

March 6, 2018

January 02, 2018

Mr. Scot Fitzgerald  
CH2MHill Plateau Remediation Company  
MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352

Re: CHPRC SAF W18-012  
Work Order: 440273  
SDG: GEL440273

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 19, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,



Heather Shaffer  
Project Manager

Purchase Order: 300071 - 7H  
Chain of Custody: W18-012-085 and W18-012-086  
Enclosures



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# Case Narrative

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF W18-012  
SDG: GEL440273

January 02, 2018

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt**

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on December 19, 2017, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Items of Note** All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative.

**Sample Identification**

The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
440273001	B3FK25
440273002	B3FK21
440273003	B3FK26
440273004	B3FK22

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: General Chemistry and Metals.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.



Heather Shaffer  
Project Manager

**Technical Case Narrative  
 CH2MHill Plateau Remediation Company (CPRC)  
 SDG #: GEL440273  
 Work Order #: 440273**

**Metals**

**Determination of Metals by ICP**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

**Calibration Information**

**Instrument Calibration**

The samples in this SDG did not contain potassium at concentrations higher than the RDL, therefore the data was not adversely affected. The samples in this SDG contained potassium at concentrations less than the MDL, therefore the data was not adversely affected. 440273001 (B3FK25), 440273002 (B3FK21), 440273003 (B3FK26) and 440273004 (B3FK22).

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were negative values in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203941621 (MB)	Arsenic	See applicable report

**General Chemistry**

**Alkalinity**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

<b>SAMPLE ISSUE RESOLUTION (SIR) REPORT</b>	<b>SIR Number:</b> SIR18-0522 <b>Rev. Number:</b> 0 <b>Date Initiated:</b> 03/06/2018
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<b><u>SAMPLE EVENT INFORMATION</u></b>	
<b>SAF NUM(S):</b>	W18-012
<b>LABORATORY:</b>	GEL

<b><u>SAMPLING INFORMATION</u></b>	
<b>NUMBER OF SAMPLES:</b>	2
<b>SAMPLE NUMBERS:</b>	B3FK22, B3FK26
<b>SAMPLE MATRIX:</b>	WATER
<b>SDG NUM(S):</b>	GEL440273

<b><u>ISSUE BACKGROUND</u></b>	
<b>CLASS:</b>	Chain of Custody Issue (Field)
<b>TYPE:</b>	No/Illegible Relinquisher/Receiver Listed on COC
<b>DESCRIPTION:</b>	COC-W18-012-086, SAMPLES B3FK26 & B3FK22 there is a missing printed name in the fourth received by box.

<b><u>RESOLUTION</u></b>	
<b>PROPOSED RESOLUTION:</b>	DOCUMENT AND CLOSE

<b>FINAL RESOLUTION:</b>	DOCUMENT AND CLOSE
--------------------------	--------------------

<b>SUBMITTED BY:</b>	
KESSINGER, AL _____	02/12/2018 _____
<b>ACCEPTED BY:</b>	
NAGEL, SE _____	03/06/2018 _____

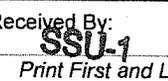
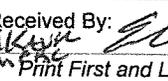
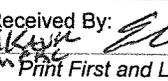
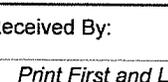
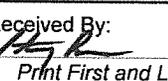
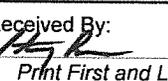
# **Chain of Custody and Supporting Documentation**

<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 2em; color: blue; font-weight: normal;">440273</span>	C.O.C.# <b>W18-012-086</b>
Page 1 of 1		
<b>Collector:</b> Roger Friesz Jr. /CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-012	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, DECEMBER 2017	<b>Logbook No.:</b> HNF-N-506 <span style="color: blue;">98/19</span>	<b>Ice Chest No.:</b> GWS-400
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 7710 2931 7645
<b>Protocol:</b> RCRA	<b>Priority:</b> 15 Days <b>PRIORITY</b>	<b>Offsite Property No.:</b> 8876

**POSSIBLE SAMPLE HAZARDS/REMARK**  
 \*\* \*\* Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS**  
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FK26	Y	W	12-15-17	1152	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B3FK22	N	W	↓	↓	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FK22	N	W	12-15-17	1152	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By:  Print First and Last Name: Roger Friesz Jr. Signature: 	Received By: <b>SSU-1</b> Print First and Last Name: SSU-1 Signature: 	Matrix * S = Soil      DS = Drum Solids SE = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By: <b>SSU-1</b> Print First and Last Name: SSU-1 Signature: 	Received By:  Print First and Last Name: SSU-1 Signature: 	
Relinquished By:  Print First and Last Name: NPRC Ed K... Signature: 	Received By: <b>FEDEX</b> Print First and Last Name: FEDEX Signature: 	
Relinquished By: <b>FEDEX</b> Print First and Last Name: FEDEX Signature: 	Received By:  Print First and Last Name: FEDEX Signature: 	
<b>FINAL SAMPLE DISPOSITION</b> Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:
		Date/Time:

<b>CH2MHill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">440273</span>	C.O.C.# <b>W18-012-085</b>
		Page 1 of 1

<b>Collector:</b> Roger Friesz J /CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-012	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, DECEMBER 2017	<b>Logbook No.:</b> HNF-N-506 98/19	<b>Ice Chest No.:</b> 625-400
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 771029317445
<b>Protocol:</b> RCRA	<b>Priority:</b> 15 Days <b>PRIORITY</b>	<b>Offsite Property No.:</b> 8876

**POSSIBLE SAMPLE HAZARDS/REMARK**  
 \*\* \*\* Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS**  
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FK25	Y	W	12-15-17	0640	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B3FK21	N	W	f	f	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FK21	N	W	12-15-17	0640	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

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March 6, 2018

Relinquished By: Roger Friesz J Signature: <i>[Signature]</i> Date/Time: DEC 15 2017 1340	Received By: SSU-1 Signature: <i>[Signature]</i> Date/Time: DEC 15 2017 1340	<b>Matrix *</b> S = Soil      DS = Drum Solids SE = Sediment    DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water        L = Liquid O = Oil            V = Vegetation A = Air            X = Other
Relinquished By: SSU-1 Signature: <i>[Signature]</i> Date/Time: DEC 18 2017 0948	Received By: <i>[Signature]</i> Signature: <i>[Signature]</i> Date/Time: DEC 18 2017 0948	
Relinquished By: <i>[Signature]</i> Signature: <i>[Signature]</i> Date/Time: DEC 18 2017 1400	Received By: FEDEX Signature: _____ Date/Time: _____	
Relinquished By: <i>[Signature]</i> Signature: <i>[Signature]</i> Date/Time: _____	Received By: <i>[Signature]</i> SLBOONE Signature: <i>[Signature]</i> Date/Time: 12-19-17 950	
<b>FINAL SAMPLE DISPOSITION</b> Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By: _____ Date/Time: _____

Revision 1



# **Data Review Qualifier Definitions**

## Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The analyte was detected in the associated method blank $\geq$ MDC or $>5\%$ sample activity.	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is $\geq$ EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

# Laboratory Certifications

## List of current GEL Certifications as of 02 January 2018

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL440273**  
**Work Order #: 440273**

**Product: Determination of Metals by ICP****Analytical Method:** SW846 3005A/6010D**Analytical Procedure:** GL-MA-E-013 REV# 30**Analytical Batch:** 1727456**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batch:** 1727455

The following samples were analyzed using the above methods and analytical procedure(s).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
440273001	B3FK25
440273002	B3FK21
440273003	B3FK26
440273004	B3FK22
1203941621	Method Blank (MB)ICP
1203941622	Laboratory Control Sample (LCS)
1203941625	440273001(B3FK25L) Serial Dilution (SD)
1203941623	440273001(B3FK25S) Matrix Spike (MS)
1203941624	440273001(B3FK25SD) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

**Data Summary:**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

**Calibration Information****Instrument Calibration**

The samples in this SDG did not contain potassium at concentrations higher than the RDL, therefore the data was not adversely affected. The samples in this SDG contained potassium at concentrations less than the MDL, therefore the data was not adversely affected. 440273001 (B3FK25), 440273002 (B3FK21), 440273003 (B3FK26) and 440273004 (B3FK22).

**Quality Control (QC) Information****Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the acceptance criteria. However, where there were negative values in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203941621 (MB)	Arsenic	See applicable report

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**GEL LABORATORIES LLC**

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL440273 GEL Work Order: 440273

**The Qualifiers in this report are defined as follows:**

\* Duplicate analysis not within control limits

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

D Results are reported from a diluted aliquot of sample.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:**



**Name: Kristen Mizzell**

**Date: 02 JAN 2018**

**Title: Team Leader**

# Sample Data Summary

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL440273

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID: 440273001

BASIS: As Received

DATE COLLECTED 15-DEC-17

CLIENT ID: B3FK25

LEVEL: Low

DATE RECEIVED 19-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-39-3	Barium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-47-3	Chromium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:46	122917-1	1727456
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	12/29/17 20:46	122917-1	1727456

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1727456	1727455	SW846 3005A	50	mL	50	mL	12/19/17	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL440273

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID: 440273002

BASIS: As Received

DATE COLLECTED 15-DEC-17

CLIENT ID: B3FK21

LEVEL: Low

DATE RECEIVED 19-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-39-3	Barium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-47-3	Chromium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:55	122917-1	1727456
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	12/29/17 20:55	122917-1	1727456

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1727456	1727455	SW846 3005A	50	mL	50	mL	12/19/17	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL440273

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID:440273003

BASIS: As Received

DATE COLLECTED 15-DEC-17

CLIENT ID: B3FK26

LEVEL: Low

DATE RECEIVED 19-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-39-3	Barium	53.4	ug/L		1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-70-2	Calcium	51200	ug/L		50	200	200	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-47-3	Chromium	190	ug/L		1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-50-8	Copper	3.41	ug/L	B	3	10	10	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7439-89-6	Iron	100	ug/L		30	100	100	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7439-95-4	Magnesium	16900	ug/L		110	300	300	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-09-7	Potassium	3950	ug/L		50	150	150	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-23-5	Sodium	19900	ug/L		100	300	300	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-62-2	Vanadium	24.3	ug/L		1	5	5	1	P	JWJ	12/29/17 20:58	122917-1	1727456
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	12/29/17 20:58	122917-1	1727456

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1727456	1727455	SW846 3005A	50	mL	50	mL	12/19/17	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL440273

CONTRACT: CPRCOW18012

METHOD TYPE: SW846

SAMPLE ID:440273004

BASIS: As Received

DATE COLLECTED 15-DEC-17

CLIENT ID: B3FK22

LEVEL: Low

DATE RECEIVED 19-DEC-17

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-39-3	Barium	53.3	ug/L		1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-70-2	Calcium	51400	ug/L		50	200	200	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-47-3	Chromium	193	ug/L		1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-50-8	Copper	4.6	ug/L	B	3	10	10	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7439-89-6	Iron	68.6	ug/L	B	30	100	100	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7439-95-4	Magnesium	16800	ug/L		110	300	300	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-09-7	Potassium	3890	ug/L		50	150	150	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-23-5	Sodium	19800	ug/L		100	300	300	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-62-2	Vanadium	23.9	ug/L		1	5	5	1	P	JWJ	12/29/17 21:01	122917-1	1727456
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	12/29/17 21:01	122917-1	1727456

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1727456	1727455	SW846 3005A	50	mL	50	mL	12/19/17	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

# Quality Control Summary

**QC Summary**

Report Date: January 2, 2018

Page 1 of 7

**CH2M Hill Plateau Remediation Company**

**MSIN R3-50 CHPRC**

**PO Box 1600**

**Richland, Washington**

**Contact: Mr. Scot Fitzgerald**

**Workorder: 440273**

<b>Parmname</b>	<b>NOM</b>	<b>Sample</b>	<b>Qual</b>	<b>QC</b>	<b>Units</b>	<b>RPD/D%</b>	<b>REC%</b>	<b>Range</b>	<b>Anlst</b>	<b>Date</b>	<b>Time</b>
<b>Metals Analysis-ICP</b>											
Batch	1727456										
QC1203941622	LCS										
Antimony	500			436	ug/L		87.3	(80%-120%)	JWJ	12/29/17	20:44
Arsenic	500			472	ug/L		94.4	(80%-120%)			
Barium	500			462	ug/L		92.4	(80%-120%)			
Cadmium	500			455	ug/L		91	(80%-120%)			
Calcium	5000			4840	ug/L		96.9	(80%-120%)			
Chromium	500			447	ug/L		89.5	(80%-120%)			
Cobalt	500			466	ug/L		93.2	(80%-120%)			
Copper	500			455	ug/L		91	(80%-120%)			
Iron	5000			4770	ug/L		95.4	(80%-120%)			
Magnesium	5000			4930	ug/L		98.5	(80%-120%)			
Manganese	500			454	ug/L		90.8	(80%-120%)			
Nickel	500			442	ug/L		88.5	(80%-120%)			
Potassium	5000			4650	ug/L		93.1	(80%-120%)			

**QC Summary**

Workorder: 440273

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1727456										
Silver	500			454	ug/L		90.9	(80%-120%)	JWJ	12/29/17	20:44
Sodium	5000			5220	ug/L		104	(80%-120%)			
Vanadium	500			448	ug/L		89.7	(80%-120%)			
Zinc	500			445	ug/L		88.9	(80%-120%)			
QC1203941621	MB										
Antimony			U	3.50	ug/L					12/29/17	20:41
Arsenic			B	-5.88	ug/L						
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L						
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						

**QC Summary**

Workorder: **440273**

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<b>Parname</b>	<b>NOM</b>	<b>Sample</b>	<b>Qual</b>	<b>QC</b>	<b>Units</b>	<b>RPD/D%</b>	<b>REC%</b>	<b>Range</b>	<b>Anlst</b>	<b>Date</b>	<b>Time</b>
<b>Metals Analysis-ICP</b>											
Batch	1727456										
Nickel			U	1.50	ug/L				JWJ	12/29/17	20:41
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						
QC1203941623 440273001 MS											
Antimony	500	U	3.50	452	ug/L		90.4	(75%-125%)		12/29/17	20:48
Arsenic	500	U	5.00	542	ug/L		108	(75%-125%)			
Barium	500	U	1.00	532	ug/L		106	(75%-125%)			
Cadmium	500	U	1.00	524	ug/L		105	(75%-125%)			
Calcium	5000	U	50.0	5530	ug/L		110	(75%-125%)			
Chromium	500	U	1.00	456	ug/L		91.2	(75%-125%)			
Cobalt	500	U	1.00	537	ug/L		107	(75%-125%)			
Copper	500	U	3.00	464	ug/L		92.7	(75%-125%)			
Iron	5000	U	30.0	5560	ug/L		111	(75%-125%)			

**QC Summary**

Workorder: **440273**

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<b>Parmname</b>	<b>NOM</b>	<b>Sample</b>	<b>Qual</b>	<b>QC</b>	<b>Units</b>	<b>RPD/D%</b>	<b>REC%</b>	<b>Range</b>	<b>Anlst</b>	<b>Date</b>	<b>Time</b>
<b>Metals Analysis-ICP</b>											
Batch	1727456										
Magnesium	5000	U	110	5570	ug/L		111	(75%-125%)	JWJ	12/29/17	20:48
Manganese	500	U	2.00	461	ug/L		92.1	(75%-125%)			
Nickel	500	U	1.50	451	ug/L		90.3	(75%-125%)			
Potassium	5000	U	50.0	5340	ug/L		106	(75%-125%)			
Silver	500	U	1.00	531	ug/L		106	(75%-125%)			
Sodium	5000	U	100	5410	ug/L		108	(75%-125%)			
Vanadium	500	U	1.00	464	ug/L		92.9	(75%-125%)			
Zinc	500	U	3.30	452	ug/L		90.2	(75%-125%)			
QC1203941624	440273001 MSD										
Antimony	500	U	3.50	475	ug/L	4.92	95	(0%-20%)		12/29/17	20:50
Arsenic	500	U	5.00	475	ug/L	13.1	95	(0%-20%)			
Barium	500	U	1.00	471	ug/L	12.2	94.1	(0%-20%)			
Cadmium	500	U	1.00	463	ug/L	12.4	92.6	(0%-20%)			
Calcium	5000	U	50.0	4900	ug/L	12.1	97.7	(0%-20%)			
Chromium	500	U	1.00	479	ug/L	4.76	95.7	(0%-20%)			
Cobalt	500	U	1.00	476	ug/L	12.1	95.2	(0%-20%)			

**QC Summary**

Workorder: **440273**

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<b>Parmname</b>	<b>NOM</b>	<b>Sample</b>	<b>Qual</b>	<b>QC</b>	<b>Units</b>	<b>RPD/D%</b>	<b>REC%</b>	<b>Range</b>	<b>Anlst</b>	<b>Date</b>	<b>Time</b>
<b>Metals Analysis-ICP</b>											
Batch	1727456										
Copper	500	U	3.00		485	ug/L	4.59	97.1	(0%-20%)	JWJ	12/29/17 20:50
Iron	5000	U	30.0		4880	ug/L	13	97.5	(0%-20%)		
Magnesium	5000	U	110		4920	ug/L	12.4	98.5	(0%-20%)		
Manganese	500	U	2.00		485	ug/L	5.18	97	(0%-20%)		
Nickel	500	U	1.50		476	ug/L	5.35	95.3	(0%-20%)		
Potassium	5000	U	50.0		4580	ug/L	15.3	91.1	(0%-20%)		
Silver	500	U	1.00		465	ug/L	13.3	92.9	(0%-20%)		
Sodium	5000	U	100		4540	ug/L	17.6	90.8	(0%-20%)		
Vanadium	500	U	1.00		482	ug/L	3.73	96.4	(0%-20%)		
Zinc	500	U	3.30		473	ug/L	4.53	94.4	(0%-20%)		
QC1203941625 440273001 SDILT											
Antimony		U	-2.83	DU	17.5	ug/L	N/A		(0%-20%)		12/29/17 20:52
Arsenic		U	-0.35	DU	25.0	ug/L	N/A		(0%-20%)		
Barium		U	0.0105	DU	5.00	ug/L	N/A		(0%-20%)		
Cadmium		U	0.233	DU	5.00	ug/L	N/A		(0%-20%)		
Calcium		U	10.8	DU	250	ug/L	N/A		(0%-20%)		

**QC Summary**

Workorder: 440273

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1727456										
Chromium	U	0.0391	DU	5.00	ug/L	N/A		(0%-20%)	JWJ	12/29/17	20:52
Cobalt	U	-0.117	DU	5.00	ug/L	N/A		(0%-20%)			
Copper	U	-0.17	DU	15.0	ug/L	N/A		(0%-20%)			
Iron	U	2.92	DU	150	ug/L	N/A		(0%-20%)			
Magnesium	U	-10.3	DU	550	ug/L	N/A		(0%-20%)			
Manganese	U	0.0767	DU	10.0	ug/L	N/A		(0%-20%)			
Nickel	U	-0.378	DU	7.50	ug/L	N/A		(0%-20%)			
Potassium	U	24.1	BD	63.2	ug/L	N/A		(0%-20%)			
Silver	U	0.405	DU	5.00	ug/L	N/A		(0%-20%)			
Sodium	U	-8.5	DU	500	ug/L	N/A		(0%-20%)			
Vanadium	U	0.0173	DU	5.00	ug/L	N/A		(0%-20%)			
Zinc	U	1.25	DU	16.5	ug/L	N/A		(0%-20%)			

**Notes:**

The Qualifiers in this report are defined as follows:

- \* Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.

**QC Summary**

Workorder: 440273

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
E	Reported value is estimated due to interferences. See comment in narrative.										
M	Duplicate precision not met.										
N	Spike Sample recovery is outside control limits.										
S	Reported value determined by the Method of Standard Additions (MSA)										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.  
 ^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.  
 \* Indicates that a Quality Control parameter was not within specifications.  
 For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# General Chem Analysis

# Case Narrative

**General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL440273  
Work Order #: 440273**

**Product: Alkalinity**

**Analytical Method:** 2320\_ALKALINITY

**Analytical Procedure:** GL-GC-E-033 REV# 13

**Analytical Batch:** 1727519

The following samples were analyzed using the above methods and analytical procedure(s).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
440273002	B3FK21
440273004	B3FK22
1203941754	Laboratory Control Sample (LCS)
1203941755	440092002(B3FKD4) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

**Data Summary:**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**GEL LABORATORIES LLC**

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL440273 GEL Work Order: 440273

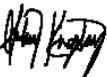
**The Qualifiers in this report are defined as follows:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Aubrey Kingsbury

Date: 26 DEC 2017

Title: Analyst I

# Sample Data Summary

## Certificate of Analysis

Report Date: December 26, 2017

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-012

---

Client Sample ID: B3FK21	Project: CPRCOW18012
Sample ID: 440273002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 15-DEC-17 06:40	
Receive Date: 19-DEC-17	
Collector: Client	

---

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3	U	1450	1450	4000	ug/L			RXB5	12/21/17	1747	1727519	1

The following Analytical Methods were performed:

---

Method	Description	Analyst	Comments
1	2320_ALKALINITY		

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

**Certificate of Analysis**

Report Date: December 26, 2017

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-012

---

Client Sample ID: B3FK22	Project: CPRCOW18012
Sample ID: 440273004	Client ID: CPRC001
Matrix: WATER	
Collect Date: 15-DEC-17 11:52	
Receive Date: 19-DEC-17	
Collector: Client	

---

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		99000	1450	4000	ug/L			RXB5	12/21/17	1751	1727519	1

The following Analytical Methods were performed:

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Method	Description	Analyst	Comments
1	2320_ALKALINITY		

**Notes:**

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# Quality Control Summary

**QC Summary**

Report Date: December 26, 2017

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**CH2M Hill Plateau Remediation Company**  
**MSIN R3-50 CHPRC**  
**PO Box 1600**  
**Richland, Washington**

**Contact: Mr. Scot Fitzgerald**

**Workorder: 440273**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1727519										
QC1203941755	440092002	DUP									
Alkalinity, Total as CaCO3		90000		90000	ug/L	0		(0%-20%)	RXB5	12/21/17	16:55
QC1203941754	LCS										
Alkalinity, Total as CaCO3	100000			107000	ug/L		107	(80%-120%)		12/21/17	16:53

**Notes:**

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is  $\geq$  EQL or is  $>$  5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.  
 ^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

\* Indicates that a Quality Control parameter was not within specifications.  
 For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.