

February 20, 2018

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

Re: CHPRC SAF X18-026  
Work Order: 443359  
SDG: GEL443359

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 08, 2018. 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 - 7C  
Chain of Custody: X18-026-016, X18-026-017, X18-026-018 and X18-026-019  
Enclosures



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# Case Narrative

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF X18-026  
SDG: GEL443359

February 20, 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 February 08, 2018, 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>
443359001	B3HMC4
443359002	B3HMC6
443359003	B3HMC8
443359004	B3HMD0

**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.

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

**General Chemistry**  
**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL443359**  
**Work Order #: 443359**

**Ion Chromatography**

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.

**Technical Information****Holding Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203968088 (Non SDG 443356001DUP)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968089 (B3HMD0DUP)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968090 (Non SDG 443356001PS)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968091 (B3HMD0PS)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359001 (B3HMC4)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359002 (B3HMC6)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359003 (B3HMC8)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359004 (B3HMD0)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18

**Sample Dilutions**

The following samples 1203968089 (B3HMD0DUP), 1203968091 (B3HMD0PS), 443359001 (B3HMC4), 443359002 (B3HMC6), 443359003 (B3HMC8) and 443359004 (B3HMD0) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	443359			
	001	002	003	004
Several	20X 1X	20X 10X 1X	20X 1X	20X 1X

**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**

CH2M Hill Plateau Remediation Company		C.O.C. # <b>X18-026-016</b>	
4423359		Page 1 of 1	
<b>Collector:</b> Larry Rosano CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650	
<b>SAF No.:</b> X18-026	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071	
<b>Project Title:</b> WMA A-AX, RESAMPLE, JAN 29, 20	<b>Logbook No.:</b> HNF-N-506 98/34	<b>Ice Chest No.:</b> N/A	
<b>Shipped To (Lab):</b> TestAmerica Incorporated, Rich	<b>Method of Shipment:</b> GOVERNMENT VEHICLE	<b>Bill of Lading/Air Bill No.:</b> N/A	
<b>Protocol:</b> RCRA	<b>Priority:</b> 15 Days PRIORITY	<b>Offsite Property No.:</b> N/A	
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** 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		<b>SPECIAL INSTRUCTIONS</b> N/A	
<b>Sample No.   Filter</b>	<b>Time</b>	<b>No/Type Container</b>	<b>Sample Analysis</b>
B3HMC4   N	2-5-18 0910	1x125-mL P	300.0_ANIONS_IC: COMMON
		<b>Holding Time</b>	<b>Preservative</b>
		48 Hours	COOL <=6C

67163  
W22017

<b>Relinquished By:</b> Larry Rosano Signature	<b>Signature</b>	<b>Received By:</b> Troy Bacon CHPRC Signature	<b>Signature</b>	<b>Date/Time</b>	<b>Date/Time</b>	<b>Matrix *</b>
				FEB 05 2018 1255	FEB 05 2018 1255	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
<b>Relinquished By:</b> Troy Bacon CHPRC Signature	<b>Signature</b>	<b>Received By:</b> B. Jorgenson Signature	<b>Signature</b>	<b>Date/Time</b>	<b>Date/Time</b>	DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
				FEB 05 2018 1135	2-5-18/1435	
<b>Relinquished By:</b> Troy Bacon CHPRC Signature	<b>Signature</b>	<b>Received By:</b> FED EX Signature	<b>Signature</b>	<b>Date/Time</b>	<b>Date/Time</b>	
				2-7-18/1350	FEB EX 2-7-18	
<b>Relinquished By:</b> FED EX Signature	<b>Signature</b>	<b>Received By:</b> C. Taylor Signature	<b>Signature</b>	<b>Date/Time</b>	<b>Date/Time</b>	
					2/5/18	
<b>FINAL SAMPLE DISPOSITION</b>	<b>Disposal Method (e.g., Return to customer, per lab procedure, used in process):</b>		<b>Disposed By:</b>	<b>Date/Time:</b>		

<b>CH2M Hill Plateau Remediation Company</b> C.O.C.# <b>X18-026-017</b> Page 1 of 1		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>	
Collector: <b>Larry Rescoe /CHPRC</b> X18-026	Contact/Requester: <b>Karen Waters-Husted</b> Telephone No.: <b>509-376-4650</b>	Sampling Origin: <b>Hanford Site</b> Purchase Order/Charge Code: <b>300071</b>	Ice Chest No.: <b>N/A</b> Bill of Lading/Air Bill No.: <b>N/A</b>
Project Title: <b>WMA A-AX, RESAMPLE, JAN 29, 20</b> Shipped To (Lab): <b>TestAmerica Incorporated, Rich</b>	Logbook No.: <b>HNF-N-506 98/34</b> Method of Shipment: <b>GOVERNMENT VEHICLE</b>	Priority: <b>15 Days</b> Priority: <b>PRIORITY</b> Offsite Property No.: <b>N/A</b>	Holding Time: <b>48 Hours</b> Preservative: <b>Cool &lt;=6C</b>
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** 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		<b>SPECIAL INSTRUCTIONS</b> N/A	
Sample No. <b>B3HMC6</b> Filter <b>N</b> Date <b>2-5-18</b> Time <b>1009</b>	No/Type Container <b>1x125-mL P</b> 300.0_ANIONS_IC: COMMON	Sample Analysis	

677603  
 WSC 2697

Relinquished By: <b>Larry Rescoe</b> CHPRC Print First and Last Name Signature Date/Time <b>FEB 05 2018 1255</b>	Received By: <b>Troy Bacon</b> CHPRC Print First and Last Name Signature Date/Time <b>FEB 05 2018 2226</b>	Matrix * DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By: <b>Troy Bacon</b> CHPRC Print First and Last Name Signature Date/Time <b>FEB 05 2018 1435</b>	Received By: <b>B. JOGENSEN, TARL</b> Print First and Last Name Signature Date/Time <b>2-5-18/1435</b>	SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By: <b>Larry Rescoe</b> CHPRC Print First and Last Name Signature Date/Time <b>2-7-18/1550</b>	Received By: <b>FED EX</b> Print First and Last Name Signature Date/Time <b>2-7-18</b>	Matrix * DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By: <b>FED EX</b> Print First and Last Name Signature Date/Time	Received By: <b>CHAMPLIN</b> Print First and Last Name Signature Date/Time <b>2/08/18 8845</b>	SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Disposed By:		Date/Time:
Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Date/Time:

CH2M Hill Plateau Remediation Company		C.O.C.# <b>X18-026-018</b>	
44733559		Page 1 of 1	
<b>Collector:</b> Larry Rosane CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650	
<b>SAF No.:</b> X18-026	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071	
<b>Project Title:</b> WMA A-AX, RESAMPLE, JAN 29, 20	<b>Logbook No.:</b> HNF-N-506 90/34	<b>Ice Chest No.:</b> N/A	
<b>Shipped To (Lab):</b> TestAmerica Incorporated, Rich	<b>Method of Shipment:</b> GOVERNMENT VEHICLE	<b>Bill of Lading/Air Bill No.:</b> N/A	
<b>Protocol:</b> RCRA	<b>Priority:</b> 15 Days	<b>Offsite Property No.:</b> N/A	
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** 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		<b>Sample Analysis</b>	<b>Preservative</b>
SPECIAL INSTRUCTIONS N/A		300.0_ANIONS_IC: COMMON	COOL <=6C
<b>Sample No.</b> B3HMC8	<b>Filter</b> * N	<b>Time</b> W 2-5-18 1043	<b>Holding Time</b> 48 Hours

67763  
W02697

<b>Relinquished By:</b> Larry Rosane CHPRC	<b>Signature</b>	<b>Date/Time</b> FEB 05 2018 1255	<b>Received By:</b> Troy Bacon CHPRC	<b>Signature</b>	<b>Date/Time</b> FEB 05 2018 1255
<b>Relinquished By:</b> Troy L. Baller CHPRC	<b>Signature</b>	<b>Date/Time</b> FEB 05 2018 1435	<b>Received By:</b> B. Jorgenson, TARL	<b>Signature</b>	<b>Date/Time</b> 2-5-18 1435
<b>Relinquished By:</b> Troy L. Baller	<b>Signature</b>	<b>Date/Time</b> FEB 05 2018 1550	<b>Received By:</b> Fede	<b>Signature</b>	<b>Date/Time</b> 2-7-18 1550
<b>Relinquished By:</b> Fede	<b>Signature</b>	<b>Date/Time</b>	<b>Received By:</b> Troy L. Baller	<b>Signature</b>	<b>Date/Time</b> 2-7-18 1550

<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

<b>FINAL SAMPLE DISPOSITION</b>	Disposed By:	Date/Time:
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<b>CH2M Hill Plateau Remediation Company</b> C.O.C.# <b>X18-026-019</b> Page 1 of 1		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> 443355A	
<b>Collector:</b> Larry Roane RCRC X18-026	<b>Contact/Requester:</b> Karen Waters-Husted Hanford Site	<b>Telephone No.:</b> 509-376-4650	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> WMA A-AX, RESAMPLE, JAN 29, 20	<b>Logbook No.:</b> HNF-N-506 98/34	<b>Ice Chest No.:</b> N/A	<b>Bill of Lading/Air Bill No.:</b> N/A
<b>Shipped To (Lab):</b> TestAmerica Incorporated, Rich	<b>Method of Shipment:</b> GOVERNMENT VEHICLE	<b>Offsite Property No.:</b> N/A	<b>Preservative:</b> Cool <=6C
<b>Protocol:</b> RCRA	<b>Priority:</b> 15 Days	<b>PRIORITY</b>	<b>SPECIAL INSTRUCTIONS</b> N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** 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			
<b>Sample No.</b> B3HMD0	<b>Filter</b> N	<b>Date</b> 2-5-18	<b>Time</b> 1111
<b>No/Type Container</b> 1x125-mL P	<b>Sample Analysis</b> 300.0_ANIONS_IC: COMMON	<b>Holding Time</b> 48 Hours	<b>Preservative</b> Cool <=6C

6763  
 WCL2097



300-6763 COC

<b>Relinquished By:</b> Larry Roane Signature: [Signature] Date/Time: FEB 05 2018 12:55	<b>Received By:</b> Troy Bacon Signature: [Signature] Date/Time: FEB 05 2018 12:55
<b>Relinquished By:</b> Troy Bacon Signature: [Signature] Date/Time: FEB 05 2018 1435	<b>Received By:</b> B. Jorgenson, TARL Signature: [Signature] Date/Time: 2-5-18 1435
<b>Relinquished By:</b> [Signature] Signature: [Signature] Date/Time: 2-7-18 1355	<b>Received By:</b> FEDEx Signature: [Signature] Date/Time: 2/7/18
<b>Relinquished By:</b> [Signature] Signature: [Signature] Date/Time: [Signature]	<b>Received By:</b> [Signature] Signature: [Signature] Date/Time: 2/7/18
<b>FINAL SAMPLE DISPOSITION</b>	<b>Disposal Method (e.g., Return to customer, per lab procedure, used in process):</b>

**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



# **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 20 February 2018**

<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	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	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# General Chem Analysis

# Case Narrative

**General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL443359  
Work Order #: 443359**

**Product: Ion Chromatography****Analytical Method:** 9056\_ANIONS\_IC**Analytical Procedure:** GL-GC-E-086 REV# 25**Analytical Batch:** 1737878

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>
443359001	B3HMC4
443359002	B3HMC6
443359003	B3HMC8
443359004	B3HMD0
1203968086	Method Blank (MB)
1203968087	Laboratory Control Sample (LCS)
1203968088	443356001(NonSDG) Sample Duplicate (DUP)
1203968089	443359004(B3HMD0) Sample Duplicate (DUP)
1203968090	443356001(NonSDG) Post Spike (PS)
1203968091	443359004(B3HMD0) Post Spike (PS)

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.

**Technical Information****Holding Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203968088 (Non SDG 443356001DUP)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968089 (B3HMD0DUP)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968090 (Non SDG 443356001PS)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
1203968091 (B3HMD0PS)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359001 (B3HMC4)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359002 (B3HMC6)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359003 (B3HMC8)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18
443359004 (B3HMD0)	Nitrate and Nitrite	Received 08-FEB-18, out of holding 07-FEB-18

### Sample Dilutions

The following samples 1203968089 (B3HMD0DUP), 1203968091 (B3HMD0PS), 443359001 (B3HMC4), 443359002 (B3HMC6), 443359003 (B3HMC8) and 443359004 (B3HMD0) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	443359			
	001	002	003	004
Several	20X 1X	20X 10X 1X	20X 1X	20X 1X

### 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: GEL443359 GEL Work Order: 443359

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

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.

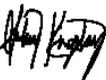
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

**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: **20 FEB 2018**

Title: **Analyst I**

# Sample Data Summary

**Certificate of Analysis**

Report Date: February 20, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF X18-026

Client Sample ID: B3HMC4	Project: CPRC0X18026
Sample ID: 443359001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-FEB-18 09:10	
Receive Date: 08-FEB-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	290	33.0	500	ug/L		1	JXH5	02/09/18	0501	1737878	1
Nitrate-N	X	2420	33.0	250	ug/L		1					
Nitrite-N	UX	33.0	33.0	250	ug/L		1					
Chloride	D	12500	1340	4000	ug/L		20	JXH5	02/10/18	0505	1737878	2
Sulfate	D	149000	2660	8000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

**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: February 20, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF X18-026

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Client Sample ID: B3HMC6	Project: CPRC0X18026
Sample ID: 443359002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-FEB-18 10:09	
Receive Date: 08-FEB-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	222	33.0	500	ug/L		1	JXH5	02/09/18	0530	1737878	1
Nitrite-N	UX	33.0	33.0	250	ug/L		1					
Chloride	D	25100	670	2000	ug/L		10	JXH5	02/09/18	1732	1737878	2
Nitrate-N	DX	7980	330	1000	ug/L		10					
Sulfate	D	233000	2660	8000	ug/L		20	JXH5	02/10/18	0534	1737878	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	
3	9056_ANIONS_IC	

**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: February 20, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF X18-026

Client Sample ID: B3HMC8	Project: CPRC0X18026
Sample ID: 443359003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-FEB-18 10:43	
Receive Date: 08-FEB-18	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	235	33.0	500	ug/L		1	JXH5	02/09/18	0559	1737878	1
Nitrite-N	UX	33.0	33.0	250	ug/L		1					
Chloride	D	31000	1340	4000	ug/L		20	JXH5	02/09/18	1801	1737878	2
Nitrate-N	DX	12200	660	2000	ug/L		20					
Sulfate	D	204000	2660	8000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

**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: February 20, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF X18-026

Client Sample ID: B3HMD0 Project: CPRC0X18026  
 Sample ID: 443359004 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-FEB-18 11:11  
 Receive Date: 08-FEB-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	245	33.0	500	ug/L		1	JXH5	02/09/18	0628	1737878	1
Nitrite-N	UX	33.0	33.0	250	ug/L		1					
Chloride	D	24400	1340	4000	ug/L		20	JXH5	02/09/18	1830	1737878	2
Nitrate-N	DX	8660	660	2000	ug/L		20					
Sulfate	D	186000	2660	8000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

**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: February 20, 2018

Page 1 of 3

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

**Contact: Mr. Scot Fitzgerald**

**Workorder: 443359**

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
<b>Ion Chromatography</b>											
Batch	1737878										
QC1203968088	443356001	DUP									
Chloride	U	67.0	U	67.0	ug/L	N/A			JXH5	02/08/18	23:44
Fluoride	U	33.0	U	33.0	ug/L	N/A					
Nitrate-N	UX	33.0	UX	33.0	ug/L	N/A					
Nitrite-N	UX	33.0	UX	33.0	ug/L	N/A					
Sulfate	U	133	U	133	ug/L	N/A					
QC1203968089	443359004	DUP									
Chloride	D	24400	D	24300	ug/L	0.263		(0%-20%)		02/09/18	19:56
Fluoride	B	245	B	238	ug/L	2.77 ^		(+/-500)		02/09/18	06:57
Nitrate-N	DX	8660	DX	8650	ug/L	0.0925		(0%-20%)		02/09/18	19:56
Nitrite-N	UX	33.0	UX	33.0	ug/L	N/A				02/09/18	06:57
Sulfate	D	186000	D	186000	ug/L	0.0237		(0%-20%)		02/09/18	19:56
QC1203968087	LCS										
Chloride		5000		4720	ug/L		94.4	(80%-120%)		02/08/18	22:46
Fluoride		2500		2490	ug/L		99.8	(80%-120%)			
Nitrate-N		2500		2390	ug/L		95.7	(80%-120%)			

**QC Summary**

Workorder: **443359**

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1737878										
Nitrite-N	2500			2430	ug/L		97.2	(80%-120%)	JXH5	02/08/18	22:46
Sulfate	10000			9740	ug/L		97.4	(80%-120%)			
QC1203968086 MB											
Chloride			U	67.0	ug/L					02/08/18	22:17
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	33.0	ug/L						
Sulfate			U	133	ug/L						
QC1203968090 443356001 PS											
Chloride	5.00	U	0.00	4.60	mg/L		92	(75%-125%)		02/09/18	00:13
Fluoride	2.50	U	0.00	2.45	mg/L		98	(75%-125%)			
Nitrate-N	2.50	UX	0.00 X	2.37	mg/L		94.7	(75%-125%)			
Nitrite-N	2.50	UX	0.00 X	2.39	mg/L		95.8	(75%-125%)			
Sulfate	10.0	U	0.00	9.44	mg/L		94.4	(75%-125%)			
QC1203968091 443359004 PS											
Chloride	5.00	D	1.22 D	5.93	mg/L		94.3	(75%-125%)		02/09/18	20:25
Fluoride	2.50	B	0.245	2.65	mg/L		96.4	(75%-125%)		02/09/18	07:26
Nitrate-N	2.50	DX	0.433 DX	2.80	mg/L		94.7	(75%-125%)		02/09/18	20:25

**QC Summary**

Workorder: 443359

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1737878										
Nitrite-N	2.50	UX	0.00	X	2.39	mg/L	95.4	(75%-125%)	JXH5	02/09/18	07:26
Sulfate	10.0	D	9.28	D	19.4	mg/L	101	(75%-125%)		02/09/18	20:25

**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.