical holding time:		24 hrs						
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
12	8 5 08	8/6/03		(S) Fran	(31.75h	-1)	J- UJ P	(4)
	0930	1721	-				, ,	
13	85108	8/6/08		(31.754	v()		<u> </u>	1
	0935	1721						

LDC #: 21137 EG SDG #: 24999 METHOD: Inorganics, EPA Method\_

# VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: \ of \ Reviewer: A 2nd Reviewer:

(Y) N N/A Were field b (Y) N N/A Were target Blank units: / L Asset	blanks identifie t analytes dete	Were field blanks identified in this SDG? Were target analytes detected in the field blanks?  Associated sample units:					
Sampling date: 8   8   8   8   8   8   8   8   8   8	e) Field Blank / Rinsate	/ Rinsate / Other こR	Associated Samples: All my to # 13 (313x)	All was	415 (313	\ <b>*</b>	
Analyte	Blank ID			Sample Identification			
	[3						
C101 (11)	222		,				
TOS	1						
Blank units: Ass	Associated sample units:	ole units:					

	ion				
	Sample Identification				
Associated Samples:	Sa				·
Associate					
er:					
Rinsate / Other:					
Field Blank /	Blank ID				
Field blank type: (circle one) Field Blank / Rinsate /	Analyte				

Soil factor applied

Sampling date:

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above; these sample results were qualified as not detected, "U".

LDC#	21	107E6
SDG#:	<u>See</u>	Cover

### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	_of_\	-
Reviewer:_	Al	_
2nd Reviewer:_	In	

Inorganics, Method See Cover

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(c 20)		
Analyte	4	14	(≤ 30) RPD	
TDS	17500	18300	4	
Perchlorate (ug/L)	1410000	1400000	1	

V:\FIELD DUPLICATES\FD\_inorganic\21107E6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 6, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250101

## Sample Identification

I-Z

1-1

I-V

M-67

M-74

M-73

M-88

M-12A

M-11

MD-1

EB-2 EB-2MS

EB-2MSD

#### Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-12A	Hexavalent chromium	33.75 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-11	Hexavalent chromium	33 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
MD-1	Hexavalent chromium	53.5 hours	24 hours	J- (all detects) R (all non-detects)	Р
EB-2	Hexavalent chromium	35.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-2 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	8/6/08	Perchlorate	9.8 ug/L	I-Z I-I I-V M-67 M-74 M-73 M-88 M-12A M-11

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

# IV. 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.

#### V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples M-11 and MD-1 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration			D'''		
Analyte	<b>M-</b> 11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	3260 mg/L	3200 mg/L	2 (≤30)	-	-	•

	Concentration				Difference	
Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Perchlorate	43100 ug/L	43400 ug/L	1 (≤30)	-	-	-

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 250101

SDG	Sample	Analyte	Flag	A or P	Reason	
250101	M-12A M-11 EB-2	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times	
250101	MD-1	Hexavalent chromium	J- (all detects) R (all non-detects)	Р	Technical holding times	

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 250101

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 250101

No Sample Data Qualified in this SDG

SDG a	#:21107F6 #:_250101 atory:_MWH_Laboratorie	•	ALIDATIO		PLETE Stage 2		ORK	SHEET		Date: ¬ / ७ / □ Page: _ of _ Reviewer: _ △ ♪ 2nd Reviewer: _ ✓
METH Metho	HOD: (Analyte) <u>Hexav</u> od 160.1) চি∧ ১১৭১০	/alent	Chromium	(EPA SW	/846 Me	thod 7196	), Perc	chlorate (I	EPA I	Method 314.0), TDS (EPA
The savalida	amples listed below wer tion findings worksheets	e rev	iewed for ea	ach of the f	following	validation	areas.	. Validatio	n find	dings are noted in attached
	Validation	Area			Comments					
I.	Technical holding times		•••	Sω	Samplin	g dates:      8	16	108		
IIa.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			A						
IV	Matrix Spike/Matrix Spike D	Ouplica	tes	A	7 M	5/M5	0			
٧	Duplicates			N		, 				
VI.	Laboratory control samples			A	لدرة	( 6 6 5 5				
VII.	Sample result verification			N		,		W		
VIII.	Overall assessment of data			Α						
IX.	Field duplicates			<u>5w</u>	<i>D =</i>	9+10			***	
<u> </u>	Field blanks	5 W	EB	- 11						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	e	R = Rin	lo compound sate ield blank	is detected	TE	= Duplic 3 = Trip 3 = Equi		<	
'alidate	ed Samples:	<u>~ ~ ·</u>	+			WAS 1				
1	I-Z	11	EB-2		21				31	
2	-	12	EB-2MS		22				32	-
3	I-V ·	13	EB-2MSD		23				33	
4	<b>M</b> -67	14	PB		24				34	
5	M-74	15			25				35	
6	M-73	16			26	_			36	
7	M-88	17			27				37	
8	M12A M - 12A	18			28				38	
9	M11 M-11	19			29				39	
10   I	MD-1	20			30				40	,

Notes:\_\_\_\_

LDC #: 21, 07 PG SDG #: 250101

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_ of \_ Reviewer: \_ A \_ 2nd reviewer: \_ \_ \_

All circled methods are applicable to each sample.

Samula ID	Modelin	Parameter
Sample ID	<u>Matrix</u>	
1-7	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 > 4)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
8-11	<u> </u>	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
12-13	$\sim$	pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+)
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	-	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
,		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLE NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

omments:

LDC #: 21137 F6 SDG #: 250131

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:of
Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.

<u>YN N/A</u>

Were all samples preserved as applicable to each method? N N/A

N N/A Were all cool	ler temperatures \	within validation	criteria?				
Method:		7196					
Parameters:		C-6+					
Technical holding time:		24 hrs					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
8	8 6 28	8 2 08		(33.75)	uri)		J-   UJ   ?
	0844	1828					
9	8 6 0 8	801718		(33 hrs)			1
	0930	1828					
		-1-1-8		(52 -1			J-   R   P
10	8 6 08			(53,5 h	• • )		13   K   I
	0930	1457	-				
11	8/6/08	8/7/08		(35, 5 hrs	\		9 EN - E
	0705	1828					

LDC # 2 11 37 F 4 SDG #: 250101 Were target analytes detected in the field blanks?

METHOD: Inorganics, EPA Method C. C. C. C. Y. N. N. Were field blanks identified in this SDG?

N N/A

# **VALIDATION FINDINGS WORKSHEET** Field Blanks

Page: \ of \ Reviewer: AL 2nd Reviewer:

(×0											
1<) 1# + 4 200 20	ification			-					tification		
Associated Samples: All may # # 11 (>10x)	Sample Identification							Associated Samples:	Sample Identification		
EB							ole units:	r applied / Rinsate / Other:			
ciated samp Soil factor Field Blank	Blank ID	1	8.6				Associated sample units:	Soli Tactor applied Field Blank / Rinsate	Blank ID		
Blank units: Associated sample units: 15 Sampling date: 8/16/08 Soil factor applied Field blank type: (circle one) Field Blank / Rinsate / Other;	Analyfe		Clor					Sampling date: Soli Tactor applied Field blank type: (circle one) Field Blank / Rinsate / Other:	Analyte		

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

7

LDC#	21107F6
SDG#	See Cover

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

	Page:_	7	of_	<u>`</u>
	Reviewer:	A	1	
2nd	Reviewer:		1	

Inorganics, Method See Cover

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	(≤ 30)	
Analyte	9	10	RPD	
TDS	3260	3200	2	
Perchlorate (ug/L)	43100	43400	1	

V:\FIELD DUPLICATES\FD\_inorganic\21107F6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 6, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250123

# Sample Identification

M-92

M-97

M-31A

M-50

M-34

M-35

M-19

M-39

M-68 M-61

I-K

I-J

# Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

Sample EB-2 (from SDG 250101) was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	8/6/09	Perchlorate	9.8 ug/L	All samples in SDG 250123

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

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 250123

No Sample Data Qualified in this SDG

SDG : Labor	#:21107G6 #:_250123 ratory:_MWH_Laboratories HOD: (Analyte)Perchlor camples listed below were ation findings worksheets.	rate (	EPA Met	S hod 314.0),	Stage	2A (EPA	Method 1			Date: ¬   6   5  Page: _ 1 of _ 1  Reviewer: 2  2nd Reviewer: 6  Jings are noted in attached
	Validation	 Area						Comm	ents	
<u> </u>	Technical holding times			i A	Samp	oling d	ates: 🎖	6 08		
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks			Δ						
IV	Matrix Spike/Matrix Spike Du	uplicate	es	N	1	<u> 21</u>	C1:~!	+ Somit	لم :	
V	Duplicates			l N		2		<b>)</b>		
VI.	Laboratory control samples			A	LC	2	LUSD			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A	<u> </u>					Marie and the second se
IX.	Field duplicates			N						
Lx	Field blanks		National Control of the Control of t	5 ಒ	<u>LE</u>	<u>B =</u>	EB-2	(for 21)	201.	01)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:		R = F	F No compound Rinsate Field blank	is detec	cted	TB =	Duplicate = Trip blank = Equipment blan	k	
T T	<u> </u>		<u>, _                                   </u>		T					
	M-92	11	I-K			21			31	

1 2 3 4 5	M-92	11	I-K	21	31	
2	M-97	12	I-J	22	32	
3	M-31A	13	PB	23	33	
4	M-50	14		24	34	
5	M-34 ·	15		25	35	
6	M-35	16		26	36	
7	M-19	17		27	37	
8	M-39 ·	18		28	38	
9	M-68 ·	19		29	39	
10	M-61	20		30	40	

Notes:	

LDC #: 2110766 SDG #: 250123

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: <u>_\</u>	_of
Reviewer:_	Al
2nd reviewer:	

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-12	$\omega$	PH TOS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ C134
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR6+
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		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		ph tds cif NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
·		PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 21103 64

SDG #: 250 123

# VALIDATION FINDINGS WORKSHEET Field Blanks

Page: 1 of 1 Reviewer: 4 & 2 2nd Reviewer: 1

METHOD: Inorganics, EPA N	<b>Method</b> ∑	Nethod ∑ C			
YN N/A Were field bla	anks identified	d in this SDG?			
N/A Were target analytes detected in the field blan	analytes dete	Were target analytes detected in the field blanks?			
Blank units: A 1c Asso	ciated samp	le units: 🚣 / ८			
Sampling date: 8/6/08	Soil factor	r applied 🌅			
Field blank type: (circle one) Field Blank / Rinsate / Othe): E.B.	Field Blank	/ Rinsate /(Othe): こる	Associated Samples:	All (>10x	( × c
Analyte	Blank ID		Samp	Sample Identification	

ation							ation				
Sample Identification							Sample Identification				
8						of constant	9				
						.;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;					
						14					
Value of the state						ple units:or applied					
Blank ID	EB.2	8.6				ociated sam	Blank ID				
Analyte		C104				Ass Ass	Analyte				
Ana		13 				Blank units: Associated sample units: Sampling date: Soil factor applied	Ana				

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 7, 2008

**LDC Report Date:** 

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250139

# Sample Identification

M-87

M-70

M-71

M-72

M-38

M-22A

M-89

M-17A

M-115

IVI- I I I J

M-14A

M-36

M-84

M-10

MD-2

M-100

M-17ADUP

M-84MS

M-84MSD

# Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MD-2	Total dissolved solids	43 days	7 days	J- (all detects) R (all non-detects)	P
M-36	Hexavalent chromium	30.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-84 MD-2	Hexavalent chromium	31 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-10	Hexavalent chromium	29.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-100	Hexavalent chromium	31.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р

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

# II. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples M-84 and MD-2 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration					
Analyte	M-84	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P	
Hexavalent chromium	0.065 mg/L	0.070 mg/L	7 (≤30)	•	-	-	
Total dissolved solids	1210 mg/L	958 mg/L	23 (≤30)	-	-	_	
Perchlorate	9360 ug/L	9260 ug/L	0 (≤30)	-	-	-	

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 250139

SDG	Sample	Analyte	Flag	A or P	Reason
250139	MD-2	Total dissolved solids	J- (all detects) R (all non-detects)	Р	Technical holding times
250139	M-36 M-84 M-10 MD-2 M-100	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 250139

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 250139

No Sample Data Qualified in this SDG

SDG :	#:21107H6 #:_250139 atory: MWH Laboratories		LIDATIOI		PLET Stage		ESS WO	RKSHEET		Date: 🤼 💪 Page: ַ ַ of ַ ַ Reviewer: _ △ △ 2nd Reviewer: _ △
	HOD: (Analyte) Hexava	alent	Chromium	(EPA SW	/846 N	/lethc	od 7196), F	Perchlorate (E	PA I	Method 314.0), TDS (EPA
	amples listed below were tion findings worksheets.		wed for ea	ch of the fo	ollowi	ng va	alidation ar	eas. Validatio	n find	dings are noted in attached
	Validation	Area						Comm	ents	
1.	Technical holding times			ათ	Samp	oling d	ates: 👸	17/08		
lla.	Initial calibration			N						
Ilb.	Calibration verification			N			-,			
111.	Blanks				<u> </u>			****		
IV	Matrix Spike/Matrix Spike D	uplicat	es		17	M 5	IMED	1Dap		
V	Duplicates			A_				•		
VI.	Laboratory control samples			A	LC	5	LC30			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			SW	0	- ()	2 + 1 4			
$ L_{x} $	Field blanks								*******	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<b>;</b>	R = Rin	lo compound isate ield blank	ls detec	cted	TB =	Duplicate Trip blank Equipment blanl	k	
Validat	ed Samples:	<u> </u>	· L							
1	M-87	11	M-36			21	**************************************		31	
2	M-70		M-84	***************************************		22			32	
3	M-71	13	M-10			23		,	33	
4	M-72	14	MD-2 ,			24			34	
5	M-38	15	M-100			25			35	
6	M-22A	16	M-17ADUP			26			36	
7	M-89	1	M-84MS	P		27			37	

9	M-115	19	PB	29	39	
10	M-14A	20		30	40	
Nlata						
Note	es:	<del>, ,</del>				<del></del>

M-17A

18

M-84MSD

LDC #: 2110746 SDG #: 250139

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

	0		Powerton
ŀ	Sample ID	<u>Matrix</u>	Parameter
╟	1-10	$\omega_{-}$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C134)
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	11-15	W	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+) (C104)
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
دا	16	W	PH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
٠ <b> </b>	17-18	$\mathcal{S}$	PH TDS CIF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+)
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ľ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
.			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			
╟			pH TDS CLF NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
┢			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
┢	-		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
Ĺ			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:		

LDC #: 2110746 SDG#: 250139

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: <u> </u>	
Reviewer: 🔥	
2nd reviewer:	-

All circled dates have exceeded the technical holding time.

(N) N N/A

Were all samples preserved as applicable to each method?

(N) N/A

Were all cooler temperatures within validation criteria?

er temperatures v	vithin validation	criteria?				
	140.1 5M	2540C	7196			
	T D 2		Cr 6+			
me:	7 days		24 hrs			
Sampling	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
8/7/08	9 19 38		(43 days	\		J-1817
			1-1-	(2	-1	J-/NJ/?
				(30	, i hrs	12. (N2 (1
0823			1107			
8/7/08			8 8 08	(311	-1)	
0805			f241			
5 2 1 6			= 18128	(29	51.	1
					S Net )	
80/4/8			86 8 8	(312	()	1
9802			142>			
801-108			8   8   38	(31.2	5 Lm)	l l
			1457			
	me: Sampling date  \$   7   08  0823  8   7   08  0805  8   7   08  0805  8   7   08  0805		Sampling date date date    Sampling date   Analysis date		$                                    $	$  \begin{array}{c c c c c c c c c c c c c c c c c c c $

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SDG#:	<u>See</u>	Cover	

# **VALIDATION FINDINGS WORKSHEET**

**Field Duplicates** 

	Page:_	1	_of_	7
	Reviewer:		AI	
2nd	Reviewer:		10	

Inorganics, Method See Cover

YN NA YN NA Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

	Concentra	tion (mg/L)	(c 30)	
Analyte	12	14	(≤ 30) RPD	
Hexavalent Chromium	0.065	0.070	7	
TDS	1210	958	23	
Perchlorate (ug/L)	9360	9260	1	

V:\FIELD DUPLICATES\FD\_inorganic\21107H6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 11, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250388

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

PC-99R2/R3DUP

# Introduction

This data review covers 18 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

# III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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 with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS3 (PC-120)	Perchlorate	129.0 (75-125)	-	-	J+ (all detects)	P

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 250388

SDG	Sample	Analyte	Flag	A or P	Reason
250388	PC-120	Perchlorate	J+ (all detects)	Р	Laboratory control samples (%R)

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 250388

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 250388

No Sample Data Qualified in this SDG

SDG i Labor	#:21107l6 #:_250388 atory:_MWH Laboratories HOD: (Analyte)Perchlo	3		S	tage 2A	S WORKS		Date: ユーレータ Page: _ of _ Reviewer: _ ムノ 2nd Reviewer: _ ↓
The s valida	amples listed below were tion findings worksheets.	revie	wed for ea	ch of the fo	ollowing valid	ation areas. \	Validation findi	ngs are noted in attached
	Validation	Area					Comments	
I.	Technical holding times			A	Sampling dates	s: 8 111	128	
lla.	Initial calibration			N				
IIb.	Calibration verification			N		·····		
111.	Blanks			A_				
IV	Matrix Spike/Matrix Spike Di	uplicat	es	N	& Dup			
V	Duplicates			Α_	) `			
VI.	Laboratory control samples			SW	LCS LC	20		
VII.	Sample result verification			N				
VIII.	Overall assessment of data		<b>4</b>	Δ				
IX.	Field duplicates			N			····	
Lx	Field blanks							
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<b>;</b>	R = Rin	lo compound isate ield blank	s detected	D = Duplica TB = Trip bl EB = Equip	lank	
Validat	ted Samples:	a fu						
1	ART-1	11	PC-117		21		31	
2	ART-2	12	PC-118		22		32	
3	ART-3	13	PC-119		23		33	
4	ART-4	14	PC-120		24		34	

1	ART-1	11	PC-117	21	31
2	ART-2	12	PC-118	22	32
3	ART-3	13	PC-119	23	33
4	ART-4	14	PC-120	24	34
5	ART-7	15	PC-121	25	35
6	ART-8	16	PC-133	26	36
7	PC-99R2/R3	17	ART-9	27	37
8	PC-115R	18	PC-99R2/R3DUP	28	38
9	PC-116R	19	PB	29	39

30

40

Notes:	 	 	

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SF-1

LDC #: 21107 T 6
SDG #: 250388

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of \_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

	Sample ID Mat	trix	Parameter
	1-17 6	,	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1)
		<u></u>	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
درا	18 0	ر	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			ph tds ci f No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> Alk Cn Nh <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			ph TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

omments:	

LDC# 21101IC SDG #: 250388

# VALIDATION FINDINGS WORKSHEET **Laboratory Control Samples (LCS)**

Page: \ of \ Reviewer: A 2nd Reviewer:\_

METHOD: Inorganics, Method\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Was a laboratory control sample (LCS) analyzed for each matrix in this SDG? (YON N/A

Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY: Y W N/A

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. Y N KWA

#	I CS/I CSD ID	Matrix	Analyte	LCS %R (limits)	LCSD- %B (limits)-	RPD (limits)	Associated Samples	Qualifications
	LCS 3	3	C10,	(24.0 (75-125)	(		1	J. 1-412
			•					
Con	Comments:							

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 13, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 250906

Sample Identification

H-28A

### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

# V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 250906

No Sample Data Qualified in this SDG

SDG#	:: 21107J6 #: 250906 atory: MWH Laboratories	Date: ع ا د ارد Page: _ ر of _ ر Reviewer: <u>حا</u> 2nd Reviewer:						
	IOD: (Analyte) Perchlore	<del></del>						
Γhe sa ∕alidat	amples listed below were tion findings worksheets.	review	wed for eac	ch of the fo	ollowing	g va	lidation areas. Validation	n findings are noted in attached
	Validation A	<u>Area</u>					Comme	ents
I.	Technical holding times			Α	Samplir	ng de	ates: 8 13 \ 08	
lla.	Initial calibration			N				
IIb.	Calibration verification			N				
111.	Blanks			A_	<del></del>			
IV	Matrix Spike/Matrix Spike Du	ıplicate	<u>s</u>	A	1 t	· ~ ~	251027	
<u></u>	Duplicates			7	11			
VI.	Laboratory control samples			A	LCS	5	LC 2 D	
VII.	Sample result verification			N	<del> </del>			
VIII.	Overall assessment of data	<del></del>		A_				
IX.	Field duplicates		!	N_				
_x_	Field blanks			<u> </u>				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	lo compound: nsate ield blank	is detecte	ed	D = Duplicate TB = Trip blank EB = Equipment.blank	(
Validate	ed Samples:	ا سر	· · T					
1	H-28A	11			2	21		31
2	PB	12			- 2	22		32
3		13			2	23		33
4		14				24		34
5		15			;	25		35
6		16			<u> </u>	26		36

9	19	29	39	
10	20	30	40	
Notes:				

LDC #: 210756 SDG #: 250906

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	<u>\</u> of <u>\</u>	
Reviewer:	Al	
2nd reviewer:		/

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
\	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ C1 34
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
·		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:		 	

### Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 11 through August 14, 2008

LDC Report Date:

July 28, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 4

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 251027

### Sample Identification

PC-55 MW-K4 PC-58 MW-K5 PC-56 PC-53 PC-60 PC-103 PC-59 PC-98R PC-62 M-87 PC-68 L-635 PC-97 L-637 PC-86 PC-55MS PC-90 PC-55MSD PC-91 PC-55DUP PC-17 PC-18DUP PC-18

ARP-1

PC-134

PC-135

PC-122

ARP-6B

ARP-5A

ARP-4A

### Introduction

This data review covers 32 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### 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. Calibration

### a. Initial Calibration

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

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

### III. Blanks

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

No field blanks were identified in this SDG.

### IV. 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.

### V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PC-55DUP (PC-55)	Total dissolved solids	13.7 (≤10)	-	J (all detects) UJ (all non-detects)	А

### VI. 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 with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS (PC-55)	Total dissolved solids	77.4 (80-114)	-	•	J- (all detects) UJ (all non-detects)	Р

### VII. Sample Result Verification

All sample result verifications were acceptable.

### VIII. Overall Assessment of Data

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

### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 251027

SDG	Sample	Sample Analyte		A or P	Reason
251027	PC-55	Total dissolved solids	J (all detects) UJ (all non-detects)	А	Duplicate sample analysis (RPD)
251027	PC-55	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Laboratory control samples (%R)

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 251027

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 251027

No Sample Data Qualified in this SDG

SDG	#:21107K6 #: 251027 ratory:_MWH Laboratorie		ALIDATIO			ΓEN ge 4	ESS WORI	KSHEET		Date: 1/26 Page: 1 of 1/26 Reviewer: 2nd Reviewer: 1/26	
MET	HOD: (Analyte) Perchlo	orate	(EPA Metho	d 314.0), <sup>-</sup>	TDS	(EPA	Method 160.	1/SM2540C)	)		
	samples listed below were ation findings worksheets		iewed for ea	ch of the fo	ollow	ing v	alidation area	s. Validation	fin	dings are noted in attached	
	Validation	Area	3					Comme	nts		
ı.	Technical holding times			A	Sam	pling	dates: 8/11				
lla.	Initial calibration			A							
Ilb.	Calibration verification			A							
111.	Blanks			A							
IV	Matrix Spike/Matrix Spike D	A	- hy/mgy/ymp								
V	Duplicates			SW	17	1	<del> </del>				
VI.	Laboratory control samples			SW	Les/Lesp						
VII.	Sample result verification			Δ							
VIII.				A							
IX.	Field duplicates	<u> </u>		N							
x	Field blanks			N							
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet	)	R = Rin	o compounds sate eld blank	s dete	cted	D = Dup TB = Tri EB = Eq				
	PC 55	144	DO 04			<u> </u>	D. 50.0 L. C. 4			DO SERVID	
1 2	PC-55 PC-58	11	PC-91			21	MW-K4	3.		PC-55DUP	
1 1		12	PC-17			22	MW-K5	32		PC-18DUP	
3 4	PC-56	13	PC-18			23	PC-53	33		עוין	
	PC-60	14	ARP-1			24	PC-103	34			
5 6	PC-59	15	PC-134			25	PC-98R	35			
7	PC-62 PC-68	16 17	PC-135 PC-122			26 27	M-87 L-635	36			

[10   PC-90	20   ARP-4A	30 PC-55MSD	40
Notes:			
1101003.			
***************************************			

28

29

L-637

PC-55MS

18

19

ARP-6B

ARP-5A

38

39

PC-97

PC-86

### **VALIDATION FINDINGS CHECKLIST**

Page: 1 of 1
Reviewer: 1
2nd Reviewer: 1

Validation Area	Yes	No	NA	Findings/Comments
Catedonical holding times		) iii	16	
All technical holding times were met.	1	1	<u> </u>	
Cooler temperature criteria was met.	U	<u>{</u>	L,	
	攤	켎		
Were all instruments calibrated daily, each set-up time?	<u> </u>	ļ	_	
Were the proper number of standards used?	/	ļ	ļ	
Were all initial calibration correlation coefficients > 0.9957	1			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)	/			
<b>斯姆斯</b> 朗斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	\$			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	1			
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq$ 20% for waters and $\leq$ 35% for soil samples? A control limit of $\leq$ CRDL( $\leq$ 2X CRDL for soil) was used for samples that were $\leq$ 5X the CRDL, including when only one of the duplicate sample values were $\leq$ 5X the CRDL.		1	S <u></u>	
Was an LCS anaytzed for this SDG?	<b>Y</b>			
Was an LCS analyzed per extraction batch?	7			
Were the LCS percent recoveries (%R) and relative percent difference (RPO) within the 80-120% (85-115% for Method 300.0) QC limits?	W			
o al charles have a compensate a first that				
Were performance evaluation (PE) samples performed?			1	
18/cm the nedermance symbolics (DE) camples within the acceptance limits?				

LDC #: >1107/6 SDG #: 15/627

### VALIDATION FINDINGS CHECKLIST

Page: Yof Y Reviewer: MM 2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
Mr. Sample Basili, Verille Sical			L.	
Wore RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	1 .			
Were detection limits < RL?				
<b>的一种,他们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们们</b>				
Overall assessment of data was found to be acceptable.	/			
Field duplicate pairs were identified in this SDG.			-	
Target analytes were detected in the field duplicates.				
Field blanks were identified in this SDG.	l			,
Target analytes were detected in the field blanks.			$\triangle$	

EDC #: 107 K/s

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	t of 1
Reviewer:	Mn
2nd reviewer:	V
_	

All circled methods are applicable to each sample.

Sample ID	Parameter
1-28	PH (TDS)CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+ CLOC
	PH TOS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
N 79.30	PH TOS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
31.32	PH (TDS )CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH THE CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CIF NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR"+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+
	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CRO+
	PH TOS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CRO+
	ph tos ci f no, no, so, po, alk cn nh, tkn toc cr*
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	ph tds ci f no, no, so, po, alk cn nh, tkn toc cr
	PH TDS CI F NO, NO, SO, PO, ALK CN' NH, TKN TOC CR"+
	ph tos ci f no, no, so, po, alk cn nh, tkn toc crot

Comments:	

LDC #:

METHOD: Inorganics, Method

## VALIDATION FINDINGS WORKSHEET

Page:

2nd Reviewer: Reviewer:

**Duplicate Analysis** 

Please see qualifications below for all questions enswered "N", Not applicable questions are identified as "N/A", Was a duplicate sample analyzed for each matrix in this SDG?

V N NA

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)↑ If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample les tant values were ≾5X the CRDL, if field blanks were used for laboratory duplicates, see overall assessment. EVEL IV ONLY: W/N N/A

Qualifications A Associated Samples Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. 1410 RPD (Limits) Analyte 78 Watrk Duplicate ID Comments;

LDC #: 1107Kb X on SDG #:

METHOD: Inorganics, Method\_

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Reviewer: M

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

YANNA Were all LCS percent recoverles (%R) within the control limits of 80-120% (85-115% for Method 300.0)?

LVI NA Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

OnelHostone														as 155 spiked of 700	
Associated Samples												÷		ed of 175 orm	
%R (limits)	174 (8-114)													Sp. a Les   50-1/20 ]	
Analyte	Sal				,									applicable	
Matrix	*													4.80 Sect a	
# #	75,													Comments:	

SDG#: 211 01/6 SDG#: 75 027

# Validatin Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: of / Reviewer: to 2nd Reviewer: &

Method: Inorganics, Method

for comme

The correlation coefficient (r) for the calibration of  $\frac{20 \, \text{M}}{100 \, \text{M}}$  was recalculated.Calibration date:  $\frac{8 \, |\gamma \gamma| \, |\gamma g|}{100 \, \text{M}}$ 

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Acceptable N Z (00) Reported 0.999985 r or r (02.) 800) Recalculated (.2.) 0.999957 r or r 0.025 0.104 0.002 0.004 0.052 Area 0.01 Conc. (ug/L) なな なり 100 20 9 2 X Co Standard  $\lambda$ **s**2 83 **\$**4 **S**2 98 s, 3 E Analyte CI04 8008/2 4/, 1, 8 Calibration verification Calibration verification Calibration Verification Initial calibration Type of analysis

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. 3

100 #: -1107 (LL SDG #:

### VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

2nd Reviewer: Reviewer: Page:

METHOD: Inorganics, Method

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

Where, %R = Found x 100 True

Found \*

True m

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result). concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = <u>1S-D1</u> × 100 Where, (S+D)/2

Original sample concentration Duplicate sample concentration

# # % Q

	•				Receiculated	Reported	
Sample 10	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
	Laboratory control sample						
752		1	787	561	(د ۴	<del>),</del> ¢.)	<del>&gt;-</del>
	Matrix spike sample		(SSR-8R)				
7		Low	954	No	177	36	
	Duplicate sample			1			$\rightarrow$
3		> a	pto	7400	13.7	13.7	·

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_	110	746
SDG #:	-5	200

### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:	
Reviewer:	Ми
2nd reviewer:	
_	/

		/
	Inorganics, Method See Court	
Please see N N/A N N/A N N/A	Are results within the calibrated range of the instruments?	
Compound	d (analyte) results for	t were
Concentration	n = Recalculation:	
中!	$cloy = \frac{Aven \times 0.7}{0.00103.78} cloy = \frac{0.048 \times 20}{0.5010378} = 925^{\circ}$	1/1

	Sample ID	Analyt•	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	Sample to	ceox (vg/s	927	915	4
		To 3 ("3/)	7400	1400	1
2		ear with	1500	1200	<b>-</b>
	'	Tory (my/u)	7730	1730	<u> </u>
<u> </u>		lest (mg/)	88600	88600	Y
-3	2	This lands	7300	1350	
			1		
					·
_					
-					
-					
				l ·	

Note:	_
	_

### Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

August 18, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 251181

Sample Identification

ART-6

### Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### 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. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

### IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

### VI. 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 with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS1 (All samples in SDG 251181)	Total dissolved solids	125.7 (80-114)	-	-	J+ (all detects)	P

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 251181

SDG	Sample	Analyte	Flag	A or P	Reason
251181	ART-6	Total dissolved solids	J+ (all detects)	P	Laboratory control samples (%R)

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 251181

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 251181

No Sample Data Qualified in this SDG

### VALIDATION COMPLETENESS WORKSHEET LDC #: 21107L6

Stage 2A

Date: 7 Ulog
Page: <u>\</u> of <u>\</u>
Reviewer: <u>A</u>
2nd Reviewer:

SDG #: 251181 Laboratory: MWH Laboratories

METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) SM 2540 C

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
	Technical holding times	Δ	Sampling dates: ৪ [ । ১ ] ৩ ৪
lla.	Initial calibration	N	
llb.	Calibration verification	N _	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	4 Clict specifics
٧	Duplicates	7	
VI.	Laboratory control samples	SW	LCS LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	Δ_	
IX.	Field duplicates	2	
_x_	Field blanks	<u> </u>	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

vandatod Gampioo.	Au wol			
1 ART-6	11	21	31	
2 PB	12	22	32	
3	13	23	33	
4	14	24	34	
5	15	25	35	
6	16	26	36	
7	17	27	37	
7	18	28	38	
8	19	29	39	
10	20	30	40	

Notes:	

LDC #: 2110726 SDG #: 251181

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_\_ Reviewer: \_\_\_\_\_\_ 2nd reviewer: \_\_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
\	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ C134
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO. NO. SO, PO, ALK CN NH. TKN TOC CR6+

Comments:	

LDC #: 21107 10 SDG # 251181

## VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

2nd Reviewer.\_\_ Reviewer:\_

METHOD: Inorganics, Method\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were all LCS percent recoveries (%R) within the control limits of 8<del>0 120% (85-115% for Method 300.0)?</del> Was a laboratory control sample (LCS) analyzed for each matrix in this SDG? Y'N N'A

LEVEL IV ONLY: Y (N) N/A

-Y: Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. X N AND

ä	400	U SO I	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	TIPLI	1 2 1	(*)	100	125.7	ACI	7/4/2
			3				
						100 miles	
						アンイン・ アンクル・トー	
Com	Comments:						

### Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2008 Annual Remedial Performance Sampling

**Collection Date:** 

September 8, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 253362

### Sample Identification

ART-1

ART-2

ART-3

ART-4

...

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

PC-116RDUP

### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ART-7	Total dissolved solids	11 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

### II. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

### IV. Matrix Spike/Matrix Spike Duplicates

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

### V. Duplicates

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

### VI. 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.

### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 253362

SDG	Sample	Analyte	Flag	A or P	Reason
253362	ART-7	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 253362

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 253362

No Sample Data Qualified in this SDG

SDG#	:21107M6 #:_253362 atory:_MWH_Laboratories		ALIDATIO		PLETE Stage		SS WOR	(SHEET	7	Page: of Reviewer: V
METH	IOD: (Analyte) Perchlor	<u>ate (</u>	(EPA Metho	od 314.0), 7	TDS (E	EPA M	lethod 160.	1/5~2	3400	<u>-</u>
	amples listed below were tion findings worksheets.	revi	ewed for ea	ch of the fo	ollowin	g valio	dation area	s. Validati	on find	lings are noted in attached
	Validation A	Area						Comr	nents	
1.	Technical holding times			200	Sampli	ing date	es: 9   ·	80 / 8		
lla.	Initial calibration			N	ļ <u>.</u>					
IIb.	Calibration verification			N						
111.	Blanks			A	<u> </u>					
IV	Matrix Spike/Matrix Spike Du	ıplica <sup>(</sup>	tes	N	3 -	کس				
V	Duplicates			A						
VI.	Laboratory control samples			A_	LL	.5 \ 1	LC50			
VII.	Sample result verification			N						
VIII.	Overall assessment of data			LA						
IX.	Field duplicates			N	<u> </u>					
Lx_	Field blanks			<u></u>	<u> </u>					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rir	lo compounds nsate ield blank	s detect	:ed	D = Dup TB = Tri EB = Ec		nk	
Validate	ed Samples:	<b>и</b> _								
1 ,	ART-1	11	SF-1			21			31	
	ART-2	12	PC-117			22			32	
	ART-3	13	PC-118			23			33	
	ART-4	14	PC-119		:	24			34	
	ART-6	15	PC-120			25			35	
	ART-7	16	PC-121			26			36	

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Notes:

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PC-133

ART-9

PB

PC-116RDUP

ART-8

PC-99R2/R3

PC-115R

10 PC-116R

LDC#:<u>21107116</u> SDG#:<u>253362</u>

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of \_\_ Reviewer: \_\_A\_ 2nd reviewer: \_\_

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
		$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C1 > 4
	1-18	$\sim$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
را	19	(N)	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		$-\infty$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		· · · · · · · · · · · · · · · · · · ·	ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
.			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	·, · · · · · · · · · · · · · · · · · ·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: 21117M6 SDG #: 253362

### VALIDATION FINDINGS WORKSHEET <u>Technical Holding Times</u>

Page:_	<u>\</u> of <u>\</u>
Reviewer:_	A
2nd reviewer:	10/

All circled dates have exceeded the technical holding time.

(Y) N N/A Were all samples preserved as applicable to each method?

YN N/A Were all cooler temperatures within validation criteria? Method: 160.1 Parameters: ZGT Technical holding time: **Analysis Analysis Analysis Analysis** Sampling **Analysis** Sample ID date date date date date date Qualifier (11 d~15) J-145 P (h)

### Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

2008 Annual Remedial Performance Sampling

**Collection Date:** 

September 8 through September 11, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 253834

### Sample Identification

M-87 ARP-5A
PC-98R ARP-6B
PC-86 PC-53
PC-90 PC-103
PC-56 MWK-5
PC-58

PC-59

PC-60

PC-62

PC-68

PC-91

PC-97

PC-17

PC-18

PC-55

L-635

L-637

MWK-4

ARP-1

ARP-4A

#### Introduction

This data review covers 25 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P	
ARP-1	Total dissolved solids	13 days	7 days	J- (all detects) UJ (all non-detects)	Р	

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

## V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# **VIII. Overall Assessment of Data**

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 253834

SDG	Sample	Analyte	Flag	A or P	Reason
253834	ARP-1	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 253834

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 253834

No Sample Data Qualified in this SDG

#### VALIDATION COMPLETENESS WORKSHEET LDC #: 21107N6 SDG #: 253834

Stage 2A

Date: <u> </u> -	8	ျ
Page: \_\_c	f	· 
Reviewer: _A_	1	
2nd Reviewer:	_	_

Laboratory: MWH Laboratories

METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) エハ マデリュ C

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	5ట	Sampling dates: 9 8 - 9 IV 08
IIa.	Initial calibration	N	
llb.	Calibration verification	N	
111.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	? Clint Spailed
V	Duplicates	ļ γ	
VI.	Laboratory control samples	A	LLS LLSD
VII.	Sample result verification	N	`
VIII.	Overall assessment of data	<u>A</u>	
IX.	Field duplicates	2	
x	Field blanks	2	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

vallue	ated Samples.	<u>~~ ~~</u>					
1	M-87	11	PC-91	21	ARP-5A	31	
2	PC-98R	12	PC-97	22	ARP-6B	32	
3	PC-86	13	PC-17	23	PC-83 PC-53	33	
4	PC-90	14	PC-18	24	PC-103	34	
5	PC-56	15	PC-55	25	MWK-5	35	
6	PC-58	16	L-635	26	PB	36	
7	PC-59	17	L-637	27		37	
8	PC-60	18	MWK-4	28		38	
9	PC-62	19	ARP-1	29		39	
10	PC-68	20	ARP-4A	30		40	

Notes:	

LDC #: 21107206 SDG #: 253 834

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-25	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 > 4)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

LDC #: 2110706 SDG #: 2-73 834

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: \_of_\
Reviewer: 🔥
2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y) N N/A Were all samples preserved as applicable to each method?

(N) N N/A Were all cooler temperatures within validation criteria?

Method:			2540C				
Parameters:		T D 2					
Technical holding time:		7 deys					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
19	9 9 08	9 22 08		(13 day	2		J- (UJ P (1
					:		
					118	1	
					() (),		
						-	
			•				

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

October 13, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 256589

# Sample Identification

ART-1

**ART-1DUP** 

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

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PC-120

PC-121

PC-133 ART-9

ART-1MS

ART-1MSD

#### Introduction

This data review covers 21 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	6.0 mg/L	ART-4

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

No field blanks were identified in this SDG.

#### IV. 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.

#### V. Duplicates

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

# VI. 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 with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS1 (ART-1 ART-2 ART-3 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9)	Total dissolved solids	125.7 (80-114)	-	-	J+ (all detects)	P

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 256589

SDG	Sample	Analyte	Flag	A or P	Reason
256589	ART-1 ART-2 ART-3 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R SF-1 PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9	Total dissolved solids	J+ (all detects)	Р	Laboratory control samples (%R)

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 256589

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 256589

No Sample Data Qualified in this SDG

SDG # Labora	#:21107O6 #:_256589 ratory:_MWH Laboratories HOD: (Analyte)Perchlor	<u> </u>	LIDATION	S	Sta	ige 2A		,		Date: 3   5   5   5   5   5   5   5   5   5
	amples listed below were ation findings worksheets.		wed for each	ch of the fo	ollc	owing va	alidation a	areas. Valid	ation findi	ngs are noted in attached
	Validation	<u>Area</u>			<u>L</u>			Cor	mments	
I.	Technical holding times			Α	Sŧ	ampling da	ates:	0   13   0	2 8	
Ila.	Initial calibration			N						
llb.	Calibration verification			N						
111.	Blanks			500	Ĺ					
IV	Matrix Spike/Matrix Spike Du	uplicat	es	A	$\coprod$	MS	IMS	DIDa	·C	
V	Duplicates			A	厂	<u> </u>	· 	-		
VI.	Laboratory control samples	<u> </u>		Sω	Ļ	LC3	LCID	<u>,                                      </u>		
VII.	Sample result verification			N	$oldsymbol{\perp}$					
VIII.	Overall assessment of data			A	$oldsymbol{\perp}$					
IX.	Field duplicates			7	$oldsymbol{\perp}$					
_ <u>x_</u>	Field blanks		****	N	L		******			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rins	lo compounds isate ield blank	s de	etected	TB	Duplicate Trip blank Equipment	blank	
Validat	ted Samples: △ℳ	٠								
1	ART-1		SF-1			21	ART-1DUF	<b></b>	31	
	ART-2		PC-117			22	PB		32	
	ART-3		PC-118			23	<u> </u>		33	
	ART-4		PC-119			24			34	
		-								

		Δ.α ~	· · · ·				
1	ART-1	11	SF-1	21	ART-1DUP	31	
2	ART-2	12	PC-117	22	PB	32	
3	ART-3	13	PC-118	23		33	
4	ART-4	14	PC-119	24		34	
5	ART-6	15	PC-120	25		35	
6	ART-7	16	PC-121	26		36	
7	ART-8	17	PC-133	27		37	
8	PC-99R2/R3	18	ART-9	28		38	
9	PC-115R	19	ART-1MS	29		39	
10	PC-116R	20	ART-1MSD	30		40	

Notes:		

LDC #: <u>211070</u>6 SDG #: <u>257658</u>9

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of \_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
81-1	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C) > 1
	$\sim$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
c 19-20	$\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C10 <sub>4</sub>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
21	W	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	-	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

VALIDATION FINDINGS WORKSHEET Blanks

Page: 1 of 1 Reviewer: A 2nd Reviewer:\_

METHOD: Inorganics, Method \_

LDC #: 2113706 SDG #: 25 4 581

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were all samples associated with a given method blank?

N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

(>60-)	Sample identification												
7	Sam												
oles:													
Associated Samples:_													
Asso													
	Rlank	Action Limit			र्वे								
	1	ICB/CCB											
<u>ل</u> ا ا	CI design	Diamik ID	15	0									
Conc unife:		Anaiyte		100	,								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U".

10C # 5112 # 201 SDG # 256 589

# VALIDATION FINDINGS WORKSHEET **Laboratory Control Samples (LCS)**

2nd Reviewer: Reviewer: Page: \ of \

**METHOD**: Inorganics, Method\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits? Was a laboratory control sample (LCS) analyzed for each matrix in this SDG? LEVEL IV ONLY: ON N/A

.Y: Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	I CS/I CSD ID	Matrix	Analyfe	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications
	(5)	3	TDS	125.7			1-3,5-18	J. d. + 10
				:				
		:		-				
								100000000000000000000000000000000000000
					And the second s			
Com	Comments:							

LCSD.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

October 14 through October 15, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 257010

# Sample Identification

M-87
PC-98R
PC-86
PC-90
PC-56
PC-58
PC-59
PC-60
PC-62
PC-68

PC-17 PC-18 PC-55 L-635 L-637 PC-86MS PC-86MSD

PC-60DUP

MW-K4 ARP-1 ARP-4A

ARP-4A ARP-5A

ARP-6B PC-53 PC-103 MW-K5

PC-91 PC-97

#### Introduction

This data review covers 28 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PC-98R PC-86 PC-90 PC-56 PC-58 PC-60 PC-62 PC-68 ARP-1 PC-91 PC-97 PC-17 PC-17 PC-18 PC-55 L-635 L-637	Total dissolved solids	8 days	7 days	J- (all detects) UJ (all non-detects)	Р
PC-59	Total dissolved solids	11 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. 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.

#### V. Duplicates

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

# VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

## IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 257010

SDG	Sample	Analyte	Flag	A or P	Reason
257010	PC-98R PC-86 PC-90 PC-56 PC-58 PC-59 PC-60 PC-62 PC-68 ARP-1 PC-91 PC-97 PC-17 PC-18 PC-55 L-635 L-637	Total dissolved solids	J- (all detects) UJ (all non-detects)	P	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 257010

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 257010

No Sample Data Qualified in this SDG

# LDC #: 21107P6 VALIDATION COMPLETENESS WORKSHEET SDG #: 257010 Stage 2A

Date: 👍 👂 👂 o

Page: \_ \_ of \_ \_ \

Reviewer: \_ \_ \_ \

2nd Reviewer: \_ \_ \

Laboratory: MWH Laboratories

METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) ないという

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	5 W	Sampling dates: 10 114 - 10 15 08
lla.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	(MS/MED/Dap
V	Duplicates	A	
VI.	Laboratory control samples	A	LUS LUSD
VII.	Sample result verification	N_	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	12	
x.	Field blanks	1 77	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

· anda	ted dampies.	AU	wet				<del></del>
1	M-87	11	MVV-K4	21	PC-17 ·	31	
2	PC-98R	12	ARP-1 ·	22	PC-18 .	32	
3	PC-86 ·	13	ARP-4A	23	PC-55 ·	33	
4	PC-90 -	14	ARP-5A	24	L-635	34	
5	PC-56 '	15	ARP-6B	25	L-637	35	
6	PC-58 '	16	PC-53	26	PC-86MS	36	
7	PC-59 · ·	17	PC103 PC-103	27	PC-86MSD	37	
8	PC-60 '	18	MW-K5	28	PC-60DUP	38	
9	PC-62 ·	19	PC-91 ·	29	PB	39	
10	PC-68 ·	20	PC-97 -	30		40	

Notes:	

LDC #: 21107PC SDG #: 257010

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_\_ Reviewer: \_\_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
		pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1-25	$-\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
0		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> Clo <sub>4</sub>
26-27	_ <del>U</del>	
2 6		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
28	لی	pH TOS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>5</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f no <sub>3</sub> no <sub>2</sub> so <sub>4</sub> po <sub>4</sub> alk cn <sup>-</sup> nh <sub>3</sub> tkn toc cr <sup>6+</sup>
		ph tds ci f No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f no <sub>3</sub> no <sub>2</sub> so <sub>4</sub> po <sub>4</sub> alk cn <sup>-</sup> nh <sub>3</sub> tkn toc cr <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+

Comments:

LDC #: 2110776 SDG #: 287010

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page: <u> </u>	\
Reviewer:	<u> </u>
2nd reviewer:	

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to each method? (Ŷ) N N/A

N N/A Were all cook	er temperatures	within validation	criteria?				1
Method:		160.1 51	125402				
Parameters:		TDS					
Technical holding ti	me:	7 days					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
2-6 8-10,	10/14/08	10 22 08		(8 days)			7-/43/P
12, 19-25							
7	12/14/28	10/25/08		(11 days)			
							-
		÷					
						i u e e entre la esta esta esta esta esta esta esta est	4
		:				11171 761 4	-
	•						
			W-W-W-W-				

# Laboratory Data Consultants, Inc. **Data Validation Report**

2008 Annual Remedial Performance Sampling Project/Site Name:

November 3, 2008 **Collection Date:** 

LDC Report Date: July 14, 2009

Water Matrix:

Parameters: Wet Chemistry

Validation Level: Stage 2A

Laboratory: MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258290

# Sample Identification

I-AR I-NMSD

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-ARDUP** 

I-NMS

#### Introduction

This data review covers 21 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB-1 (from SDG 258305) was identified as a field blank. No contaminant concentrations were found in this blank.

# IV. 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.

#### V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 258290

No Sample Data Qualified in this SDG

SDG a Labor	t:21107Q6 #: _258290 atory: <u>MWH Laboratories</u> H <b>OD: (Analyte)</b> Perchlo	<u> </u>		S	tage 2	Α	SS WORKSHEET	ło <i>c</i>	Date: ع ا الاح Page: _ of _ Reviewer: _ حا 2nd Reviewer: _ ا
	amples listed below were tion findings worksheets.		ewed for ea	ch of the fo	ollowing	va	lidation areas. Validatio	n find	lings are noted in attached
	Validation	Area					Comm	ents	
l .	Technical holding times			A	Sampling	g da	ites: 11 3 08		
lla.	Initial calibration			N		·			
IIb.	Calibration verification			N					
111.				Α					
IV					12~	\	IMED I Dup		
V	Duplicates			Α			,		
VI.				Δ	463		LCID		
VII.	Sample result verification			N					
VIII.	Overall assessment of data			Α					
IX.	Field duplicates			N					
X	Field blanks			110	FB.	-	FB-1 (from 2	583	305)
Note: A = Acceptable ND = No compounds detected D = Duplicate N = Not provided/applicable R = Rinsate TB = Trip blank SW = See worksheet FB = Field blank EB = Equipment blank							k		
Valida	ted Samples:		· <b>L</b>						
1	I-AR	11	I-E		21		I-NMSD	31	
2	I-O	12	I-M		22		78	32	
	-0    -P	13	I-D		23	$\neg$		33	
3	I-H	14	I-C	24			34		
5	I-U	15	I-S		25			35	
110	1-0	<u> </u>	<u> </u>			_		1	

			<del>~</del>				
1	I-AR	11	I-E	21	I-NMSD	31	
2	I-O	12	I-M	22	78	32	
3	I-P	13	I-D	23		33	
4	I-H	14	I-C	24		34	
5	I-U	15	I-S	25		35	
6	I-T	16	I-L	26		36	
7	I-G	17	I-R	27		37	
8	I-Q	18	I-B	28		38	
9	I-F	19	I-ARDUP	29		39	
	I-N	20	I-NMS	30		40	

Notes:	

LDC #: 21107 Q6 SDG #: 258290

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

All circled methods are applicable to each sample.

0	Na deliv	Parameter
Sample ID	Matrix	
1-18	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 > 4)
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
19	W	pH (DS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
20-21	ω	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup> CO
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	· · · · · · · · · · · · · · · · · · ·	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<u>L</u>		DH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 3, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258305

# Sample Identification

PC-123

PC-124

PC-125

PC-126

PC-127

PC-128

PC-131

PC-132

FB-1

M-96

PC-54

I-AA

M-66

M-65

M-64

MD-3

M-95

PC-125DUP

M-95MS

M-95MSD

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample Analyte		Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P	
M-95	Hexavalent chromium	31.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р	

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample FB-1 was identified as a field blank. No contaminant concentrations were found in this blank.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples PC-128 and MD-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration				
Analyte	PC-128	MD-3	RPD (Limits)	Difference (Limits)	Flag	A or P
Total dissolved solids	5620 mg/L	5400 mg/L	4 (≤30)	-	-	-
Perchlorate	187000 ug/L	231000 ug/L	21 (≤30)	-	-	-

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258305

SDG	Sample	Analyte	Flag	A or P	Reason
258305	M-95	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258305

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 258305

No Sample Data Qualified in this SDG

## LDC #: 21107R6 VALIDATION COMPLETENESS WORKSHEET SDG #: 258305 Stage 2A Laboratory: MWH Laboratories

Date: → 8 0°
Page:of
Reviewer: A
2nd Reviewer:

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) ストントロート

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Technical holding times	ے سا	Sampling dates: \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
lla.	Initial calibration	N	
llb.	Calibration verification	N	
111.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	Α	& MS (MSD I DWP
V	Duplicates	Δ	
VI.	Laboratory control samples	Α	LC3 (CSN
VII.	Sample result verification	N	, and the second
VIII.	Overall assessment of data	Α	
IX.	Field duplicates	ತಬ	D= 6+16
х	Field blanks	20	FB: 9

Note:

A = Acceptable

SW = See worksheet

N = Not provided/applicable

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

TB = Trip blank EB = Equipment blank

Validated Samples:

vallue	ated Samples.	AU	w.+			
1	PC-123	11	PC-54	21 P	8'	31
2	PC-124	12	I-AA	22		32
3	PC-125	13	M-66	23		33
4	PC-126	14	M-65	24		34
5	PC-127	15	M-64	25		35
6	PC-128 <sup>5</sup>	16	MD-3 )	26		36
7	PC-131	17	M-95	27		37
8	PC-132	18	PC-125DUP	28		38
9	FB-1	19	M-95MS	29		39
10	M-96	20	M-95MSD	30		40

Notes:	

LDC #: 21107RG SDG #: 25830T

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	<u>\</u> of <u>\</u>
Reviewer:_	Al
2nd reviewer:	

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
**	1-16	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C1 > 1)
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	17	$\omega$	PH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR ) (L 24)
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
<b>≥</b> c	18	w	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
١			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1	19-20	w	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC (CR <sup>6+</sup> )
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
1			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
∦			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
∦			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	 		

LDC #: 21107RG SDG #: 251305

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:of
Reviewer:A
2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y) N N/A

Were all samples preserved as applicable to each method?

N N/A

Were all cooler temperatures within validation criteria?

Method:		7196					
Parameters:	,	Cr6+					
		24 hrs					
Technical holding time:  Sampling Sample ID  date		Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
17		11/4/08		(31.25			J-   UJ   P
	1212	1922		(+ (, = 5	000 2 )		3 / 003 1.
	1212	( 120				,	
							<u> </u>
		:		-		<u> </u>	a terre del reconoción
and the second s							
i samenen sed partes en etitu.	Promotion to the second					tere on a state of the commentation of the	
						<u></u>	
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	<b>1</b>						
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LDC#	21107R6
SDG#:	See Cover

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

	Page:_	<u>\</u> of \
	Reviewer:	21
2nd	Reviewer:	10

Inorganics,	Method	See	Cover	

(YN NA YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(< 30)		
Analyte	6	16	(≤ 30) RPD	
TDS	5620	5400	4	
Perchlorate (ug/L)	187000	231000	21	

V:\FIELD DUPLICATES\FD\_inorganic\21107R6.wpd

#### Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 4, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

EB-1MS

EB-1MSD M-131MS

M-131MSD

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258410

#### Sample Identification

PC-129

PC-130

PC-71

PC-72

PC-73

M-44

PC-37

M-48

MD-4 M-57A

EB-1

M-131

M-79

M-69

M-135

M-25

M-37

M-99

M-44DUP

M-57ADUP

#### Introduction

This data review covers 24 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
EB-1	Hexavalent chromium	80 hours	24 hours	J- (all detects) R (all non-detects)	P
M-37	Hexavalent chromium	75 hours	24 hours	J- (all detects) R (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Sample EB-1 was identified as an equipment blank. No contaminant concentrations were found in this blank.

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples PC-71 and MD-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration		Difference			
Analyte	PC-71	MD-4	MD-4 (Limits)		Flag	A or P
Total dissolved solids	8650 mg/L	7960 mg/L	8 (≤30)	-	-	•
Perchlorate	577000 ug/L	457000 ug/L	19 (≤30)	-	-	-

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258410

SDG	Sample	Analyte	Flag	A or P	Reason
258410	EB-1 M-37	Hexavalent chromium	J- (all detects) R (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258410

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 258410

No Sample Data Qualified in this SDG

SDG#	t: <u>21107S6</u> #: <u>258410</u> atory: <u>MWH Laboratorie</u> :		LIDATIO			Γ <b>ENE</b> e 2A	ESS WORK	SHEET		Date: ¬ \ s \ \s Page: _ \ of \ Reviewer: _ ∆ 2nd Reviewer: _ \
Metho	od 160.1 sm 2540c	)		······································						Method 314.0), TDS (EPA
	amples listed below were tion findings worksheets		ewed for ea	ch of the i	Ollow	ing va	alidation areas	. Valluatioi	l IIIIU	lings are noted in attached
	Validation	Area						Comme	nts	
I.	Technical holding times			5W	Sam	pling d	ates: ١١ -	1 / 08		
lla.	Initial calibration			N	<u> </u>		`	`		
IIb.	Calibration verification			N	ļ					
111.	Blanks			Δ	<u></u>					
IV	Matrix Spike/Matrix Spike D	uplicat	es	Δ	17	٠٨٨	SIMJO	1 Dag		
V	Duplicates			Α			1	1		
VI.	Laboratory control samples			Α	L	- 5	[ LC50			
VII.	Sample result verification			N			!			
VIII.	Overall assessment of data			Δ						
IX.	Field duplicates			JW	1	) : 3	, + 9	<u> </u>		
	Field blanks			70	E	B =	11			
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	Ð	R = Rir	lo compound nsate ield blank	s dete	ected	D = Dupli TB = Trip EB = Equ			
1	PC-129	11	EB-1			21	EB-1MS		31	
	PC-130	12	M-131			22	EB-1MSD		32	
-	PC-71 S	13	M-79			23	M-131MS		33	
11 1	PC-72	14	M-69			24	M-131MSD		34	
	PC-73	15	M-135			25			35	
	M-44	16	M-25			26			36	
	PC-37	17	M-37			27			37	
	M-48	18	M-99			28			38	

Notes:		

29

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19

M-44DUP

M-57ADUP

39

40

MD-4 <sup>9</sup>

M-57A

LDC #: 2110756 SDG #: 258410

### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of\_\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample	ID Matrix	Parameter
1-10	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C1 >4)
12-10	_	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
18		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
11,1	7 W	PH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6)
1		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
c 19-2	ر ا	PH (DS) CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
21-2	$\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC (CR <sup>6*</sup> )
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
23-2	+ W	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	·	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph tds ci f No <sub>3</sub> No <sub>2</sub> So <sub>4</sub> Po <sub>4</sub> Alk cn <sup>-</sup> Nh <sub>3</sub> TKN toc cr <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
·		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN: NH, TKN TOC CR6+

omments:	

LDC #: 2110756 SDG #: 258410

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:\_of\
Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to each method?

Y N N/A Were all coole	er temperatures	within validation	criteria?				<b>-</b>	ı
Method:		7196						
Parameters:		Cr 6+						
Technical holding time:		24 hrs						
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
\		1 , ,		(80 hrs)			J-121P	(L)
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	0 +	.,,,,						
17	11 4 08	11/7/08		(75 hrs)			1	$\mathcal{I}_{i}$
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LDC#	21107S6	
SDG#	See Cover	

#### VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	<u>\_of\</u>
Reviewer:	1
2nd Reviewer:	V)

Inorganics	. Method	See	Cover	

Y	N(	NA_
Y	N	NA
·-	_	

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	(≤ 30)		
Analyte	3	9	RPD	
TDS	8650	7960	8	
Perchlorate (ug/L)	577000	475000	19	

V:\FIELD DUPLICATES\FD\_inorganic\21107S6.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 5, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258563

#### Sample Identification

M-92

MD-1

M-97

M-31A

M-52

M-50

M-34

M-35

M-19

M-39

M-68

M-61

I-K

I-J

I-Z

I-I I-V

M-84

M-10

EB-2

M-11

#### Introduction

This data review covers 21 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-84	Hexavalent chromium	50.5 hours	24 hours	J- (all detects) R (all non-detects)	Р
M-10	Hexavalent chromium	47.25 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
EB-2	Hexavalent chromium	52 hours	24 hours	J- (all detects) R (all non-detects)	Р
M-11 MD-1	Hexavalent chromium	49.75 hours	24 hours	J- (all detects) R (all non-detects)	Р

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

#### II. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	14 mg/L	M-92 M-97 I-K I-J I-Z I-I I-V MD-1

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

Sample EB-2 was identified as an equipment blank. No contaminant concentrations were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-2	11/5/08	Perchlorate Hexavalent chromium	127 ug/L 0.017 mg/L	M-92 M-97 M-31A M-52 M-50 M-34 M-35 M-19 M-39 M-68 M-61 I-K I-J I-Z I-I I-V M-84 M-10 M-11

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:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-92	Perchiorate	884 ug/L	884J+ ug/L
M-84	Hexavalent chromium	0.056 mg/L	0.056J+ mg/L

#### IV. 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.

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples M-11 and MD-1 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration					
Analyte	M-11	MD-1	RPD (Limits)	Difference (Limits)	Flag	A or P
Hexavalent chromium	3,38 mg/L	3.58 mg/L	6 (≤30)	-	-	-
Total dissolved solids	3520 mg/L	3620 mg/L	3 (≤30)	-	-	-
Perchlorate	50400 ug/L	48900 ug/L	3 (≤30)	-	-	-

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258563

SDG	Sample	Analyte	Flag	A or P	Reason
258563	M-10	Hexavalent chromium	J- (all detects) UJ (all non-detects)	P	Technical holding times
258563	M-84 EB-2 M-11 MD-1	Hexavalent chromium	J- (all detects) R (all non-detects)	Р	Technical holding times

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258563

#### No Sample Data Qualified in this SDG

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 258563

SDG	Sample	Analyte	Modified Final Concentration	A or P
258563	M-92	Perchlorate	884J+ ug/L	Α
258563	M-84	Hexavalent chromium	0.056J+ mg/L	Α

SDG#	:: 21107T6 #: 258563 atory: MWH Laboratories		LIDATION		<b>LET</b> tage			WORKSH	EET	Date: ¬ ( p ( )  Page: _ \ of _ \  Reviewer: _ \ \  2nd Reviewer: _ \ \	
<u> Metho</u>	d 160.1 SM 25436	<b>)</b>									
Γhe sa ∕alidal ———	amples listed below were tion findings worksheets.	revie	wed for ead	ch of the ic	Ollowii	ng va	alidatio	on areas. va	ilidation filiui	ngs are noted in attached	
	Validation	<u>Area</u>						C	comments		
l.	Technical holding times			SW	Samp	ling d	ates:	11/5/3	8 <		
lla.	Initial calibration			N							
IIb.	Calibration verification			N							
III.	Blanks			Sω							
IV	Matrix Spike/Matrix Spike Du	upl <u>icat</u>	es	Α	?	t~~	2	58410			
V	Duplicates			A							
VI.	Laboratory control samples			Α	LCS/LCJA						
VII.	Sample result verification			N							
VIII.	Overall assessment of data			Α							
IX.	Field duplicates			SW	12	- 2	· O +	2_\			
_x_	Field blanks			500		ß =					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	!	R = Rins	o compounds sate eld blank	s detec	ted	<b></b>	D = Duplicate TB = Trip blan EB = Equipme	k ent blank		
√alidat∈	ed Samples:	<u>~~</u>	<u> </u>								
1	M-92	11	M-61			21	MD-1	•	31		
	M-97		I-K			22	PB		32		
	M-31A		I-J			23			33		
	M-52		I-Z			24			34		
	M-50		I-I '			25			35		
	M-34		I-V ,			26			36		
	M-35		M-84			27			37		
11 1	M-19		M-10			28			38		
1 1	M-39	19	EB-2			29			39		

Notes:		

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M-11

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M-68

LDC #: <u>211077</u>6 SDG #: <u>258563</u>

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: of Reviewer: A

All circled methods are applicable to each sample.

	7.0.	
Sample ID	Matrix	Parameter Parameter
1-10	W	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
17-21	W	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6)
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS C! F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

LDC #: 2110776 SDG #: 251563

#### **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>\</u> of <u>\</u>
Reviewer:_	Al
2nd reviewer:	10/

All circled dates have exceeded the technical holding time.

N N/A Were all samples preserved as applicable to each method?

N N/A Were all cooler temperatures within validation criteria?

Method:	-	7196					
Parameters:		Crus					
Technical holding t	ime:	24 hrs					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
17	11/5/08	11/7/28		(50.5	hr.)		J-1217
	1128	1404					
18	11/5/08	11/7/21		(48.75	hrs)		J-/41/P
	1318	1404					<u>'</u>
				:			÷
19	11/2/08	11/7/08		(52 h.;		-	J-/R P
	1000	1404			ii.		
MANAGE							
23	11/2/08	80 7 11		(49.75	hus)		<u> </u>
	1215	1424			:		
		1 1		(,,0,5,7	\		1
21	11 2 28	11 7 S		(49.75)	irs \		
	1215	РСЫ					
			***************************************				
water the state of							
						***************************************	
**************************************			***************************************				
						1100 2411 11,11	
			***************************************				

LDC #: 2110756 SDG #: 258563

## VALIDATION FINDINGS WORKSHEET

Page: \ of 2nd Reviewer:\_ Reviewer:\_

METHOD: Inorganics, Method \_\_\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(P) N N/A Were all samples associated with a given method blank?

(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

		- 1																	
														,					
ientification																			
mple Ic																			
Sa																			
		,												-					
Blank	Action Limit																		
Blank ID	PB	71																	
Analyte		105																	
	Blank ID Maximum	Blank ID   Maximum   Blank	Blank ID   Maximum   Blank   ICB/CCB   Action Limit   ICB/CCB   Actio	Blank ID   Maximum   Blank	Blank ID     Maximum     Blank ICB/CCB       P.CS     Action Limit       I.H     ICB/CCB	PB Action Limit PB Action Limit 14	PB Action Limit PB Action Limit ICB/CCB Action Limit	PB Action Limit PB Action Limit ICB/CCB Action Limit	PG Action Limit ICB/CCB Action Limit ILA ILA	PG Action Limit PG Action Limit ICB/CCB Action Limit	PG Action Limit ICB/CCB Action Limit ILA	PG Action Limit PG Action Limit ICB/CCB Action Limit ILM ICB/CCB Action Limit	PG Action Limit ICB/CCB Action Limit ILA	PGS Action Limit PGS Action Limit  14  14  14  15  16  17  17  18  18  18  18  18  18  18  18	PG Action Limit PG Action Limit  14  14  15  15  15  16  16  16  17  17  18  18  18  18  18  18  18  18	PGS Action Limit  PGS Action Limit  14  14  15  16  17  19  17  19  19  19  19  19  19  19	PIS Action Limit PIS Action Limit  14  14  14  15  16  17  17  18  18  18  18  18  18  18  18	Blank ID Maximum Blank   CB/CCB Action Limit   CB/CCB   C	Blank ID Maximum Blank PS Action Limit  I-4  I-4  I-4  I-5  I-5  I-6  I-7  I-7  I-7  I-7  I-7  I-7  I-7

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

LDC #: 211376 SDG #: 258563

# VALIDATION FINDINGS WORKSHEET

Field Blanks

Reviewer: A & 2
-----------------

Page: \\_of\_\\_

( ed. bc) Associated Samples:\_ Sampling date: 11/5/08 Soil factor applied Field blank type: (circle one) Field Blank / Rinsate / Other > CB Were target analytes detected in the field blanks? | Were field blanks identified in this SDG?
| Were target analytes detected in the field blank with the field blank Blank units: | SASSOCIATED SAMPLE | SASSOCIATED SASSOCI **METHOD**: Inorganics, EPA Method\_\_

ıtion						
Sample Identification						
S						
	<del>†</del> 1		47 N C C			
-		+5488				
Blank ID	(ع	(2)	410.0	+		
Analyte		(7/4) 4012	(12)			

Blank units:	Associated sample units:	
Sampling date:	Soil factor applied	
Field blank type: (	Field blank type: (circle one) Field Blank / Rinsate / Other:	Associated Samples:

		 _	 	 
u				
Sample Identification				
Sam				
Blank ID				
Analyte	izaninanizarian kalinandakina zanan danara			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#	21107T6	
SDG#:	See Cover	

#### **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u></u> c	)f
Reviewer:	A	1
d Reviewer	1	

Inorganics, Method See Cover

ŶN NA ŶN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	/< 30 <b>)</b>		
Analyte	20	21	(≤ 30) RPD	
Hexavalent Chromium	3.38	3.58	6	
TDS	3520	3620	3	
Perchlorate (ug/L)	50400	489001	3	,

V:\FIELD DUPLICATES\FD\_inorganic\21107T6.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 6, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258623

#### Sample Identification

M-67

M-133

M-74

M-73

M-88

M-87

M-70

M-71

M-72

M-38

M-36

M-12A

M-100

100

M-22A

M-89

M-17A

MD-2

M-100MS

M-100MSD

MD-2DUP

#### Introduction

This data review covers 20 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
M-36	Hexavalent chromium	29.5 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-12A MD-2	Hexavalent chromium	30 hours	24 hours	J- (all detects) UJ (all non-detects)	Р
M-100	Hexavalent chromium	29.75 hours	24 hours	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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. 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.

#### V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

Samples M-12A and MD-2 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concer	ntration				
Analyte	M-12A	MD-2	RPD (Limits)	Difference (Limits)	Flag	A or P
Hexavalent chromium	13.7 mg/L	14.7 mg/L	7 (≤30)	-	-	-
Total dissolved solids	8100 mg/L	7950 mg/L	2 (≤30)	-	-	-
Perchlorate	289000 ug/L	288000 ug/L	0 (≤30)	-	-	-

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258623

SDG	Sample	Analyte	Flag	A or P	Reason
258623	M-36 M-12A M-100 MD-2	Hexavalent chromium	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258623

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 258623

No Sample Data Qualified in this SDG

SDG Labo	#: <u>21107U6</u> #: <u>258623</u> ratory: <u>MWH Laboratorie</u>	S		S	Stag	je 2A	•	ORKSHEE <sup>-</sup>		Date: $\frac{18}{100}$ Page: $\frac{1}{100}$ of $\frac{1}{100}$ Reviewer: $\frac{2}{100}$ 2nd Reviewer: $\frac{1}{100}$
MET Meth	HOD: (Analyte) <u>Hexav</u> od 160.1) ร ณ	alent	Chromium	(EPA SW	846	Meth	od 7196	), Perchlorate	(EPA	Method 314.0), TDS (EPA
The s valida	samples listed below wer ation findings worksheets	e rev	iewed for ea	ch of the f	ollov	wing v	alidation	areas. Validat	ion fin	dings are noted in attached
	Validation	Area	1					Comi	nents	
I.	Technical holding times			5ω	Sar	npling c	dates: \	166		
lla.	Initial calibration			N						
IIb.	Calibration verification			N						
111.	Blanks	·		_						
IV	Matrix Spike/Matrix Spike Duplicates			<u> </u>	3 M3 /M50 10 mp					
V	Duplicates									
VI.	Laboratory control samples			A	L	دع	16055	>		
VII.	Sample result verification		···	N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			200	D-12+17					
X	Field blanks			N						
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:	÷	R = Rin	o compounds sate eld blank	s det	ected	TE	= Duplicate 3 = Trip blank 3 = Equipment bla	nk	
	AL	<u>۸ ،</u> T	<del>//</del>			1				
1	M-67		M-36			21	िष्ठ		31	
2	M-133	12 .	M-12A			22			32	
3	M-74 -	13 ·	M-100		<u> </u>	23			33	
4	M-73 •	14	M-22A			24			34	
5	M-88 ·	15	M-89			25			35	
6	M-87	16	M-17A			26			36	
7	<b>M-</b> 70	17 .	MD-2			27			37	
8	M-71	18	M-100MS			28			38	

29

30

39 40

19

20

M-100MSD

MD-2DUP

M-72

M-38

Notes:\_

LDC #: 2110746 SDG #: 258623

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_\_ 2nd reviewer: \_\_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parame
1-11 (5-10	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ (C) S4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
12-14,17	W	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+) (CLOS)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
18-19	$\omega$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
20	LW	pH (TDS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN: NH, TKN TOC CR6+

Comments:	

LDC #: 2110746 SDG#: 258623

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_	<u>\</u> of <u>\</u>
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2nd reviewer:	/

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to each method?

N N/A

Were all cooler temperatures within validation criteria?

ier temperatures	within validation	criteria?		T			7
	7196						
Parameters: Technical holding time:							
Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
11/6/08	11/7/28		(29.5	(29.5	hrs	J. 105 12	(4)
' '	V						
11/6/08	11/7/08		(30 hr	)		ļ Ļ	ţ
	\						
11/6/38	11/7/28		(29.75	(urs)		L	1
1		:					
				y Á	-		
11/6/28	3617111		(30 hrs	)		L	l
' '	' '						
	•						
		and write a strong of the					
	ime:   Sampling date	7196   Cx c+   Cx c+   24 lw x   25 look   2	Cr   Cr   Cr   Cr   Cr   Cr   Cr   Cr	ime: $24 \text{ hr}$ ime: $24 \text{ hr}$ Analysis date date date date $\frac{30.5}{(29.5)}$ $\frac{11}{1}$ $\frac{1}{1}$ $$	TIP 6  Cr $^{\circ}$ +  ime:  Sampling Analysis date date date  Analysis date date $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	THE COLUMN COLU	T196   Cr   Cr   Cr   Cr   Cr   Cr   Cr   C

LDC#	21107U6
SDG#:	See Cover

# **VALIDATION FINDINGS WORKSHEET**

Field Duplicates

Page:_	<u>of</u> _
Reviewer:_	Al
2nd Reviewer:	\/\/

Inorganics, Method See Cover

(Y)N NA YNNA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentra	4.00		
Analyte	12	17	(≤ 30) RPD	
Hexavalent Chromium	13.7	14.7	7	
TDS	8100	7950	2	
Perchlorate (ug/L)	289000	288000	0	

V:\FIELD DUPLICATES\FD\_inorganic\21107U6.wpd

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 7, 2008

**LDC Report Date:** 

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258639

Sample Identification

M-76

M-75

M-115

M-14A

### Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

2008 Annual Remedial Performance Sampling
Wet Chemistry - Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 258639

No Sample Data Qualified in this SDG

SDG	5#:21107V6 5#:_258639 oratory:_MWH_Laborator	_	ALIDATIC			TEN je 2/		ORKSH	EET	Date: 3 / 8 / Page: \ of \ Reviewer: \ \ 2nd Reviewer: \
MET	FHOD: (Analyte) Perch	lorate	(EPA Meth	od 314.0),	TDS	(EP	A Method	160.1 s	M 2540	c)
The valid	samples listed below we lation findings workshee	ere rev ts.	iewed for ea	ach of the f	follov	ving v	alidation a	areas. Val	idation find	ings are noted in attached
	Validatio	n Area						C	omments	
<u> </u>	Technical holding times				Sam	npling (	dates: ( )	171	08	
lla	. Initial calibration			N				1		
IIb	. Calibration verification			N						
111.	Blanks			A						
IV	Matrix Spike/Matrix Spike Duplicates			7	7	CI	:~ + S	oni f:	<u>.</u>	
V	Duplicates			1				1		
VI.	Laboratory control sample	s		A		cs 1	L ( 5 )			
VII	Sample result verification			N						
VIII	. Overall assessment of dat	a		A						
IX.	Field duplicates	11		N						
Lx	Field blanks			N						
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le	R = Rin	o compounds sate eld blank	s dete	ected	TB :	Duplicate = Trip blank = Equipmen	t blank	
	ted Samples:	1.	<u> </u>							
1	M-76	11				21			31	
2	M-75	12				22			32	
3	M-115	13				23			33	
4	M-14A	14				24			34	
5	PB	15				25			35	
6		16				26			36	
7		17				27			37	
8		18				28			38	

Notes:\_

LDC #: 21107 V6
SDG #: 258639

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_of\_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

Sample ID	Matrix	
		Parameter
1-4	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C134)
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO NO SO PO ALK CN: NH TKN TOC CR6+
		PH TDS CLE NO. NO. SO. BO. ALK CN. NH. TKN TOC CR6+
	_اا_	pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 10, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 258779

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

**ART-3DUP** 

### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 258779

No Sample Data Qualified in this SDG

SDG	#: <u>21107W6</u> #: <u>258779</u> pratory: <u>MWH Laboratorie</u>	_	ALIDATIO		<b>PLET</b> Stage		ESS WORKSHEE	ĒΤ	Date: ¬ ( s   o Page: <u>  of   l</u> Reviewer: <u>  A / l</u> 2nd Reviewer: <u>                                    </u>
MET	HOD: (Analyte) Perchlo	<u>orate</u>	(EPA Metho	d 314.0),	TDS (	EPA	Method 160.1 ≥ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤ ≤	2240	د)
The valid	samples listed below wer ation findings worksheets	e rev	iewed for ea	ch of the f	followir	ng v	alidation areas. Valida	ation find	 dings are noted in attached
	Validation	Area	3				Con	nments	
1.	Technical holding times			A	Sampl	ling d		> 8	
lla	Initial calibration			N					
Ilb	Calibration verification			N					
111.	Blanks			Δ					
IV	Matrix Spike/Matrix Spike D	uplica	tes	7	}	<i>D -</i>	√S		
	Duplicates			_A_	\		1		
VI.	Laboratory control samples			Δ	Lc	3	4017		
VII	Sample result verification			N		ſ			
VIII	. Overall assessment of data		w	A				***	
IX.	Field duplicates			~~					
LX.	Field blanks			7					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	e	R = Rins	o compound sate eld blank	is detect	ted	D = Duplicate TB = Trip blank EB = Equipment b	lank	
Valida	ted Samples:	<u>,                                     </u>	nt_						
1	ART-1	11	SF-1			21		31	
2	ART-2	12	PC-117			22		32	
3	ART-3	13	PC-118		2	23		33	
4	ART-4	14	PC-119		2	24		34	
5	ART-6	15	PC-120		2	25		35	
6	ART-7	16	PC-121		2	26		36	
7	ART-8	17	PC-133		2	27		37	
8	PC-99R2/R3	18	ART-9		2	28		38	
9	PC-115R	19	ART-3DUP		2	29		39	
10	PC-116R	20	PB		3	30		40	

Notes:\_

LDC #: 2110706

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: of Reviewer: A

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
(-18	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C) = 1
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
c 19	W	pH (DS)CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR8+
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		PH TDS CIF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		PH TDS CIF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
:		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
		ph TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	 	
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# Laboratory Data Consultants, Inc. **Data Validation Report**

**Project/Site Name:** 

2008 Annual Remedial Performance Sampling

**Collection Date:** 

November 10 through November 13, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 259063

# Sample Identification

M-87 PC-97 PC-98R PC-18 PC-86 PC-55 PC-90 L-635 PC-56 L-637 PC-58 PC-58DUP

PC-59

PC-60

PC-62

PC-68

PC-122

MW-K4

ARP-1

ARP-4A

ARP-5A

ARP-6B

PC-53

PC-103

MW-K5

PC-91

### Introduction

This data review covers 26 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# I. Technical Holding Times

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

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PC-58	Total dissolved solids	9 days	7 days	J- (all detects) UJ (all non-detects)	Р

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

### II. Calibration

### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	14 mg/L	MW-K4 ARP-1 ARP-4A ARP-5A ARP-6B PC-53 PC-103 MW-K5 PC-55 L-635

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

No field blanks were identified in this SDG.

# IV. Matrix Spike/Matrix Spike Duplicates

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

# V. Duplicates

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

# VI. 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.

# VII. Sample Result Verification

Raw data were not reviewed for this SDG.

### VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 259063

SDG	Sample	Analyte	Flag	A or P	Reason
259063	PC-58	Total dissolved solids	J- (all detects) UJ (all non-detects)	Р	Technical holding times

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 259063

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling Wet Chemistry - Field Blank Data Qualification Summary - SDG 259063

No Sample Data Qualified in this SDG

LDC #:_	21107X6	
SDG #	259063	

# VALIDATION COMPLETENESS WORKSHEET

Stage 2A

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Lab	00	atory	: MWH	Laboratories

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METHOD: (Analyte) Perchlorate (EPA Method 314.0), TDS (EPA Method 160.1) Sれより

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	SW	Sampling dates: 11 10 - 11 12 08
lla.	Initial calibration	N	11(12100
IIb.	Calibration verification	N	
111.	Blanks	5W	
IV	Matrix Spike/Matrix Spike Duplicates	2	Dup
V	Duplicates	A	124/
VI.	Laboratory control samples	A	LC3 / LC5 D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	Δ	
IX.	Field duplicates	7	
_X	Field blanks	7	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

	acted Samples.	Du	und				
1_	M-87	11	PC-122	21	PC-97	31	
2	PC-98R	12	MW-K4	22	PC-18	32	
3	PC-86	13	ARP-1		PC-55 ·	33	
4	PC-90	14	ARP-4A	24	L-635	34	
5	PC-56	15	ARP-5A	25	L-637	35	
6	PC-58 *	16	ARP-6B	26	PC-58DUP	36	
7	PC-59	17	PC-53 ·	27	PB	37	
8	PC-60	18	PC-103 ·	28		38	
9	PC-62	19	MW-K5	29		39	
10	PC-68	20	PC-91	30		40	

Notes:	

LDC #: 21107x6 SDG #: 259063

# VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_\_of_	<u></u>
Reviewer: A	
2nd reviewer:	

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
	1-25	$\omega$	pH (DS) CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ (C1 )
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ЭC	26	$\mathcal{L}$	pH (TDS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		•	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
			ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
-			ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
-			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
-	·		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
F			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
ŀ			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
F			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
F			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
┢			PH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
╟			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
┢			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:

LDC #: 21137x6 SDG #: 259 0 63

# **VALIDATION FINDINGS WORKSHEET Technical Holding Times**

Page:_\_of_\_
Reviewer: A
2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y) N N/A Were all samples preserved as applicable to each method?

(N) N N/A Were all cooler temperatures within validation criteria?

Method:		140.1 54	n25402				
Parameters:		TOS					
Technical holding ti	me:	7 days					
Sample ID	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
6	11/10/08	11 08		(9 days)			J-/w1P
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<del>an mark to was to the control of th</del>						a di sense di periodi	
							No. A garage
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LDC#: 2113+16 SDG#: 254065

# VALIDATION FINDINGS WORKSHEET

Reviewer: A /

Blanks

METHOD: Inorganics, Method \_\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

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										_		
(×)												
1 < ) +	uo											
23-24 (>10x)	Sample Identification											
2-19	Sam											
Associated Samples:												
Asso			,									
	Blank	Action Limit										
	Maximum											
امر الاساد الاساد	Blank ID	PB	エー									
Conc. units:	Analyte		105									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

December 8 through December 9, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 261012

# Sample Identification

ART-1

ART-2

ART-3

ART-4

ART-6

ART-7

ART-8

PC-99R2/R3

PC-115R

PC-116R

SF-1

PC-117

PC-118

PC-119

PC-120

PC-121

PC-133

ART-9

**ART-1DUP** 

### Introduction

This data review covers 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

# 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. Calibration

# a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

# b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

### III. Blanks

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

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	36 mg/L	ART-1 ART-2 ART-3 ART-4 ART-6 ART-7 ART-8 PC-99R2/R3 PC-115R PC-116R PC-117 PC-118 PC-119 PC-120 PC-121 PC-133 ART-9

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

#### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 261012

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 261012

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 261012

No Sample Data Qualified in this SDG

	#:_21107Y6 #:_261012	. VA	ALIDATIO		<b>PLETI</b> Stage		ss wo	RKSH	EET	Date: <u>→ [ৡ ]</u> Page: <u> </u>
	ratory: <u>MWH Laboratorie</u>	s		,	Jiago	<i>41</i> \		,		Reviewer:
										2nd Reviewer:
MET	HOD: (Analyte) Perchlo	<u>orate</u>	(EPA Metho	od 314.0),	TDS (F	<u>EPA N</u>	Method 16	<u>50.1) 5</u>	M2540	c)
								1		
The s	samples listed below were	e revi	iewed for ea	ch of the f	followin	ıg vali	dation are	eas. Va	lidation find	lings are noted in attache
valida	ation findings worksheets	١.								
	Validation	Area	1		T			C	omments	
1.	Technical holding times		<u> </u>	A	Sampli	ing date	es: 12	181	0 8 <b>-</b>	12 9 1 38
lla.	Initial calibration			N	- Carrie	ng date	<del>23.  </del>	1 0 1	<u> </u>	12   100
IIb.	Calibration verification			N						
111.	Blanks			zω						
IV	Matrix Spike/Matrix Spike D	 Ouplica	tes	7	7 7	دبه د				
V	Duplicates	,		A						
VI.	Laboratory control samples	,		A	4	s 1 c	.csD			
VII.	Sample result verification			N		= , =				***************************************
VIII.		·		A		·····				
IX.	Field duplicates			12						
X	Field blanks			7				·	M	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	ə	R = Rins	o compound sate eld blank	is detect	ed	TB =	uplicate Trip blank Equipme		
Valida	ted Samples:	<u> </u>	A							
1	ART-1	11	SF-1		2	21			31	
2	ART-2	12	PC-117		2	22			32	The state of the s
3	ART-3	13	PC-118		2	23			33	
4	ART-4	14	PC-119		2	24			34	
5	ART-6	15	PC-120		2	25			35	
6	ART-7	16	PC-121		2	26			36	
7	ART-8	17	PC-133		2	27			37	
8	PC-99R2/R3	18	ART-9		2	28			38	
9	PC-115R	19	ART-1DUP		2	9			39	
10	DC 116D	20	PR		1				40	

LDC #: 2 1107 Y 6
SDG #: 261012

## VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: \_\_\_of \_\_ Reviewer: \_\_\_\_ 2nd reviewer: \_\_\_\_

All circled methods are applicable to each sample.

	Sample ID	Matrix	Parameter
***	1-18	$\omega$	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> (C) Sy
		$\sim$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
2د	19	ري	pH T(DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	, ,		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
1			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-	-,-		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
ŀ			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CLF NO3 NO2 SO4 PO4 ALK CN°NH3 TKN TOC CR6+
-			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
l			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
L			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
-			pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+
-			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
$\parallel$			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
F			pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
L			pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	,

LDC #: 2113716 SDG #: 241012

# VALIDATION FINDINGS WORKSHEET

Page: \ of \ Reviewer: 2nd Reviewer:

METHOD: Inorganics, Method \_\_\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were all samples associated with a given method blank?

N N/A Were all samples associated with a given method blank?

N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

1												
( > 1 o x )	uo											
12-18	Sample Identification											
1-10-12	San											
								•				
Associated Samples:												
Assc									,			
	Blank	Action Limit										
	Maximum											
7 ( ;	Blank ID	PR	e M									
Conc. units:	Analyte		TDS									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the methoc blank concentration were qualified as not detected, "U".

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

2008 Annual Remedial Performance Sampling

**Collection Date:** 

December 8 through December 11, 2008

LDC Report Date:

July 10, 2009

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

Stage 2A

Laboratory:

MWH Laboratories, Inc.

Sample Delivery Group (SDG): 261275

#### Sample Identification

M-87 PC-91
PC-98R PC-97
PC-86 PC-17
PC-90 PC-18
PC-56 PC-55
PC-58 L-635
PC-59 L-637

PC-60

PC-62

PC-68

PC-122

MW-K4

ARP-1

ARP-4A

ARP-5A

ARP-6B

ARP-7

PC-53

PC-103

MW-K5

#### Introduction

This data review covers 27 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 and Standard Method 2540C for Total Dissolved Solids and EPA Method 314.0 for Perchlorate.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) and the EPA Region 9 Superfund Data Evaluation/Validation Guidance, NDEP guidance (May 2006) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

#### 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. Calibration

#### a. Initial Calibration

Initial calibration data were not reviewed for Stage 2A.

#### b. Calibration Verification

Calibration verification data were not reviewed for Stage 2A.

#### III. Blanks

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

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Total dissolved solids	6 mg/L	ARP-1 PC-18 PC-55

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

No field blanks were identified in this SDG.

#### IV. Matrix Spike/Matrix Spike Duplicates

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

#### V. Duplicates

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

#### VI. 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.

#### VII. Sample Result Verification

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

### 2008 Annual Remedial Performance Sampling Wet Chemistry - Data Qualification Summary - SDG 261275

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 261275

No Sample Data Qualified in this SDG

2008 Annual Remedial Performance Sampling
Wet Chemistry - Field Blank Data Qualification Summary - SDG 261275

No Sample Data Qualified in this SDG

1.0									
SDG	#: <u>21107Z6</u> #: <u>261275</u> ratory: <u>MWH Laboratorie</u>	•	LIDATIO		PLET Stage		ESS WOR	KSHEET	Date: → \ s \ Page: _ \ of _ Reviewer: _ & \ 2nd Reviewer: _ \ \
	HOD: (Analyte) Perchlo								- -  ngs are noted in attache
	ition findings worksheets	<b>3</b> .		I	T				
	Validation	Area			<u> </u>			Comments	
I.	Technical holding times			A	Samp	ling d	lates: 12 \ 3	3-12/11/	28
lla.	Initial calibration			N	<u> </u>				
IIb.	Calibration verification			N					
111.	Blanks			3W	1				
IV	Matrix Spike/Matrix Spike D	Duplicat	es	<del>/ //</del>	++	<u> </u>	: ~ t 5p		
	Duplicates			2	+ 1 -				
VI.	Laboratory control samples	3	,		16	- S	1 C 7 2		
VII.	Sample result verification			N					
VIII.	Overall assessment of data			<del></del>	<del> </del> -		·		
IX.	Field duplicates			<u> </u>	-				
X Note: /alidat	A = Acceptable N = Not provided/applicabl SW = See worksheet ed Samples:	e Au	R = Rin	o compound sate eld blank	ls detec	ted	D = Dup TB = Tr EB = Ed		
1	M-87	11	PC-122			21	PC-91	31	
2	PC-98R	12	MW-K4			22	PC-97	32	
3	PC-86	13	ARP-1 ·			23	PC-17	33	
4	PC-90	14	ARP-4A			24	PC-18 ·	34	
5	PC-56	15	ARP-5A			25	PC-55 ·	35	
6	PC-58	16	ARP-6B			26	L-635	36	
7	PC-59	17	ARP-7			27	L-637	37	
8	PC-60	18	PC-53			28	PB	38	

L	10	PC-68	20	MW-K5	30	40	
-				•		 	
V	lotes	S:				 	

29

39

PC-103

19

PC-62

LDC #: 2110726 SDG #: 261275

#### VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

	Page:_	7	_of <u>\</u> _	- :: -
	Reviewer:	_	Al	
2r	nd reviewer:			_

All circled methods are applicable to each sample.

Commis ID	Matrix	Parameter
Sample ID	Watrix	pH (DS) CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup> C1 S-4
1 2 7	$\sim$	pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
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		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
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		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
		pH TDS CI F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+

Comments:	

LDC #: ユリッスもと SDG #: 2 61225

# VALIDATION FINDINGS WORKSHEET Blanks

Page. of Reviewer: 2nd Reviewer:

METHOD: Inorganics, Method \_\_\_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a given method blank?

(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units:   L	: ~ ) L. Blank ID	Maximum	Blank	Assc	Associated Samples:	3, 24.25 Sample Ide	ntificati	> ( 0 k)		
Analyte	Dialin ID	ICB/CCB	Action Limit							
1	4									
1125	او		·							
				-						
				٠						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U".