

June 28, 2016



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June 27, 2016

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

Re: CHPRC SAF W16-006  
Work Order: 399103  
SDG: GEL399103

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 10, 2016. 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,

A handwritten signature in cursive script that reads "Heather Shaffer".

Heather Shaffer  
Project Manager

Purchase Order: 300071 - 7H  
Chain of Custody: W16-006-045 and W16-006-057  
Enclosures



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# Case Narrative

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF W16-006  
SDG: GEL399103

June 27, 2016

**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 June 10, 2016, 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 and DER.

**Sample Identification**

The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
399103001	B35857
399103002	B35859
399103003	B357W9
399103004	B357X1

**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.

June 28, 2016

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, 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 #: GEL399103  
Work Order #: 399103

**GC/MS Volatile**

**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**

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**

**Continuing Calibration Verification Requirements**

The calibration verification standard requirements were not all met for samples 1203565407 (MB), 1203565408 (LCS) and 399103001 (B35857) . n-Butyl alcohol recovered at 22.1% in the daily CCV analyzed on 6/10/16. There were no positive results for any of the analytes that were outside the calibration criteria. The results are reported.

**Quality Control (QC) Information**

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203564766 (Non SDG 398674001PS)	1,1-Dichloroethylene	135* (70%-130%)
	Acetone	61* (70%-130%)
1203564767 (Non SDG 398674001PSD)	1,1-Dichloroethylene	139* (70%-130%)
	Acetone	61* (70%-130%)

**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**

**CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of

potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 399103001 (B35857), 399103002 (B35859), 399103003 (B357W9) and 399103004 (B357X1).

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of potassium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203566362 (MB).

**Determination of Metals by ICP-MS**

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.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of antimony and arsenic. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

**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.

# **Chain of Custody and Supporting Documentation**

<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		C.O.C. # <b>W16-006-057</b>					
		Page 1 of 1					
CH2M Hill Plateau Remediation Company Collector: K.C. Patterson/CHPRC SAF No. W16-006 Project Title: RCRA, JUNE 2016 Shipped To (Lab): GEL Laboratories, LLC Protocol: RCRA		Telephone No. 509-376-4650 Purchase Order/Charge Code 300071 Ice Chest No. <i>625-559</i> Bill of Lading/Air Bill No. <i>1776481818285</i> Offsite Property No. <i>6710</i>					
Contact/Requester: Karen Waters-Husted Sampling Origin: Hanford Site Logbook No. HNF-N-506 <i>8385</i> Method of Shipment: Commercial Carrier Priority: 30 Days <b>PRIORITY</b>		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					
SPECIAL INSTRUCTIONS: N/A POSSIBLE SAMPLE HAZARDS/REMARKS: *** 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							
Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35857	N	W JUN 08 2016	1217	1x500-mL GIP	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B35857	N	W JUN 08 2016	↓	4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW 01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35859	Y	W JUN 08 2016	↓	1x500-mL GIP	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By: K.C. Patterson/CHPRC	Print: <i>[Signature]</i>	Received By: SSU-1	Sign: <i>[Signature]</i>	Date/Time: JUN 08 2016 1415	Matrix * S = Soil, DS = Drum Solids, SE = Sediment, DL = Drum Liquids, SO = Solid, T = Tissue, SL = Sludge, WI = Wipe, LW = Water, O = Oil, A = Air, V = Vegetation, X = Other
Relinquished By: SSU-1	Print: <i>[Signature]</i>	Received By: J.C. Fulton/CHPRC	Sign: <i>[Signature]</i>	Date/Time: JUN 09 2016 0900	
Relinquished By: J.C. Fulton/CHPRC	Print: <i>[Signature]</i>	Received By: FEDEX	Sign: <i>[Signature]</i>	Date/Time: JUN 09 2016 1400	
Relinquished By: <i>[Signature]</i>	Print: <i>[Signature]</i>	Received By: <i>[Signature]</i>	Sign: <i>[Signature]</i>	Date/Time: JUN 10 2016 0905	
Disposed By: <i>[Signature]</i>				Date/Time: JUN 10 2016 0905	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)					
FINAL SAMPLE DISPOSITION: 58					

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# W16-006-045  
Page 1 of 1

399103

Collector: K.C. Patterson/CHPRC  
 SAF No.: W16-006  
 Project Title: RCRA, JUNE 2016  
 Shipped To (Lab): GEL Laboratories, LLC  
 Protocol: RCRA  
 Contact/Requester: Karen Waters-Husted  
 Sampling Origin: Hanford Site  
 Logbook No.: HNF-N-506 83183+84  
 Method of Shipment: Commercial Carrier  
 Priority: 30 Days  
 Telephone No.: 509-376-4650  
 Purchase Order/Charge Code: 300071  
 Ice Chest No.: GEDS-557  
 Bill of Lading/Air Bill No.: 770481818285  
 Offsite Property No.: 6710

SPECIAL INSTRUCTIONS: N/A  
 Hold Time: 30 Days  
 Hold Time: 14 Days  
 Hold Time: 6 Months  
 Hold Time: 6 Months  
 Total Activity Exemption: Yes  No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B357W9	N	WJUN 07 2016	1200	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B357W9	N	W	↓	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B357X1	Y	W	↓	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

POSSIBLE SAMPLE HAZARDS/REMARKS

\*\*\* 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

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
K.C. Patterson/CHPRC			JUN 07 2016 1455	SSU-1			JUN 07 2016 1455	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			JUN 09 2016 0800	J.C. Fulton/CHPRC			JUN 09 2016 0800	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			JUN 09 2016 1400	FEDEF			JUN 09 2016 0905	

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By:

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>399103</u>
Received By: <u>Sara Inball</u>		Date Received: <u>6/10/16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 cpm</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>E5162009184</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other 7764 8629 0184 3°C 7764 8181 8285 2°C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 6/10/16 Page 1 of 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 associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is $\geq$ MDA for this sample	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 27 June 2016**

<b>State</b>	<b>Certification</b>
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	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# Volatile Analysis

# Case Narrative

**GC/MS Volatile  
 Technical Case Narrative  
 CH2MHill Plateau Remediation Company (CPRC)  
 SDG #: GEL399103  
 Work Order #: 399103**

**Product: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**

**Analytical Method: SW846 8260C**

**Analytical Procedure: GL-OA-E-038 REV# 22**

**Analytical Batch: 1573480**

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>
399103001	B35857
1203564764	Method Blank (MB)
1203564765	Laboratory Control Sample (LCS)
1203564766	398674001(NonSDG) Post Spike (PS)
1203564767	398674001(NonSDG) Post Spike Duplicate (PSD)
1203565407	Method Blank (MB)
1203565408	Laboratory Control Sample (LCS)

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**

**Continuing Calibration Verification Requirements**

The calibration verification standard requirements were not all met for samples 1203565407 (MB), 1203565408 (LCS) and 399103001 (B35857) . n-Butyl alcohol recovered at 22.1% in the daily CCV analyzed on 6/10/16. There were no positive results for any of the analytes that were outside the calibration criteria. The results are reported.

**Quality Control (QC) Information**

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203564766 (Non SDG 398674001PS)	1,1-Dichloroethylene	135* (70%-130%)
	Acetone	61* (70%-130%)
1203564767 (Non SDG 398674001PSD)	1,1-Dichloroethylene	139* (70%-130%)
	Acetone	61* (70%-130%)

**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: GEL399103 GEL Work Order: 399103

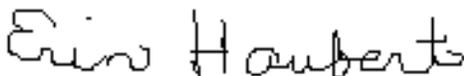
**The Qualifiers in this report are defined as follows:**

- T Spike and/or spike duplicate 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.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

**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: Erin Haubert

Date: 24 JUN 2016

Title: Data Validator

# Sample Data Summary

Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number:	GEL399103	Date Collected:	06/08/2016 12:17	Matrix:	WATER
Lab Sample ID:	399103001	Date Received:	06/10/2016 09:05	Client:	CPRC001
Client ID:	B35857	Method:	SW846 8260C	Project:	CPRC0W16006
Batch ID:	1573480	Inst:	VOA3.I	SOP Ref:	GL-OA-E-038
Run Date:	06/10/2016 16:24	Analyst:	CDS1	Dilution:	1
Prep Date:	06/10/2016 16:24	Column:	DB-624	Purge Vol:	5 mL
Data File:	061016V3\3M516.D				

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	TU	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	U	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
107-12-0	Propionitrile	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0
109-99-9	Tetrahydrofuran	U	1.50	ug/L	1.50	10.0	50.0
71-36-3	n-Butyl alcohol	U	83.3	ug/L	83.3	250	100

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 24, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
QC1203564765	LCS										
1,1,1-Trichloroethane	50.0			53.7	ug/L		107	(70%-130%)	CDS1	06/09/16	11:38
1,1,2-Trichloroethane	50.0			44.0	ug/L		88	(70%-130%)			
1,1-Dichloroethane	50.0			52.7	ug/L		105	(70%-130%)			
1,1-Dichloroethylene	50.0			54.5	ug/L		109	(70%-130%)			
1,2-Dichloroethane	50.0			49.7	ug/L		99	(70%-130%)			
1,4-Dichlorobenzene	50.0			46.2	ug/L		92	(70%-130%)			
2-Butanone	250			269	ug/L		108	(70%-130%)			
4-Methyl-2-pentanone	250			230	ug/L		92	(70%-130%)			
Acetone	250			254	ug/L		102	(70%-130%)			
Benzene	50.0			50.4	ug/L		101	(70%-130%)			
Carbon disulfide	250			247	ug/L		99	(70%-130%)			
Carbon tetrachloride	50.0			51.0	ug/L		102	(70%-130%)			
Chlorobenzene	50.0			46.4	ug/L		93	(70%-130%)			
Chloroform	50.0			48.9	ug/L		98	(70%-130%)			
Ethylbenzene	50.0			48.1	ug/L		96	(70%-130%)			
Methylene chloride	50.0			47.0	ug/L		94	(70%-130%)			
Tetrachloroethylene	50.0			46.2	ug/L		92	(70%-130%)			
Toluene	50.0			43.4	ug/L		87	(70%-130%)			
Trichloroethylene	50.0			51.4	ug/L		103	(70%-130%)			
Vinyl chloride	50.0			57.5	ug/L		115	(70%-130%)			

June 28, 2016

### GEL LABORATORIES LLC

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

## QC Summary

Workorder: 399103

Page 2 of 9

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Xylenes (total)	150			143	ug/L		95	(70%-130%)	CDS1	06/09/16	11:38
cis-1,2-Dichloroethylene	50.0			48.1	ug/L		96	(70%-130%)			
n-Butyl alcohol	5000			5270	ug/L		105	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			51.8	ug/L		104	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			52.4	ug/L		105	(70%-130%)			
**Bromofluorobenzene	50.0			53.5	ug/L		107	(70%-130%)			
**Toluene-d8	50.0			47.2	ug/L		94	(70%-130%)			
QC1203565408	LCS										
1,1,1-Trichloroethane	50.0			58.4	ug/L		117	(70%-130%)		06/10/16	09:16
1,1,2-Trichloroethane	50.0			47.7	ug/L		95	(70%-130%)			
1,1-Dichloroethane	50.0			56.2	ug/L		112	(70%-130%)			
1,1-Dichloroethylene	50.0			59.6	ug/L		119	(70%-130%)			
1,2-Dichloroethane	50.0			53.7	ug/L		107	(70%-130%)			
1,4-Dichlorobenzene	50.0			49.4	ug/L		99	(70%-130%)			
2-Butanone	250			295	ug/L		118	(70%-130%)			
4-Methyl-2-pentanone	250			253	ug/L		101	(70%-130%)			
Acetone	250			281	ug/L		112	(70%-130%)			
Benzene	50.0			53.8	ug/L		108	(70%-130%)			
Carbon disulfide	250			280	ug/L		112	(70%-130%)			
Carbon tetrachloride	50.0			55.8	ug/L		112	(70%-130%)			
Chlorobenzene	50.0			49.6	ug/L		99	(70%-130%)			
Chloroform	50.0			52.7	ug/L		105	(70%-130%)			

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Ethylbenzene	50.0			51.6	ug/L		103	(70%-130%)	CDS1	06/10/16	09:16
Methylene chloride	50.0			50.1	ug/L		100	(70%-130%)			
Tetrachloroethylene	50.0			50.5	ug/L		101	(70%-130%)			
Toluene	50.0			50.7	ug/L		101	(70%-130%)			
Trichloroethylene	50.0			55.4	ug/L		111	(70%-130%)			
Vinyl chloride	50.0			57.0	ug/L		114	(70%-130%)			
Xylenes (total)	150			154	ug/L		103	(70%-130%)			
cis-1,2-Dichloroethylene	50.0			52.9	ug/L		106	(70%-130%)			
n-Butyl alcohol	5000			6120	ug/L		122	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			55.1	ug/L		110	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			50.1	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0			51.8	ug/L		104	(70%-130%)			
**Toluene-d8	50.0			46.7	ug/L		93	(70%-130%)			
QC1203564764	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/09/16	12:39
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
1,4-Dichlorobenzene			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Acetone			U	3.00	ug/L				CDS1	06/09/16	12:39
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Propionitrile			U	3.00	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Tetrahydrofuran			U	1.50	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
n-Butyl alcohol			U	83.3	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.7	ug/L		103	(70%-130%)			
**Bromofluorobenzene	50.0			51.7	ug/L		103	(70%-130%)			
**Toluene-d8	50.0			49.2	ug/L		98	(70%-130%)			

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
QC1203565407	MB										
1,1,1-Trichloroethane			U	0.300	ug/L				CDS1	06/10/16	10:48
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
1,4-Dichlorobenzene			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Propionitrile			U	3.00	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Tetrahydrofuran			U	1.50	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						

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QC Summary

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Xylenes (total)			U	0.300	ug/L				CDS1	06/10/16	10:48
cis-1,2-Dichloroethylene			U	0.300	ug/L						
n-Butyl alcohol			U	83.3	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.8	ug/L		104	(70%-130%)			
**Bromofluorobenzene	50.0			52.7	ug/L		105	(70%-130%)			
**Toluene-d8	50.0			48.2	ug/L		96	(70%-130%)			
QC1203564766 398674001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	64.2	ug/L		128	(70%-130%)		06/09/16	20:17
1,1,2-Trichloroethane	50.0	U	0.00	53.6	ug/L		107	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	64.8	ug/L		130	(70%-130%)			
1,1-Dichloroethylene	50.0	TU	0.00 T	67.5	ug/L		135 *	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	61.7	ug/L		123	(70%-130%)			
1,4-Dichlorobenzene	50.0	U	0.00	53.9	ug/L		108	(70%-130%)			
2-Butanone	250	U	0.00	198	ug/L		79	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	274	ug/L		110	(70%-130%)			
Acetone	250	TU	0.00 T	152	ug/L		61 *	(70%-130%)			
Benzene	50.0	U	0.00	60.5	ug/L		121	(70%-130%)			
Carbon disulfide	250	U	0.00	318	ug/L		127	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	59.8	ug/L		120	(70%-130%)			
Chlorobenzene	50.0	U	0.00	57.6	ug/L		115	(70%-130%)			
Chloroform	50.0	U	0.00	59.0	ug/L		118	(70%-130%)			

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QC Summary

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Ethylbenzene	50.0	U	0.00	59.4	ug/L		119	(70%-130%)	CDS1	06/09/16	20:17
Methylene chloride	50.0	J	2.69	57.0	ug/L		109	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	56.6	ug/L		113	(70%-130%)			
Toluene	50.0	U	0.00	58.8	ug/L		118	(70%-130%)			
Trichloroethylene	50.0	U	0.00	59.8	ug/L		120	(70%-130%)			
Vinyl chloride	50.0	U	0.00	58.6	ug/L		117	(70%-130%)			
Xylenes (total)	150	U	0.00	178	ug/L		119	(70%-130%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	59.2	ug/L		118	(70%-130%)			
n-Butyl alcohol	5000	U	0.00	5850	ug/L		117	(70%-130%)			
trans-1,2-Dichloroethylene	50.0	U	0.00	61.7	ug/L		123	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		53.5	52.1	ug/L		104	(70%-130%)			
**Bromofluorobenzene	50.0		50.3	52.9	ug/L		106	(70%-130%)			
**Toluene-d8	50.0		50.1	50.9	ug/L		102	(70%-130%)			
QC1203564767 398674001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	64.7	ug/L	1	129	(0%-20%)		06/09/16	20:48
1,1,2-Trichloroethane	50.0	U	0.00	50.7	ug/L	6	101	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	64.7	ug/L	0	129	(0%-20%)			
1,1-Dichloroethylene	50.0	TU	0.00	69.6	ug/L	3	139*	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	62.1	ug/L	1	124	(0%-20%)			
1,4-Dichlorobenzene	50.0	U	0.00	50.9	ug/L	6	102	(0%-20%)			
2-Butanone	250	U	0.00	195	ug/L	2	78	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	258	ug/L	6	103	(0%-20%)			

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1573480										
Acetone	250	TU	0.00	T	153	ug/L	1	61 *	(0%-20%)	CDS1	06/09/16 20:48
Benzene	50.0	U	0.00		60.1	ug/L	1	120	(0%-20%)		
Carbon disulfide	250	U	0.00		317	ug/L	0	127	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		61.2	ug/L	2	122	(0%-20%)		
Chlorobenzene	50.0	U	0.00		53.2	ug/L	8	106	(0%-20%)		
Chloroform	50.0	U	0.00		58.2	ug/L	1	116	(0%-20%)		
Ethylbenzene	50.0	U	0.00		56.2	ug/L	5	112	(0%-20%)		
Methylene chloride	50.0	J	2.69		56.4	ug/L	1	107	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		52.7	ug/L	7	105	(0%-20%)		
Toluene	50.0	U	0.00		53.4	ug/L	10	107	(0%-20%)		
Trichloroethylene	50.0	U	0.00		61.4	ug/L	3	123	(0%-20%)		
Vinyl chloride	50.0	U	0.00		52.6	ug/L	11	105	(0%-20%)		
Xylenes (total)	150	U	0.00		169	ug/L	5	113	(0%-20%)		
cis-1,2-Dichloroethylene	50.0	U	0.00		59.4	ug/L	0	119	(0%-20%)		
n-Butyl alcohol	5000	U	0.00		5630	ug/L	4	113	(0%-20%)		
trans-1,2-Dichloroethylene	50.0	U	0.00		63.2	ug/L	2	126	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		53.5		51.5	ug/L		103	(70%-130%)		
**Bromofluorobenzene	50.0		50.3		52.3	ug/L		105	(70%-130%)		
**Toluene-d8	50.0		50.1		47.3	ug/L		95	(70%-130%)		

**Notes:**

The Qualifiers in this report are defined as follows:

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
A	The TIC is a suspected aldol-condensation product										
B	The analyte was detected in both the associated QC blank and in the sample.										
C	Analyte has been confirmed by GC/MS analysis										
D	Results are reported from a diluted aliquot of sample.										
E	Concentration exceeds the calibration range of the instrument										
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										
N	Spike Sample recovery is outside control limits.										
P	Aroclor target analyte with greater than 25% difference between column analyses.										
T	Spike and/or spike duplicate 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										
o	Analyte failed to recover within LCS limits (Organics only)										

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.

## Surrogate Recovery Report

SDG Number: GEL399103

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203564765	LCS for batch 1573480	105	94	107
1203564764	MB for batch 1573480	103	98	103
1203564766	B34WT5PS	104	102	106
1203564767	B34WT5PSD	103	95	105
1203565408	LCS for batch 1573480	100	93	104
1203565407	MB for batch 1573480	104	96	105
399103001	B35857	110	103	100

**Surrogate****Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4 (70%-130%)  
TOL = Toluene-d8 (70%-130%)  
BFB = Bromofluorobenzene (70%-130%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# Metals Analysis

# Case Narrative

Metals  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399103  
Work Order #: 399103

**Product:** Determination of Metals by ICP-MS  
**Analytical Method:** 6020\_METALS\_ICPMS  
**Analytical Procedure:** GL-MA-E-014 REV# 28  
**Analytical Batch:** 1574072

**Product:** Determination of Metals by ICP  
**Analytical Method:** 6010\_METALS\_ICP  
**Analytical Procedure:** GL-MA-E-013 REV# 26  
**Analytical Batch:** 1574121

**Preparation Method:** SW846 3005A  
**Preparation Procedure:** GL-MA-E-006 REV# 13  
**Preparation Batches:** 1574071 and 1574120

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399103001	B35857
399103002	B35859
399103003	B357W9
399103004	B357X1
1203566362	Method Blank (MB)ICP
1203566363	Laboratory Control Sample (LCS)
1203566366	399103001(B35857L) Serial Dilution (SD)
1203566364	399103001(B35857S) Matrix Spike (MS)
1203566365	399103001(B35857SD) Matrix Spike Duplicate (MSD)
1203566209	Method Blank (MB)ICP-MS
1203566210	Laboratory Control Sample (LCS)
1203566213	399216001(NonSDGL) Serial Dilution (SD)
1203566212	399216001(NonSDGS) Matrix Spike (MS)
1203566214	399216001(NonSDGSD) 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**

**CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 399103001 (B35857), 399103002 (B35859), 399103003 (B357W9) and

399103004 (B357X1)-ICP.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of potassium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203566362 (MB)-ICP. The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of antimony and arsenic. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. ICP-MS.

**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**

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399103 GEL Work Order: 399103

**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.
- 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.

**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:** Nik-Cole Elmore

**Date:** 27 JUN 2016

**Title:** Data Validator

# Sample Data Summary

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

**SDG No:** GEL399103

**CONTRACT:** CPRC0W16006

**METHOD TYPE:** SW846

**SAMPLE ID:**399103001

**BASIS:** As Received

**DATE COLLECTED** 08-JUN-16

**CLIENT ID:** B35857

**LEVEL:** Low

**DATE RECEIVED** 10-JUN-16

**MATRIX:** WATER

**%SOLIDS:** 0

CAS No.	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	HSC	06/20/16 15:51	062016-1	1574121
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	06/23/16 09:12	062316-2	1574121
7440-39-3	Barium	58.8	ug/L		1	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-70-2	Calcium	47300	ug/L		50	200	200	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-47-3	Chromium	3.95	ug/L	B	1	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	06/20/16 15:51	062016-1	1574121
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/16 15:51	062016-1	1574121
7439-95-4	Magnesium	11200	ug/L		110	300	300	1	P	HSC	06/20/16 15:51	062016-1	1574121
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-09-7	Potassium	8700	ug/L		50	150	150	1	P	HSC	06/23/16 09:12	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-23-5	Sodium	28300	ug/L		100	300	300	1	P	HSC	06/20/16 15:51	062016-1	1574121
7440-61-1	Uranium	27.6	ug/L		0.067	0.2	15	1	MS	PRB	06/24/16 23:46	160624-8	1574072
7440-62-2	Vanadium	14	ug/L		1	5	5	1	P	HSC	06/23/16 09:12	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 15:51	062016-1	1574121

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574072	1574071	SW846 3005A	50	mL	50	mL	06/14/16	JP1
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A

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

**SDG No:** GEL399103

**CONTRACT:** CPRC0W16006

**METHOD TYPE:** SW846

**SAMPLE ID:**399103002

**BASIS:** As Received

**DATE COLLECTED** 08-JUN-16

**CLIENT ID:** B35859

**LEVEL:** Low

**DATE RECEIVED** 10-JUN-16

**MATRIX:** WATER

**%SOLIDS:** 0

CAS No.	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	HSC	06/20/16 16:03	062016-1	1574121
7440-38-2	Arsenic	6.48	ug/L	B	5	30	30	1	P	HSC	06/23/16 09:23	062316-2	1574121
7440-39-3	Barium	61.4	ug/L		1	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-70-2	Calcium	48400	ug/L		50	200	200	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-47-3	Chromium	3.32	ug/L	B	1	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	06/20/16 16:03	062016-1	1574121
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/16 16:03	062016-1	1574121
7439-95-4	Magnesium	11400	ug/L		110	300	300	1	P	HSC	06/20/16 16:03	062016-1	1574121
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-09-7	Potassium	8770	ug/L		50	150	150	1	P	HSC	06/23/16 09:23	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-23-5	Sodium	29000	ug/L		100	300	300	1	P	HSC	06/20/16 16:03	062016-1	1574121
7440-62-2	Vanadium	14.1	ug/L		1	5	5	1	P	HSC	06/23/16 09:23	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 16:03	062016-1	1574121

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

**\*Analytical Methods:**

P SW846 3005A/6010C

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

**SDG No:** GEL399103

**CONTRACT:** CPRC0W16006

**METHOD TYPE:** SW846

**SAMPLE ID:**399103003

**BASIS:** As Received

**DATE COLLECTED** 07-JUN-16

**CLIENT ID:** B357W9

**LEVEL:** Low

**DATE RECEIVED** 10-JUN-16

**MATRIX:** WATER

**%SOLIDS:** 0

CAS No.	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	HSC	06/20/16 16:06	062016-1	1574121
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	06/23/16 09:26	062316-2	1574121
7440-39-3	Barium	39.2	ug/L		1	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-70-2	Calcium	26300	ug/L		50	200	200	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-47-3	Chromium	35.1	ug/L		1	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	06/20/16 16:06	062016-1	1574121
7439-89-6	Iron	169	ug/L		30	100	100	1	P	HSC	06/20/16 16:06	062016-1	1574121
7439-95-4	Magnesium	8510	ug/L		110	300	300	1	P	HSC	06/20/16 16:06	062016-1	1574121
7439-96-5	Manganese	4.78	ug/L	B	2	10	10	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-02-0	Nickel	4.85	ug/L	B	1.5	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-09-7	Potassium	3750	ug/L		50	150	150	1	P	HSC	06/23/16 09:26	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-23-5	Sodium	19100	ug/L		100	300	300	1	P	HSC	06/20/16 16:06	062016-1	1574121
7440-62-2	Vanadium	25.1	ug/L		1	5	5	1	P	HSC	06/23/16 09:26	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 16:06	062016-1	1574121

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

**\*Analytical Methods:**

P SW846 3005A/6010C

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

**SDG No:** GEL399103

**CONTRACT:** CPRC0W16006

**METHOD TYPE:** SW846

**SAMPLE ID:**399103004

**BASIS:** As Received

**DATE COLLECTED** 07-JUN-16

**CLIENT ID:** B357X1

**LEVEL:** Low

**DATE RECEIVED** 10-JUN-16

**MATRIX:** WATER

**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	4.17	ug/L	B	3.5	10	10	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	06/23/16 09:29	062316-2	1574121
7440-39-3	Barium	37.3	ug/L		1	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-70-2	Calcium	26200	ug/L		50	200	200	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-47-3	Chromium	32.3	ug/L		1	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	06/20/16 16:09	062016-1	1574121
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/16 16:09	062016-1	1574121
7439-95-4	Magnesium	8430	ug/L		110	300	300	1	P	HSC	06/20/16 16:09	062016-1	1574121
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-02-0	Nickel	3.88	ug/L	B	1.5	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-09-7	Potassium	3880	ug/L		50	150	150	1	P	HSC	06/23/16 09:29	062316-2	1574121
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-23-5	Sodium	19100	ug/L		100	300	300	1	P	HSC	06/20/16 16:09	062016-1	1574121
7440-62-2	Vanadium	24.5	ug/L		1	5	5	1	P	HSC	06/23/16 09:29	062316-2	1574121
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	06/20/16 16:09	062016-1	1574121

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1574121	1574120	SW846 3005A	50	mL	50	mL	06/14/16	JP1

**\*Analytical Methods:**

P SW846 3005A/6010C

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 27, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis - ICPMS</b>											
Batch	1574072										
QC1203566210		LCS									
Uranium	50.0			49.1	ug/L		98.1	(80%-120%)	PRB	06/24/16	23:39
QC1203566209		MB									
Uranium			U	0.067	ug/L					06/24/16	23:36
QC1203566212		399216001	MS								
Uranium	50.0		1.86	51.1	ug/L		98.6	(75%-125%)		06/24/16	23:52
QC1203566214		399216001	MSD								
Uranium	50.0		1.86	49.4	ug/L	3.42	95.1	(0%-20%)		06/24/16	23:55
QC1203566213		399216001	SDILT								
Uranium			1.86 D	0.365	ug/L	2.04		(0%-10%)		06/25/16	00:01
<b>Metals Analysis-ICP</b>											
Batch	1574121										
QC1203566363		LCS									
Antimony	500			486	ug/L		97.2	(80%-120%)	HSC	06/20/16	15:48
Arsenic	500			495	ug/L		98.9	(80%-120%)		06/23/16	09:09
Barium	500			493	ug/L		98.6	(80%-120%)		06/20/16	15:48
Cadmium	500			483	ug/L		96.6	(80%-120%)			
Calcium	5000			4950	ug/L		99	(80%-120%)			
Chromium	500			487	ug/L		97.5	(80%-120%)			
Cobalt	500			486	ug/L		97.1	(80%-120%)			
Copper	500			496	ug/L		99.3	(80%-120%)			
Iron	5000			4960	ug/L		99.2	(80%-120%)			
Magnesium	5000			4970	ug/L		99.4	(80%-120%)			
Manganese	500			488	ug/L		97.6	(80%-120%)			
Nickel	500			482	ug/L		96.4	(80%-120%)			

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1574121										
Potassium	5000			4840	ug/L		96.9	(80%-120%)	HSC	06/23/16	09:09
Silver	500			490	ug/L		98	(80%-120%)		06/20/16	15:48
Sodium	5000			5010	ug/L		100	(80%-120%)			
Vanadium	500			483	ug/L		96.5	(80%-120%)		06/23/16	09:09
Zinc	500			472	ug/L		94.4	(80%-120%)		06/20/16	15:48
QC1203566362	MB										
Antimony			U	3.50	ug/L					06/20/16	15:46
Arsenic			U	5.00	ug/L					06/23/16	09:06
Barium			U	1.00	ug/L					06/20/16	15:46
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						
Nickel			U	1.50	ug/L						
Potassium			B	74.5	ug/L					06/23/16	09:06
Silver			U	1.00	ug/L					06/20/16	15:46
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L					06/23/16	09:06

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1574121										
Zinc			U	3.30	ug/L				HSC	06/20/16	15:46
QC1203566364 399103001 MS											
Antimony	500	U	3.50	492	ug/L		98.4	(75%-125%)		06/20/16	15:54
Arsenic	500	U	5.00	512	ug/L		102	(75%-125%)		06/23/16	09:15
Barium	500		58.8	549	ug/L		98	(75%-125%)		06/20/16	15:54
Cadmium	500	U	1.00	482	ug/L		96.3	(75%-125%)			
Calcium	5000		47300	53500	ug/L		N/A	(75%-125%)			
Chromium	500	B	3.95	488	ug/L		96.8	(75%-125%)			
Cobalt	500	U	1.00	468	ug/L		93.6	(75%-125%)			
Copper	500	U	3.00	501	ug/L		99.9	(75%-125%)			
Iron	5000	U	30.0	4880	ug/L		97.6	(75%-125%)			
Magnesium	5000		11200	16500	ug/L		105	(75%-125%)			
Manganese	500	U	2.00	480	ug/L		95.8	(75%-125%)			
Nickel	500	U	1.50	464	ug/L		92.6	(75%-125%)			
Potassium	5000		8700	13700	ug/L		99.3	(75%-125%)		06/23/16	09:15
Silver	500	U	1.00	490	ug/L		98	(75%-125%)		06/20/16	15:54
Sodium	5000		28300	33900	ug/L		N/A	(75%-125%)			
Vanadium	500		14.0	504	ug/L		98.1	(75%-125%)		06/23/16	09:15
Zinc	500	U	3.30	467	ug/L		93.4	(75%-125%)		06/20/16	15:54
QC1203566365 399103001 MSD											
Antimony	500	U	3.50	496	ug/L	0.686	99.1	(0%-20%)		06/20/16	15:57
Arsenic	500	U	5.00	498	ug/L	2.75	99.3	(0%-20%)		06/23/16	09:17
Barium	500		58.8	550	ug/L	0.142	98.2	(0%-20%)		06/20/16	15:57

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1574121										
Cadmium	500	U	1.00	477	ug/L	0.878	95.5	(0%-20%)	HSC	06/20/16	15:57
Calcium	5000		47300	55000	ug/L	2.7	N/A	(0%-20%)			
Chromium	500	B	3.95	485	ug/L	0.501	96.3	(0%-20%)			
Cobalt	500	U	1.00	471	ug/L	0.707	94.3	(0%-20%)			
Copper	500	U	3.00	504	ug/L	0.521	100	(0%-20%)			
Iron	5000	U	30.0	4850	ug/L	0.686	96.9	(0%-20%)			
Magnesium	5000		11200	16700	ug/L	1.54	110	(0%-20%)			
Manganese	500	U	2.00	477	ug/L	0.562	95.3	(0%-20%)			
Nickel	500	U	1.50	468	ug/L	0.824	93.4	(0%-20%)			
Potassium	5000		8700	13600	ug/L	0.484	98	(0%-20%)		06/23/16	09:17
Silver	500	U	1.00	488	ug/L	0.358	97.6	(0%-20%)		06/20/16	15:57
Sodium	5000		28300	34600	ug/L	2.2	N/A	(0%-20%)			
Vanadium	500		14.0	510	ug/L	1.15	99.3	(0%-20%)		06/23/16	09:17
Zinc	500	U	3.30	469	ug/L	0.425	93.8	(0%-20%)		06/20/16	15:57
QC1203566366 399103001 SDILT											
Antimony		U	-2.31	DU	17.5	ug/L	N/A	(0%-10%)		06/20/16	16:00
Arsenic		U	1.48	DU	25.0	ug/L	N/A	(0%-10%)		06/23/16	09:20
Barium			58.8	D	11.7	ug/L	.529	(0%-10%)		06/20/16	16:00
Cadmium		U	-0.251	DU	5.00	ug/L	N/A	(0%-10%)			
Calcium			47300	D	9530	ug/L	.82	(0%-10%)			
Chromium		B	3.95	DU	5.00	ug/L	N/A	(0%-10%)			
Cobalt		U	-0.448	DU	5.00	ug/L	N/A	(0%-10%)			

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1574121										
Copper	U	1.99	DU	15.0	ug/L	N/A		(0%-10%)	HSC	06/20/16	16:00
Iron	U	6.15	DU	150	ug/L	N/A		(0%-10%)			
Magnesium		11200	D	2310	ug/L	2.96		(0%-10%)			
Manganese	U	0.830	DU	10.0	ug/L	N/A		(0%-10%)			
Nickel	U	0.698	DU	7.50	ug/L	N/A		(0%-10%)			
Potassium		8700	D	1720	ug/L	1.01		(0%-10%)		06/23/16	09:20
Silver	U	-0.825	DU	5.00	ug/L	N/A		(0%-10%)		06/20/16	16:00
Sodium		28300	D	5730	ug/L	1.11		(0%-10%)			
Vanadium		14.0	BD	3.03	ug/L	8.46		(0%-10%)		06/23/16	09:20
Zinc	U	-2.75	DU	16.5	ug/L	N/A		(0%-10%)		06/20/16	16:00

**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.
- 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

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QC Summary

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
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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 #: GEL399103  
Work Order #: 399103

**Product:** Alkalinity

**Analytical Method:** 2320\_ALKALINITY

**Analytical Procedure:** GL-GC-E-033 REV# 12

**Analytical Batch:** 1575207

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>
399103003	B357W9
1203569239	Method Blank (MB)
1203569240	Laboratory Control Sample (LCS)
1203569243	399103003(B357W9) 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.

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL399103 GEL Work Order: 399103

**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: 22 JUN 2016

Title: Analyst I

# Sample Data Summary

June 28, 2016

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF W16-006

Client Sample ID: B357W9
Sample ID: 399103003
Matrix: WATER
Collect Date: 07-JUN-16 12:00
Receive Date: 10-JUN-16
Collector: Client
Project: CPRCOW16006
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Row 1: 2320\_ALKALINITY: COMMON (Alkalinity only) "As Received". Row 2: Alkalinity, Total as CaCO3, 79800, 330, 1000, ug/L, 1, RXB5, 06/16/16, 2046, 1575207, 1.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 2320\_ALKALINITY.

Notes:

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 22, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1575207										
QC1203569243	399103003	DUP									
Alkalinity, Total as CaCO3		79800		78500	ug/L	1.67		(0%-20%)	RXB5	06/16/16	20:52
QC1203569240	LCS										
Alkalinity, Total as CaCO3	50000			54300	ug/L		109	(80%-120%)		06/16/16	19:24
QC1203569239	MB										
Alkalinity, Total as CaCO3			U	330	ug/L					06/16/16	19:18

**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.