

APRIL 3, 2018



a member of **The GEL Group** INC



REV. 0

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April 03, 2018

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

Re: CHPRC SAF W18-001  
Work Order: 445310  
SDG: GEL445310

Dear Mr. Fitzgerald:

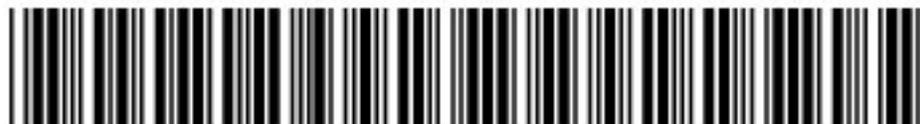
GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 07, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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 - 7H  
Chain of Custody: W18-001-105, W18-001-106, W18-001-107, W18-001-108 and W18-001-110  
Enclosures



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# Case Narrative

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF W18-001  
SDG: GEL445310**

**April 03, 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 March 07, 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>
445310001	B3FTD1
445310002	B3FVJ6
445310003	B3FVJ8
445310004	B3FVK0
445310005	B3FRL2
445310006	B3FVJ9
445310007	B3FVJ7
445310008	B3FRL3
445310009	B3FVK1
445310010	B3FTP2
445310011	B3FTP3
445310012	B3FTP1
445310013	B3FRM0
445310014	B3FTR6
445310015	B3FTR7
445310016	B3FRP1
445310017	B3FTR8
445310018	B3FRN9

**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: GC/MS Semivolatile, 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  
CH2M Hill Plateau Remediation Company (CPRC)  
SDG #: GEL445310  
Work Order #: 445310**

## **GC/MS Semivolatile**

### **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry**

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**

##### **Laboratory Control Sample (LCS) Recovery**

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1203986542 (LCS)	Several	See applicable report

## **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. 445310008 (B3FRL3), 445310013 (B3FRM0), 445310016 (B3FRP1) and 445310018 (B3FRN9).

### **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.

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

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

Sample	Analyte	Value
1204001224 (MB)	Antimony	See applicable report

**Determination of Metals by ICP-MS**

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.

**General Chemistry****Carbon, Total Organic**

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.

**Carbon, Total Organic**

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.

**Total Organic Halogens (TOX)**

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.

**Total Organic Halogens (TOX)**

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.

#### **Total Organic Halogens (TOX)**

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.

#### **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**

04/15

CH2MHill Plateau Remediation Company		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <i>445310</i>				C.O.C.# <b>W18-001-105</b>		
						Page 1 of 1		
<b>Collector:</b> <i>Larry Rosana</i> ICHPRC		<b>Contact/Requester:</b> Karen Waters-Husted			<b>Telephone No.:</b> 509-376-4650			
<b>SAF No.:</b> W18-001		<b>Sampling Origin:</b> Hanford Site			<b>Purchase Order/Charge Code:</b> 300071			
<b>Project Title:</b> RCRA, JANUARY 2018		<b>Logbook No.:</b> HNF-N-506 <i>98/50</i>			<b>Ice Chest No.:</b> <i>605-392</i>			
<b>Shipped To (Lab):</b> GEL Laboratories, LLC		<b>Method of Shipment:</b> Commercial Carrier			<b>Bill of Lading/Air Bill No.:</b> <i>77172851 1439</i>			
<b>Protocol:</b> RCRA		<b>Priority:</b> 30 Days			<b>Offsite Property No.:</b> <i>9113</i>			
<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.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FTD1	N	W	<i>3-5-18</i>	<i>1006</i>	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FTD1	N	W	↓	↓	4x1-L aG	8270_PHENOLIC_GC: COMMON	7/40 Days	Cool <=6C
B3FTD1	N	W	↓	↓	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTD1	N	W	<i>3-5-18</i>	<i>1006</i>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C

APRIL 3, 2018

Relinquished By: <i>Larry Rosana</i> ICHPRC <i>Larry Rosana</i> Print First and Last Name Signature MAR 05 2018 1310 Date/Time		Received By: <b>SSU-1</b> <i>SSU-1</i> Print First and Last Name Signature MAR 05 2018 1310 Date/Time		<b>Matrix *</b> S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: <b>SSU-1</b> <i>SSU-1</i> Print First and Last Name Signature MAR 06 2018 0730 Date/Time		Received By: <i>Larry Wall</i> ICHPRC <i>Larry Wall</i> Print First and Last Name Signature MAR 06 2018 0730 Date/Time			
Relinquished By: <i>Larry Wall</i> ICHPRC <i>Larry Wall</i> Print First and Last Name Signature MAR 06 2018 1400 Date/Time		Received By: <b>FEDEX</b> <i>FEDEX</i> Print First and Last Name Signature Date/Time			
Relinquished By: <b>Fed Ex</b> <i>Fed Ex</i> Print First and Last Name Signature Date/Time		Received By: <i>C. Garlin</i> <i>C. Garlin</i> Print First and Last Name Signature 3/7/18 0900 Date/Time			
<b>FINAL SAMPLE DISPOSITION</b>		Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

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<b>CH2MHill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">445310</span>	C.O.C.# <b>W18-001-106</b>
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<b>Collector:</b> Larry Rosane ICHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 <span style="font-size: 1.2em;">90/50</span>	<b>Ice Chest No.:</b> GWS-615
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 7717 2891 1196
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 9113

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FVJ6	N	W	3-5-18	0615	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FVJ6	N	W	↓	↓	1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FVJ8	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FVJ8	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FVK0	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FVK0	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FRL2	N	W			3-5-18	0615	1x250-mL G/P	2320_ALKALINITY: COMMON

Relinquished By: <i>Larry Rosane</i> MAR 05 2018 1310 Print First and Last Name Signature Date/Time	Received By: <b>SSU-1</b> MAR 05 2018 1310 Print First and Last Name Signature Date/Time	<b>Matrix *</b> S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Solid WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <b>SSU-1</b> MAR 06 2018 0715 Print First and Last Name Signature Date/Time	Received By: <i>Kedy Wall</i> MAR 06 2018 0715 Print First and Last Name Signature Date/Time	
Relinquished By: <i>Kedy Wall</i> MAR 06 2018 1400 Print First and Last Name Signature Date/Time	Received By: <b>FEDEX</b> Print First and Last Name Signature Date/Time	
Relinquished By: <b>Fed Ex</b> Print First and Last Name Signature Date/Time	Received By: <i>C. Arphn</i> 3/7/18 0900 Print First and Last Name Signature Date/Time	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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<b>CH2MHill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 2em; color: blue; margin-left: 100px;">445310</span>	<b>C.O.C.#</b> <b>W18-001-106</b> Page 2 of 2
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<b>Collector:</b> Larry Rosane ICHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 98/50	<b>Ice Chest No.:</b> GWS-615
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 77172851 1196
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 9113

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FRL2	N	W	3-5-18	0615	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B3FRL2	N	W	↓	↓	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FRL2	N	W	3-5-18	0615	1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C

APRIL 3, 2018

Relinquished By: <i>Larry Rosane</i> Print First and Last Name      Signature      Date/Time: MAR 05 2018 1310	Received By: <b>SSU-1</b> Print First and Last Name      Signature      Date/Time: MAR 05 2018 1310	<b>Matrix *</b> S = Soil      DS = Drum Solids SE = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By: <b>SSU-1</b> Print First and Last Name      Signature      Date/Time: MAR 06 2018 0715	Received By: <i>Larry Wall</i> Print First and Last Name      Signature      Date/Time: MAR 06 2018 0715	
Relinquished By: <i>Larry Wall</i> Print First and Last Name      Signature      Date/Time: MAR 06 2018 1400	Received By: <b>FEDEX</b> Print First and Last Name      Signature      Date/Time:	
Relinquished By: <b>Fed Ex</b> Print First and Last Name      Signature      Date/Time:	Received By: <i>C. Tarplin</i> Print First and Last Name      Signature      Date/Time: 3/7/18 0900	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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<b>CH2MHill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">445310</span>	<b>C.O.C.#</b> <b>W18-001-107</b>
Page 1 of 2		

<b>Collector:</b> Larry Rosana /CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 <span style="font-size: 1.2em;">98/50</span>	<b>Ice Chest No.:</b> <span style="font-size: 1.2em;">GWS-615</span>
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> <span style="font-size: 1.2em;">77172851196</span>
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> <span style="font-size: 1.2em;">9113</span>

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FVJ9	N	W	<span style="font-size: 1.2em;">3-5-18</span>	<span style="font-size: 1.2em;">0923</span>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FVJ7	N	W	↓	↓	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FVJ7	N	W			1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FRL3	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FRL3	N	W			1x500-mL G/P	6010_METALS ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B3FRL3	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FRL3	N	W			<span style="font-size: 1.2em;">3-5-18</span>	<span style="font-size: 1.2em;">0923</span>	1x250-mL aG	9060_TOC: COMMON

Relinquished By: <span style="font-size: 1.2em;">Larry Rosana</span> <span style="font-size: 1.2em;">MAR 05 2018 1310</span> <small>Print First and Last Name Signature Date/Time</small>	Received By: <b>SSU-1</b> <span style="font-size: 1.2em;">MAR 05 2018 1310</span> <small>Print First and Last Name Signature Date/Time</small>	<b>Matrix *</b> S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <b>SSU-1</b> <span style="font-size: 1.2em;">MAR 06 2018 0715</span> <small>Print First and Last Name Signature Date/Time</small>	Received By: <span style="font-size: 1.2em;">Kedy Wall</span> <span style="font-size: 1.2em;">MAR 06 2018 0715</span> <small>Print First and Last Name Signature Date/Time</small>	
Relinquished By: <span style="font-size: 1.2em;">Kedy Wall</span> <span style="font-size: 1.2em;">MAR 06 2018 1400</span> <small>Print First and Last Name Signature Date/Time</small>	Received By: <b>FEDEX</b> <small>Print First and Last Name Signature Date/Time</small>	
Relinquished By: <b>Fed Ex</b> <small>Print First and Last Name Signature Date/Time</small>	Received By: <span style="font-size: 1.2em;">C. Maglin</span> <span style="font-size: 1.2em;">3/7/18 0900</span> <small>Print First and Last Name Signature Date/Time</small>	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <i>NEL 3/5/18 #4 445310</i>	C.O.C.# <b>W18-001-107</b> Page 2 of 2
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<b>Collector:</b> Larry Rosane /CHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 <i>98/50</i>	<b>Ice Chest No.:</b> <i>GWS-615</i>
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> <i>771728511196</i>
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> <i>9113</i>

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FVK1	N	W	<i>3-5-18</i>	<i>0923</i>	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FVK1	N	W	<i>↓</i>	<i>↓</i>	1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FVJ9	N	W	<i>3-5-18</i>	<i>0923</i>	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C

APRIL 3, 2018

Relinquished By: <i>Larry Rosane</i> <b>MAR 05 2018 1310</b> <small>Print First and Last Name Signature Date/Time</small>	Received By: <b>SSU-1</b> <b>MAR 05 2018/1310</b> <small>Print First and Last Name Signature Date/Time</small>	<b>Matrix *</b> S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <b>SSU-1</b> <b>MAR 06 2018 0715</b> <small>Print First and Last Name Signature Date/Time</small>	Received By: <i>Kesly Wall</i> <b>MAR 06 2018 0715</b> <small>Print First and Last Name Signature Date/Time</small>	
Relinquished By: <i>Kesly Wall</i> <b>MAR 06 2018 1400</b> <small>Print First and Last Name Signature Date/Time</small>	Received By: <b>FEDEX</b> <small>Print First and Last Name Signature Date/Time</small>	
Relinquished By: <b>Fed Ex</b> <small>Print First and Last Name Signature Date/Time</small>	Received By: <i>C. Tarplin</i> <b>3/7/18 0900</b> <small>Print First and Last Name Signature Date/Time</small>	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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<b>CH2MHill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 2em; color: blue;">445310</span>	<b>C.O.C.#</b> <b>W18-001-108</b> Page 1 of 2
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<b>Collector:</b> <i>Larry Rosano</i> <small>ICHPRC</small>	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 <i>90/50</i>	<b>Ice Chest No.:</b> <i>GWS-740</i>
<b>Shipped To (Lab):</b> <u>GEL Laboratories, LLC</u>	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> <i>771728510888</i>
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> <i>9113</i>

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FTP2	N	W	<i>3-5-18</i>	<i>1045</i>	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTP2	N	W	↓	↓	1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FTP3	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTP3	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FTP1	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTP1	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FRM0	N	W			<i>3-5-18</i>	<i>1045</i>	1x250-mL G/P	2320_ALKALINITY: COMMON

Relinquished By: <i>Larry Rosano</i> <small>ICHPRC</small> Print First and Last Name      Signature      Date/Time: <b>MAR 05 2018 1310</b>	Received By: <b>SSU-1</b> Print First and Last Name      Signature      Date/Time: <b>MAR 05 2018 1310</b>	<b>Matrix *</b> S = Soil      DS = Drum Solids SE = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By: <b>SSU-1</b> Print First and Last Name      Signature      Date/Time: <b>MAR 06 2018 0715</b>	Received By: <i>Larry Wall</i> <small>ICHPRC</small> Print First and Last Name      Signature      Date/Time: <b>MAR 06 2018 0715</b>	
Relinquished By: <i>Larry Wall</i> <small>ICHPRC</small> Print First and Last Name      Signature      Date/Time: <b>MAR 06 2018 1400</b>	Received By: <b>FEDEX</b> Print First and Last Name      Signature      Date/Time:	
Relinquished By: <b>Fed Ex</b> Print First and Last Name      Signature      Date/Time:	Received By: <i>C. Tomlin</i> Print First and Last Name      Signature      Date/Time: <b>3/7/18</b>	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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APRIL 3, 2018

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<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">445310</span>	<b>C.O.C.#</b> <b>W18-001-108</b> Page 2 of 2
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<b>Collector:</b> Larry Rosano <small>ICHPRC</small>	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 <span style="color: blue;">98/50</span>	<b>Ice Chest No.:</b> <span style="color: blue;">GWS-740</span>
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> <span style="color: blue;">77172851 0886</span>
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> <span style="color: blue;">9113</span>

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

**SPECIAL INSTRUCTIONS**  
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FRM0	N	W	3-5-18	1045	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B3FRM0	N	W	↓	↓	4x1-L aG	8270_PHENOLIC_GC: COMMON	7/40 Days	Cool <=6C
B3FRM0	N	W	↓	↓	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FRM0	N	W	3-5-18	1046	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C

APRIL 3, 2018

Relinquished By: <span style="color: blue;">Larry Rosano</span> <small>ICHPRC</small> Print First and Last Name Signature Date/Time	Received By: <b>SSU-1</b> Print First and Last Name Signature Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <b>SSU-1</b> Print First and Last Name Signature Date/Time	Received By: <span style="color: blue;">Lesly Wall</span> <small>ICHPRC</small> Print First and Last Name Signature Date/Time	
Relinquished By: <span style="color: blue;">Lesly Wall</span> <small>ICHPRC</small> Print First and Last Name Signature Date/Time	Received By: <b>FEDEX</b> Print First and Last Name Signature Date/Time	
Relinquished By: <b>Fed Ex</b> Print First and Last Name Signature Date/Time	Received By: <span style="color: blue;">C. Tarplin</span> Print First and Last Name Signature Date/Time	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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REV. 0

<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">445310</span>	C.O.C.# <b>W18-001-110</b> Page 1 of 24
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<b>Collector:</b> Juan Aguilar ICHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506-9915	<b>Ice Chest No.:</b> 6005-392
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 771728511439
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 9113

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

**SPECIAL INSTRUCTIONS**  
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FTR6	N	W	3-5-18	1220	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTR6	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FTR7	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTR7	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FRP1	Y	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B3FTR8	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FTR8	N	W	3-5-18	1220	1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C

Relinquished By: Juan Aguilar ICHPRC Print First and Last Name Signature Date/Time MAR 05 2018 1250	Received By: Daniel Klug CHPRC Print First and Last Name Signature Date/Time MAR 05 2018 1250	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Daniel Klug CHPRC Print First and Last Name Signature Date/Time MAR 05 2018 1400	Received By: SSU-1 Print First and Last Name Signature Date/Time MAR 05 2018 1400	
Relinquished By: SSU-1 Print First and Last Name Signature Date/Time MAR 06 2018 0730	Received By: Lesly Wall ICHPRC Print First and Last Name Signature Date/Time MAR 06 2018 0730	
Relinquished By: Lesly Wall ICHPRC Print First and Last Name Signature Date/Time MAR 06 2018 1400	Received By: FEDEX Print First and Last Name Signature Date/Time	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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APRIL 3, 2018

REV. 0

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. 2018-001-110  
Page 2 of 4

442310

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	<b>Fed Ex</b>			C-Tarplin	<i>Chen</i>		3/7/18 0900
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

APRIL 3, 2018

<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> <span style="font-size: 1.5em; color: blue;">445310</span>	C.O.C.# <b>W18-001-110</b>
		Page <span style="font-size: 1.5em;">3</span> of <span style="font-size: 1.5em;">23</span>

<b>Collector:</b> Juan Aguilar ICHPRC	<b>Contact/Requester:</b> Karen Waters-Husted	<b>Telephone No.:</b> 509-376-4650
<b>SAF No.:</b> W18-001	<b>Sampling Origin:</b> Hanford Site	<b>Purchase Order/Charge Code:</b> 300071
<b>Project Title:</b> RCRA, JANUARY 2018	<b>Logbook No.:</b> HNF-N-506 - 9915	<b>Ice Chest No.:</b> 605-392
<b>Shipped To (Lab):</b> GEL Laboratories, LLC	<b>Method of Shipment:</b> Commercial Carrier	<b>Bill of Lading/Air Bill No.:</b> 7717 2851 1439
<b>Protocol:</b> RCRA	<b>Priority:</b> 30 Days	<b>Offsite Property No.:</b> 9113

<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
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FRN9	N	W	3-5-18	1220	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3FRN9	N	W	↓	↓	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2 / Cool <=6C
B3FRN9	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3FRN9	N	W	3-5-18	1220	1x500-mL G/P	6010_METALS_ICP: COMMON; 6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2

APRIL 3, 2018

Relinquished By: Juan Aguilar ICHPRC Print First and Last Name      Signature      Date/Time: MAR 05 2018 1250	Received By: Daniel Klug CHPRC Print First and Last Name      Signature      Date/Time: MAR 05 2018 1250	<b>Matrix *</b> S = Soil      DS = Drum Solids SE = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By: Daniel Klug CHPRC Print First and Last Name      Signature      Date/Time: MAR 05 2018 1400	Received By: SSU-1 Print First and Last Name      Signature      Date/Time: MAR 05 2018 1400	
Relinquished By: SSU-1 Print First and Last Name      Signature      Date/Time: MAR 06 2018 0730	Received By: Ledy Wall ICHPRC Print First and Last Name      Signature      Date/Time: MAR 06 2018 0730	
Relinquished By: Ledy Wall ICHPRC Print First and Last Name      Signature      Date/Time: MAR 06 2018 1400	Received By: FEDEX Print First and Last Name      Signature      Date/Time:	

<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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### CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W18-001-110  
Page 4 of 4

445310

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	<b>Fed Ex</b>			<i>C. Tamplin</i>		<i>[Signature]</i>	<u>3/7/18 0900</u>
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

APRIL 3, 2018



# **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 03 April 2018**

<b>State</b>	<b>Certification</b>
Alaska	17-018
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 Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122018-26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Semi-Volatile Analysis**

# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
CH2M Hill Plateau Remediation Company (CPRC)  
SDG #: GEL445310  
Work Order #: 445310**

**Product:** Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

**Analytical Method:** SW846 3510C/8270D

**Analytical Procedure:** GL-OA-E-009 REV# 40

**Analytical Batch:** 1745680

**Preparation Method:** SW846 3510C

**Preparation Procedure:** GL-OA-E-013 REV# 32

**Preparation Batch:** 1745679

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>
445310001	B3FTD1
445310013	B3FRM0
1203986541	Method Blank (MB)
1203986542	Laboratory Control Sample (LCS)
1203986543	445476002(NonSDG) Matrix Spike (MS)
1203986544	445476002(NonSDG) 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.

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1203986542 (LCS)	Several	See applicable report

**Certification Statement**

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL445310 GEL Work Order: 445310

**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.

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: **Barbara Bailey**

Date: **29 MAR 2018**

Title: **Data Validator**

# Sample Data Summary

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> GEL445310	<b>Date Collected:</b> 03/05/2018 10:06	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 445310001	<b>Date Received:</b> 03/07/2018 09:00	
<b>Client ID:</b> B3FTD1	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0W18001
<b>Batch ID:</b> 1745680	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Run Date:</b> 03/09/2018 14:49	<b>Inst:</b> MSDA.I	<b>Dilution:</b> 1
<b>Prep Date:</b> 03/09/2018 08:09	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 030918a.s\Ac0914.D	<b>Aliquot:</b> 1050 mL	<b>Final Volume:</b> 1 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	U	2.86	ug/L	2.86	9.52
95-95-4	2,4,5-Trichlorophenol	U	2.86	ug/L	2.86	9.52
88-06-2	2,4,6-Trichlorophenol	U	2.86	ug/L	2.86	9.52
120-83-2	2,4-Dichlorophenol	U	2.86	ug/L	2.86	9.52
105-67-9	2,4-Dimethylphenol	U	2.86	ug/L	2.86	9.52
51-28-5	2,4-Dinitrophenol	U	4.76	ug/L	4.76	19.0
87-65-0	2,6-Dichlorophenol	U	2.86	ug/L	2.86	9.52
95-57-8	2-Chlorophenol	U	2.86	ug/L	2.86	9.52
534-52-1	2-Methyl-4,6-dinitrophenol	U	2.86	ug/L	2.86	9.52
88-75-5	2-Nitrophenol	U	2.86	ug/L	2.86	9.52
59-50-7	4-Chloro-3-methylphenol	U	2.86	ug/L	2.86	9.52
100-02-7	4-Nitrophenol	U	2.86	ug/L	2.86	9.52
88-85-7	Dinoseb	U	2.86	ug/L	2.86	9.52
87-86-5	Pentachlorophenol	U	2.86	ug/L	2.86	9.52
108-95-2	Phenol	U	2.86	ug/L	2.86	9.52
65794-96-9	m,p-Cresols	U	3.52	ug/L	3.52	9.52
95-48-7	o-Cresol	U	2.86	ug/L	2.86	9.52

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> GEL445310	<b>Date Collected:</b> 03/05/2018 10:45	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 445310013	<b>Date Received:</b> 03/07/2018 09:00	
<b>Client ID:</b> B3FRM0	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0W18001
<b>Batch ID:</b> 1745680	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Run Date:</b> 03/09/2018 15:16	<b>Inst:</b> MSDA.I	<b>Dilution:</b> 1
<b>Prep Date:</b> 03/09/2018 08:09	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 030918a.s\Ac0915.D	<b>Aliquot:</b> 1030 mL	<b>Final Volume:</b> 1 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	U	2.91	ug/L	2.91	9.71
95-95-4	2,4,5-Trichlorophenol	U	2.91	ug/L	2.91	9.71
88-06-2	2,4,6-Trichlorophenol	U	2.91	ug/L	2.91	9.71
120-83-2	2,4-Dichlorophenol	U	2.91	ug/L	2.91	9.71
105-67-9	2,4-Dimethylphenol	U	2.91	ug/L	2.91	9.71
51-28-5	2,4-Dinitrophenol	U	4.85	ug/L	4.85	19.4
87-65-0	2,6-Dichlorophenol	U	2.91	ug/L	2.91	9.71
95-57-8	2-Chlorophenol	U	2.91	ug/L	2.91	9.71
534-52-1	2-Methyl-4,6-dinitrophenol	U	2.91	ug/L	2.91	9.71
88-75-5	2-Nitrophenol	U	2.91	ug/L	2.91	9.71
59-50-7	4-Chloro-3-methylphenol	U	2.91	ug/L	2.91	9.71
100-02-7	4-Nitrophenol	U	2.91	ug/L	2.91	9.71
88-85-7	Dinoseb	U	2.91	ug/L	2.91	9.71
87-86-5	Pentachlorophenol	U	2.91	ug/L	2.91	9.71
108-95-2	Phenol	U	2.91	ug/L	2.91	9.71
65794-96-9	m,p-Cresols	U	3.59	ug/L	3.59	9.71
95-48-7	o-Cresol	U	2.91	ug/L	2.91	9.71

# Quality Control Summary

**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: March 12, 2018

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445310

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>										
Batch	1745680									
QC1203986542	LCS									
2,3,4,6-Tetrachlorophenol	50.0		40.1	ug/L		80	(70%-130%)	JMB3	03/09/18	13:54
2,4,5-Trichlorophenol	50.0		39.2	ug/L		78	(70%-130%)			
2,4,6-Trichlorophenol	50.0		37.8	ug/L		76	(70%-130%)			
2,4-Dichlorophenol	50.0		38.4	ug/L		77	(70%-130%)			
2,4-Dimethylphenol	50.0		34.3	ug/L		69*	(70%-130%)			
2,4-Dinitrophenol	50.0		47.3	ug/L		95	(70%-130%)			
2,6-Dichlorophenol	50.0		43.9	ug/L		88	(70%-130%)			
2-Chlorophenol	50.0		36.7	ug/L		73	(70%-130%)			
2-Methyl-4,6-dinitrophenol	50.0		43.4	ug/L		87	(70%-130%)			
2-Nitrophenol	50.0		38.0	ug/L		76	(70%-130%)			
4-Chloro-3-methylphenol	50.0		39.2	ug/L		78	(70%-130%)			
4-Nitrophenol	50.0		13.2	ug/L		26*	(70%-130%)			
Pentachlorophenol	50.0		48.3	ug/L		97	(70%-130%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1745680										
Phenol	50.0			14.9	ug/L		30*	(70%-130%)	JMB3	03/09/18	13:54
m,p-Cresols	50.0			34.2	ug/L		68*	(70%-130%)			
o-Cresol	50.0			33.4	ug/L		67*	(70%-130%)			
**2,4,6-Tribromophenol	100			86.9	ug/L		87	(32%-124%)			
**2-Fluorobiphenyl	50.0			33.7	ug/L		67	(32%-112%)			
**2-Fluorophenol	100			47.9	ug/L		48	(15%-88%)			
**Nitrobenzene-d5	50.0			39.3	ug/L		79	(36%-115%)			
**Phenol-d5	100			30.1	ug/L		30	(15%-91%)			
**p-Terphenyl-d14	50.0			44.5	ug/L		89	(36%-121%)			
QC1203986541 MB											
2,3,4,6-Tetrachlorophenol			U	3.00	ug/L					03/09/18	13:27
2,4,5-Trichlorophenol			U	3.00	ug/L						
2,4,6-Trichlorophenol			U	3.00	ug/L						
2,4-Dichlorophenol			U	3.00	ug/L						
2,4-Dimethylphenol			U	3.00	ug/L						
2,4-Dinitrophenol			U	5.00	ug/L						

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1745680										
2,6-Dichlorophenol			U	3.00	ug/L				JMB3	03/09/18	13:27
2-Chlorophenol			U	3.00	ug/L						
2-Methyl-4,6-dinitrophenol			U	3.00	ug/L						
2-Nitrophenol			U	3.00	ug/L						
4-Chloro-3-methylphenol			U	3.00	ug/L						
4-Nitrophenol			U	3.00	ug/L						
Dinoseb			U	3.00	ug/L						
Pentachlorophenol			U	3.00	ug/L						
Phenol			U	3.00	ug/L						
m,p-Cresols			U	3.70	ug/L						
o-Cresol			U	3.00	ug/L						
**2,4,6-Tribromophenol	100			66.8	ug/L		67	(32%-124%)			
**2-Fluorobiphenyl	50.0			31.0	ug/L		62	(32%-112%)			
**2-Fluorophenol	100			43.7	ug/L		44	(15%-88%)			
**Nitrobenzene-d5	50.0			34.4	ug/L		69	(36%-115%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1745680										
**Phenol-d5	100			26.3	ug/L		26	(15%-91%)	JMB3	03/09/18	13:27
**p-Terphenyl-d14	50.0			37.8	ug/L		76	(36%-121%)			
QC1203986543 445476002 MS											
2,3,4,6-Tetrachlorophenol	116	U	3.00	77.3	ug/L		67	(29%-127%)		03/09/18	17:59
2,4,5-Trichlorophenol	116	U	3.00	76.5	ug/L		66	(32%-124%)			
2,4,6-Trichlorophenol	116	U	3.00	73.3	ug/L		63	(33%-124%)			
2,4-Dichlorophenol	116	U	3.00	73.7	ug/L		63	(31%-121%)			
2,4-Dimethylphenol	116	U	3.00	65.8	ug/L		57	(28%-112%)			
2,4-Dinitrophenol	116	U	5.00	84.9	ug/L		73	(15%-140%)			
2,6-Dichlorophenol	116	U	3.00	83.8	ug/L		72	(32%-127%)			
2-Chlorophenol	116	U	3.00	72.4	ug/L		62	(27%-116%)			
2-Methyl-4,6-dinitrophenol	116	U	3.00	79.4	ug/L		68	(15%-142%)			
2-Nitrophenol	116	U	3.00	73.5	ug/L		63	(35%-121%)			
4-Chloro-3-methylphenol	116	U	3.00	77.9	ug/L		67	(28%-130%)			
4-Nitrophenol	116	U	3.00	56.7	ug/L		49	(15%-88%)			
Pentachlorophenol	116	U	3.00	89.2	ug/L		77	(15%-135%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1745680										
Phenol	116	U	3.00	50.5	ug/L		43	(15%-80%)	JMB3	03/09/18	17:59
m,p-Cresols	116	U	3.70	80.3	ug/L		69	(31%-118%)			
o-Cresol	116	U	3.00	73.0	ug/L		63	(32%-108%)			
**2,4,6-Tribromophenol	233		35.0	159	ug/L		68	(32%-124%)			
**2-Fluorobiphenyl	116		29.4	69.9	ug/L		60	(32%-112%)			
**2-Fluorophenol	233		29.2	124	ug/L		53	(15%-88%)			
**Nitrobenzene-d5	116		31.8	72.9	ug/L		63	(36%-115%)			
**Phenol-d5	233		19.2	99.0	ug/L		43	(15%-91%)			
**p-Terphenyl-d14	116		38.3	75.3	ug/L		65	(36%-121%)			
QC1203986544 445476002 MSD											
2,3,4,6-Tetrachlorophenol	116	U	3.00	86.1	ug/L	11	74	(0%-20%)		03/09/18	18:26
2,4,5-Trichlorophenol	116	U	3.00	84.6	ug/L	10	73	(0%-20%)			
2,4,6-Trichlorophenol	116	U	3.00	82.7	ug/L	12	71	(0%-20%)			
2,4-Dichlorophenol	116	U	3.00	84.7	ug/L	14	73	(0%-20%)			
2,4-Dimethylphenol	116	U	3.00	73.6	ug/L	11	63	(0%-20%)			
2,4-Dinitrophenol	116	U	5.00	92.4	ug/L	9	80	(0%-20%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1745680										
2,6-Dichlorophenol	116	U	3.00	95.4	ug/L	13	82	(0%-20%)	JMB3	03/09/18	18:26
2-Chlorophenol	116	U	3.00	81.7	ug/L	12	70	(0%-20%)			
2-Methyl-4,6-dinitrophenol	116	U	3.00	87.0	ug/L	9	75	(0%-20%)			
2-Nitrophenol	116	U	3.00	85.5	ug/L	15	74	(0%-20%)			
4-Chloro-3-methylphenol	116	U	3.00	85.8	ug/L	10	74	(0%-20%)			
4-Nitrophenol	116	U	3.00	56.7	ug/L	0	49	(0%-20%)			
Pentachlorophenol	116	U	3.00	98.6	ug/L	10	85	(0%-20%)			
Phenol	116	U	3.00	55.2	ug/L	9	47	(0%-20%)			
m,p-Cresols	116	U	3.70	88.3	ug/L	10	76	(0%-20%)			
o-Cresol	116	U	3.00	80.5	ug/L	10	69	(0%-20%)			
**2,4,6-Tribromophenol	233		35.0	174	ug/L		75	(32%-124%)			
**2-Fluorobiphenyl	116		29.4	77.9	ug/L		67	(32%-112%)			
**2-Fluorophenol	233		29.2	139	ug/L		60	(15%-88%)			
**Nitrobenzene-d5	116		31.8	83.5	ug/L		72	(36%-115%)			
**Phenol-d5	233		19.2	108	ug/L		47	(15%-91%)			

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**QC Summary**

Workorder: 445310

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1745680										
**p-Terphenyl-d14	116	38.3		84.0	ug/L		72	(36%-121%)	JMB3	03/09/18	18:26

**Notes:**

The Qualifiers in this report are defined as follows:

- 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.

Semi-Volatile  
Surrogate Recovery Report

SDG Number: GEL445310

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203986541	MB for batch 1745679	44	26	69	62	67	76
1203986542	LCS for batch 1745679	48	30	79	67	87	89
445310001	B3FTD1	39	23	65	65	67	81
445310013	B3FRM0	29	16	60	59	62	66
1203986543	CAAN-18-151444MS	53	43	63	60	68	65
1203986544	CAAN-18-151444MSD	60	47	72	67	75	72

**Surrogate****Acceptance Limits**

2FP	= 2-Fluorophenol	(15%-88%)
PHL	= Phenol-d5	(15%-91%)
NBZ	= Nitrobenzene-d5	(36%-115%)
FBP	= 2-Fluorobiphenyl	(32%-112%)
TBP	= 2,4,6-Tribromophenol	(32%-124%)
TPH	= p-Terphenyl-d14	(36%-121%)

\* 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 #: GEL445310**  
**Work Order #: 445310**

**Product: Determination of Metals by ICP****Analytical Method:** SW846 3005A/6010D**Analytical Procedure:** GL-MA-E-013 REV# 30**Analytical Batches:** 1745005 and 1752262**Product: Determination of Metals by ICP-MS****Analytical Method:** SW846 3005A/6020B**Analytical Procedure:** GL-MA-E-014 REV# 32**Analytical Batch:** 1745000**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batches:** 1744998, 1745004 and 1752261

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>
445310005	B3FRL2
445310008	B3FRL3
445310013	B3FRM0
445310016	B3FRP1
445310018	B3FRN9
1203985122	Method Blank (MB)ICP
1204001224	Method Blank (MB)ICP
1203985123	Laboratory Control Sample (LCS)
1204001225	Laboratory Control Sample (LCS)
1203985126	445310005(B3FRL2L) Serial Dilution (SD)
1203985124	445310005(B3FRL2S) Matrix Spike (MS)
1203985125	445310005(B3FRL2SD) Matrix Spike Duplicate (MSD)
1203985114	Method Blank (MB)ICP-MS
1203985115	Laboratory Control Sample (LCS)
1203985118	445372001(NonSDGL) Serial Dilution (SD)
1203985116	445372001(NonSDGS) Matrix Spike (MS)
1203985117	445372001(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. 445310008 (B3FRL3), 445310013 (B3FRM0), 445310016 (B3FRP1) and 445310018 (B3FRN9)-ICP.

**ICSA/ICSAB Statement**

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

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

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

Sample	Analyte	Value
1204001224 (MB)	Antimony	See applicable report

**Certification Statement**

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

**GEL LABORATORIES LLC**

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**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL445310 GEL Work Order: 445310

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

\* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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

**Review/Validation**

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

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

**Signature:****Name: Jamie Johnson****Date: 03 APR 2018****Title: Group Leader**

# Sample Data Summary

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

SDG No: GEL445310

CONTRACT: CPRCOW18001

METHOD TYPE: SW846

SAMPLE ID:445310005

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3FRL2

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	04/03/18 11:29	040318-1	1752262
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-39-3	Barium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-47-3	Chromium	1	ug/L	U	1	5	5	1	P	HSC	04/03/18 11:29	040318-1	1752262
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	04/03/18 11:29	040318-1	1752262
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 14:37	032318-2	1745005
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	HSC	03/23/18 14:37	032318-2	1745005
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	04/03/18 11:29	040318-1	1752262
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	04/03/18 11:29	040318-1	1752262
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	TXT1	03/30/18 13:30	033018-3	1745005
7440-22-4	Silver	1.04	ug/L	B	1	5	5	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	HSC	03/23/18 14:37	032318-2	1745005
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	15	1	MS	BAJ	03/19/18 19:25	180319-4	1745000
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	HSC	04/03/18 11:29	040318-1	1752262
7440-66-6	Zinc	3.9	ug/L	B	3.3	10	10	1	P	HSC	04/03/18 11:29	040318-1	1752262

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1752262	1752261	SW846 3005A	50	mL	50	mL	04/02/18	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

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

SDG No: GEL445310

CONTRACT: CPRCOW18001

METHOD TYPE: SW846

SAMPLE ID:445310008

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3FRL3

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	04/03/18 11:42	040318-1	1752262
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-39-3	Barium	59.7	ug/L		1	5	5	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-70-2	Calcium	55300	ug/L		50	200	200	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-47-3	Chromium	5.61	ug/L		1	5	5	1	P	HSC	04/03/18 11:42	040318-1	1752262
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	04/03/18 11:42	040318-1	1752262
7439-89-6	Iron	34	ug/L	B	30	100	100	1	P	HSC	03/23/18 14:47	032318-2	1745005
7439-95-4	Magnesium	17700	ug/L		110	300	300	1	P	HSC	03/23/18 14:47	032318-2	1745005
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	04/03/18 11:42	040318-1	1752262
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	04/03/18 11:42	040318-1	1752262
7440-09-7	Potassium	4320	ug/L		50	150	150	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-23-5	Sodium	15800	ug/L		100	300	300	1	P	HSC	03/23/18 14:47	032318-2	1745005
7440-61-1	Uranium	1.11	ug/L		0.067	0.2	15	1	MS	BAJ	03/19/18 19:28	180319-4	1745000
7440-62-2	Vanadium	23.9	ug/L		1	5	5	1	P	HSC	04/03/18 11:42	040318-1	1752262
7440-66-6	Zinc	9.74	ug/L	B	3.3	10	10	1	P	HSC	04/03/18 11:42	040318-1	1752262

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1752262	1752261	SW846 3005A	50	mL	50	mL	04/02/18	JXM8

**\*Analytical Methods:**

**P** SW846 3005A/6010D  
**MS** SW846 3005A/6020B

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

SDG No: GEL445310

CONTRACT: CPRCOW18001

METHOD TYPE: SW846

SAMPLE ID:445310013

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3FRM0

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	04/03/18 11:45	040318-1	1752262
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-39-3	Barium	58.3	ug/L		1	5	5	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-70-2	Calcium	52300	ug/L		50	200	200	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-47-3	Chromium	5.72	ug/L		1	5	5	1	P	HSC	04/03/18 11:45	040318-1	1752262
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	04/03/18 11:45	040318-1	1752262
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 14:50	032318-2	1745005
7439-95-4	Magnesium	16400	ug/L		110	300	300	1	P	HSC	03/23/18 14:50	032318-2	1745005
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	04/03/18 11:45	040318-1	1752262
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	04/03/18 11:45	040318-1	1752262
7440-09-7	Potassium	4430	ug/L		50	150	150	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-23-5	Sodium	24800	ug/L		100	300	300	1	P	HSC	03/23/18 14:50	032318-2	1745005
7440-61-1	Uranium	1.15	ug/L		0.067	0.2	15	1	MS	BAJ	03/19/18 19:31	180319-4	1745000
7440-62-2	Vanadium	24.1	ug/L		1	5	5	1	P	HSC	04/03/18 11:45	040318-1	1752262
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	04/03/18 11:45	040318-1	1752262

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1752262	1752261	SW846 3005A	50	mL	50	mL	04/02/18	JXM8

**\*Analytical Methods:**

**P** SW846 3005A/6010D  
**MS** SW846 3005A/6020B

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

SDG No: GEL445310

CONTRACT: CPRCOW18001

METHOD TYPE: SW846

SAMPLE ID: 445310016

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3FRP1

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	04/03/18 11:48	040318-1	1752262
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-39-3	Barium	48.7	ug/L		1	5	5	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-70-2	Calcium	42500	ug/L		50	200	200	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-47-3	Chromium	5.73	ug/L		1	5	5	1	P	HSC	04/03/18 11:48	040318-1	1752262
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	04/03/18 11:48	040318-1	1752262
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/23/18 14:53	032318-2	1745005
7439-95-4	Magnesium	14100	ug/L		110	300	300	1	P	HSC	03/23/18 14:53	032318-2	1745005
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	04/03/18 11:48	040318-1	1752262
7440-02-0	Nickel	1.5	ug/L	U	1.5	5	5	1	P	HSC	04/03/18 11:48	040318-1	1752262
7440-09-7	Potassium	4060	ug/L		50	150	150	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-22-4	Silver	1.08	ug/L	B	1	5	5	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-23-5	Sodium	19000	ug/L		100	300	300	1	P	HSC	03/23/18 14:53	032318-2	1745005
7440-62-2	Vanadium	23.2	ug/L		1	5	5	1	P	HSC	04/03/18 11:48	040318-1	1752262
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	04/03/18 11:48	040318-1	1752262

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1752262	1752261	SW846 3005A	50	mL	50	mL	04/02/18	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

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

SDG No: GEL445310

CONTRACT: CPRCOW18001

METHOD TYPE: SW846

SAMPLE ID:445310018

BASIS: As Received

DATE COLLECTED 05-MAR-18

CLIENT ID: B3FRN9

LEVEL: Low

DATE RECEIVED 07-MAR-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	04/03/18 11:51	040318-1	1752262
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-39-3	Barium	47.6	ug/L		1	5	5	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-70-2	Calcium	41600	ug/L		50	200	200	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-47-3	Chromium	5.99	ug/L		1	5	5	1	P	HSC	04/03/18 11:51	040318-1	1752262
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	04/03/18 11:51	040318-1	1752262
7439-89-6	Iron	68.9	ug/L	B	30	100	100	1	P	HSC	03/23/18 15:01	032318-2	1745005
7439-95-4	Magnesium	13900	ug/L		110	300	300	1	P	HSC	03/23/18 15:01	032318-2	1745005
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	04/03/18 11:51	040318-1	1752262
7440-02-0	Nickel	1.56	ug/L	B	1.5	5	5	1	P	HSC	04/03/18 11:51	040318-1	1752262
7440-09-7	Potassium	3910	ug/L		50	150	150	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-22-4	Silver	1.37	ug/L	B	1	5	5	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-23-5	Sodium	18500	ug/L		100	300	300	1	P	HSC	03/23/18 15:01	032318-2	1745005
7440-61-1	Uranium	2.71	ug/L		0.067	0.2	15	1	MS	BAJ	03/19/18 19:34	180319-4	1745000
7440-62-2	Vanadium	24.3	ug/L		1	5	5	1	P	HSC	04/03/18 11:51	040318-1	1752262
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	04/03/18 11:51	040318-1	1752262

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1745000	1744998	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1745005	1745004	SW846 3005A	50	mL	50	mL	03/07/18	JXM8
1752262	1752261	SW846 3005A	50	mL	50	mL	04/02/18	JXM8

**\*Analytical Methods:**

P SW846 3005A/6010D

MS SW846 3005A/6020B

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: April 3, 2018

Page 1 of 8

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445310

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis - ICPMS</b>											
Batch	1745000										
QC1203985115		LCS									
Uranium	50.0			46.6	ug/L		93.3	(80%-120%)	BAJ	03/19/18	19:18
QC1203985114		MB									
Uranium			U	0.067	ug/L					03/19/18	19:15
QC1203985116		445372001	MS								
Uranium	50.0		2.26	49.3	ug/L		94	(75%-125%)		03/19/18	19:48
QC1203985117		445372001	MSD								
Uranium	50.0		2.26	48.5	ug/L	1.6	92.4	(0%-20%)		03/19/18	19:51
QC1203985118		445372001	SDILT								
Uranium			2.26	D	0.451	ug/L	.0443	(0%-20%)		03/19/18	19:58

<b>Metals Analysis-ICP</b>											
Batch	1745005										
QC1203985123		LCS									
Arsenic	500			469	ug/L		93.7	(80%-120%)	HSC	03/23/18	14:35
Barium	500			474	ug/L		94.9	(80%-120%)			
Cadmium	500			467	ug/L		93.5	(80%-120%)			
Calcium	5000			4810	ug/L		96.3	(80%-120%)			
Cobalt	500			472	ug/L		94.4	(80%-120%)			
Iron	5000			4760	ug/L		95.3	(80%-120%)			

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 445310

Page 2 of 8

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1745005										
Magnesium	5000			4760	ug/L		95.2	(80%-120%)	HSC	03/23/18	14:35
Potassium	5000			4470	ug/L		89.4	(80%-120%)			
Silver	500			478	ug/L		95.6	(80%-120%)			
Sodium	5000			4550	ug/L		90.9	(80%-120%)			
QC1203985122	MB										
Arsenic			U	5.00	ug/L					03/23/18	14:32
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L						
Calcium			U	50.0	ug/L						
Cobalt			U	1.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			U	100	ug/L						
QC1203985124	445310005 MS										
Arsenic	500	U	5.00	471	ug/L		94	(75%-125%)		03/23/18	14:40

**GEL LABORATORIES LLC**

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1745005										
Barium	500	U	1.00	478	ug/L		95.5	(75%-125%)	HSC	03/23/18	14:40
Cadmium	500	U	1.00	470	ug/L		94	(75%-125%)			
Calcium	5000	U	50.0	4920	ug/L		98	(75%-125%)			
Cobalt	500	U	1.00	478	ug/L		95.6	(75%-125%)			
Iron	5000	U	30.0	4850	ug/L		96.8	(75%-125%)			
Magnesium	5000	U	110	4890	ug/L		97.8	(75%-125%)			
Potassium	5000	U	50.0	4790	ug/L		95.7	(75%-125%)	TXT1	03/30/18	13:32
Silver	500	B	1.04	481	ug/L		96	(75%-125%)	HSC	03/23/18	14:40
Sodium	5000	U	100	4680	ug/L		93.1	(75%-125%)			
QC1203985125 445310005 MSD											
Arsenic	500	U	5.00	474	ug/L	0.732	94.7	(0%-20%)		03/23/18	14:42
Barium	500	U	1.00	480	ug/L	0.493	96	(0%-20%)			
Cadmium	500	U	1.00	472	ug/L	0.448	94.4	(0%-20%)			
Calcium	5000	U	50.0	4990	ug/L	1.41	99.4	(0%-20%)			
Cobalt	500	U	1.00	480	ug/L	0.353	96	(0%-20%)			
Iron	5000	U	30.0	4880	ug/L	0.479	97.3	(0%-20%)			

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 445310

Page 4 of 8

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1745005										
Magnesium	5000	U	110	4920	ug/L	0.538	98.3	(0%-20%)	HSC	03/23/18	14:42
Potassium	5000	U	50.0	4830	ug/L	0.849	96.6	(0%-20%)	TXT1	03/30/18	13:35
Silver	500	B	1.04	484	ug/L	0.727	96.7	(0%-20%)	HSC	03/23/18	14:42
Sodium	5000	U	100	4740	ug/L	1.3	94.4	(0%-20%)			
QC1203985126	445310005 SDILT										
Arsenic		U	0.455 DU	25.0	ug/L	N/A		(0%-20%)		03/23/18	14:44
Barium		U	0.213 DU	5.00	ug/L	N/A		(0%-20%)			
Cadmium		U	0.188 DU	5.00	ug/L	N/A		(0%-20%)			
Calcium		U	17.9 DU	250	ug/L	N/A		(0%-20%)			
Cobalt		U	0.106 DU	5.00	ug/L	N/A		(0%-20%)			
Iron		U	12.6 DU	150	ug/L	N/A		(0%-20%)			
Magnesium		U	3.18 DU	550	ug/L	N/A		(0%-20%)			
Potassium		U	-35.4 DU	250	ug/L	N/A		(0%-20%)	TXT1	03/30/18	13:37
Silver		B	1.04 DU	5.00	ug/L	N/A		(0%-20%)	HSC	03/23/18	14:44
Sodium		U	25.6 DU	500	ug/L	N/A		(0%-20%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1752262										
QC1204001225	LCS										
Antimony	500			476	ug/L		95.2	(80%-120%)	HSC	04/03/18	11:26
Chromium	500			479	ug/L		95.9	(80%-120%)			
Copper	500			493	ug/L		98.7	(80%-120%)			
Manganese	500			494	ug/L		98.7	(80%-120%)			
Nickel	500			482	ug/L		96.4	(80%-120%)			
Vanadium	500			494	ug/L		98.8	(80%-120%)			
Zinc	500			451	ug/L		90.2	(80%-120%)			
QC1204001224	MB										
Antimony			B	-4.37	ug/L					04/03/18	11:23
Chromium			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						

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**QC Summary**

Workorder: 445310

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch 1752262											
QC1203985124 445310005 MS											
Antimony	500	B	-7.51	470	ug/L		94	(75%-125%)	HSC	04/03/18	11:32
Chromium	500	U	1.00	476	ug/L		94.9	(75%-125%)			
Copper	500	U	3.00	490	ug/L		98	(75%-125%)			
Manganese	500	U	2.00	489	ug/L		97.7	(75%-125%)			
Nickel	500	U	1.50	478	ug/L		95.5	(75%-125%)			
Vanadium	500	U	1.00	490	ug/L		97.9	(75%-125%)			
Zinc	500	B	3.90	447	ug/L		88.7	(75%-125%)			
QC1203985125 445310005 MSD											
Antimony	500	B	-7.51	472	ug/L	0.454	94.5	(0%-20%)		04/03/18	11:35
Chromium	500	U	1.00	475	ug/L	0.0358	94.9	(0%-20%)			
Copper	500	U	3.00	491	ug/L	0.251	98.2	(0%-20%)			
Manganese	500	U	2.00	489	ug/L	0.184	97.9	(0%-20%)			
Nickel	500	U	1.50	478	ug/L	0.0209	95.4	(0%-20%)			
Vanadium	500	U	1.00	490	ug/L	0.118	98	(0%-20%)			
Zinc	500	B	3.90	447	ug/L	0.0112	88.7	(0%-20%)			

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1752262										
	QC1203985126 445310005 SDILT										
Antimony	B	-7.51	DU	17.5	ug/L	N/A		(0%-20%)	HSC	04/03/18	11:39
Chromium	U	0.815	DU	5.00	ug/L	N/A		(0%-20%)			
Copper	U	-0.0764	DU	15.0	ug/L	N/A		(0%-20%)			
Manganese	U	0.0666	DU	10.0	ug/L	N/A		(0%-20%)			
Nickel	U	0.687	DU	7.50	ug/L	N/A		(0%-20%)			
Vanadium	U	0.309	DU	5.00	ug/L	N/A		(0%-20%)			
Zinc	B	3.90	BD	4.58	ug/L	488		(0%-20%)			

**Notes:**

The Qualifiers in this report are defined as follows:

- \* Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- 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: 445310

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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 #: GEL445310  
Work Order #: 445310**

**Product: Carbon, Total Organic****Analytical Method:** SW846 9060A**Analytical Procedure:** GL-GC-E-093 REV# 15**Analytical Batches:** 1744949 and 1744969

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>
445310001	B3FTD1
445310002	B3FVJ6
445310003	B3FVJ8
445310004	B3FVK0
445310005	B3FRL2
445310006	B3FVJ9
445310007	B3FVJ7
445310008	B3FRL3
445310009	B3FVK1
445310010	B3FTP2
445310011	B3FTP3
445310012	B3FTP1
445310013	B3FRM0
445310014	B3FTR6
445310015	B3FTR7
445310017	B3FTR8
445310018	B3FRN9
1203985033	Method Blank (MB)
1203985034	Laboratory Control Sample (LCS)
1203985035	445329001(NonSDG) Sample Duplicate (DUP)
1203985036	445329007(NonSDG) Sample Duplicate (DUP)
1203985037	445329001(NonSDG) Post Spike (PS)
1203985038	445329007(NonSDG) Post Spike (PS)
1203985360	Method Blank (MB)
1203985361	Laboratory Control Sample (LCS)
1203985362	445329010(NonSDG) Sample Duplicate (DUP)
1203985363	445329010(NonSDG) Post Spike (PS)

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.

**Product:** Total Organic Halogens (TOX)

**Analytical Method:** 9020\_TOX

**Analytical Procedure:** GL-GC-E-007 REV# 14

**Analytical Batches:** 1745217, 1745218 and 1745219

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
445310001	B3FTD1
445310002	B3FVJ6
445310003	B3FVJ8
445310004	B3FVK0
445310005	B3FRL2
445310006	B3FVJ9
445310007	B3FVJ7
445310008	B3FRL3
445310009	B3FVK1
445310010	B3FTP2
445310011	B3FTP3
445310012	B3FTP1
445310013	B3FRM0
445310014	B3FTR6
445310015	B3FTR7
445310017	B3FTR8
445310018	B3FRN9
1203985524	Method Blank (MB)
1203985525	Laboratory Control Sample (LCS)
1203985526	445310001(B3FTD1) Sample Duplicate (DUP)
1203985527	445310001(B3FTD1) Post Spike (PS)
1203985528	Method Blank (MB)
1203985529	Laboratory Control Sample (LCS)
1203985530	445310007(B3FVJ7) Sample Duplicate (DUP)
1203985531	445310007(B3FVJ7) Post Spike (PS)
1203985532	Method Blank (MB)
1203985533	Laboratory Control Sample (LCS)
1203985534	445310013(B3FRM0) Sample Duplicate (DUP)
1203985535	445310013(B3FRM0) 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.

#### **Miscellaneous Information**

##### **Additional Comments**

A pair of nitrate wash blanks is analyzed at the start of the batch. Although they are designated as ICB, they are

performed for calculating purposes only. The value of the nitrate wash blanks are averaged and subtracted from all samples. Neither of these values should exceed 0.6 ug Cl. The PQL limit typically applied to ICB results does not apply in this application, since the results are used only to determine background concentrations and are subtracted from all calculated results.

**Breakthrough effect**

Breakthrough effect: If the value for a sample is greater than the reporting limit (10 ug/L), the result for the second slug should not be greater than 25% of the combined value of the first and second slug. Results which do not meet these criteria are designated with a "Fail" comment in the Breakthrough effect column on the Logbook page; however, the "fail" designation is not applicable for samples with a result of less than 10 ug/L.

**Product: Alkalinity****Analytical Method:** 2320\_ALKALINITY**Analytical Procedure:** GL-GC-E-033 REV# 13**Analytical Batch:** 1745547

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>
445310001	B3FTD1
445310005	B3FRL2
445310008	B3FRL3
445310013	B3FRM0
445310018	B3FRN9
1203986246	Laboratory Control Sample (LCS)
1203986247	445538010(NonSDG) 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: GEL445310 GEL Work Order: 445310

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

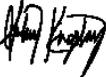
B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

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:** 28 MAR 2018**Title:** Analyst I

# Sample Data Summary



**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVJ6 Project: CPRCOW18001  
 Sample ID: 445310002 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 06:15  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2036	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	U	3.33	3.33	10.0	ug/L		1	RMJ	03/09/18	2223	1745217	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVJ8 Project: CPRCOW18001  
 Sample ID: 445310003 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 06:15  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2115	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	U	3.33	3.33	10.0	ug/L		1	RMJ	03/09/18	2256	1745217	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVK0 Project: CPRCOW18001  
 Sample ID: 445310004 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 06:15  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2153	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	B	5.04	3.33	10.0	ug/L		1	RMJ	03/09/18	2349	1745217	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**Notes:**

Column headers are defined as follows:

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

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FRL2 Project: CPRCOW18001  
 Sample ID: 445310005 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 06:15  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2232	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					
<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	B	4.88	3.33	10.0	ug/L		1	RMJ	03/10/18	0022	1745217	2
<b>Titration and Ion Analysis</b>												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3	U	1450	1450	4000	ug/L			RXB5	03/14/18	1512	1745547	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	
3	2320_ALKALINITY	

**Notes:**

Column headers are defined as follows:

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

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVJ9 Project: CPRCOW18001  
 Sample ID: 445310006 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 09:23  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2311	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		13.8	3.33	10.0	ug/L		1	RMJ	03/13/18	1741	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVJ7 Project: CPRCOW18001  
 Sample ID: 445310007 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 09:23  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/08/18	2350	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		21.1	3.33	10.0	ug/L		1	RMJ	03/13/18	1818	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FRL3 Project: CPRCOW18001  
 Sample ID: 445310008 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 09:23  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	0029	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	B	335	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					
<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		15.2	3.33	10.0	ug/L		1	RMJ	03/13/18	1947	1745218	2
<b>Titration and Ion Analysis</b>												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		115000	1450	4000	ug/L			RXB5	03/14/18	1518	1745547	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	
3	2320_ALKALINITY	

**Notes:**

Column headers are defined as follows:

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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FVK1 Project: CPRCOW18001  
 Sample ID: 445310009 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 09:23  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	0127	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		24.4	3.33	10.0	ug/L		1	RMJ	03/13/18	2021	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FTP2 Project: CPRCOW18001  
 Sample ID: 445310010 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 10:45  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	1232	1744969	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		13.5	3.33	10.0	ug/L		1	RMJ	03/13/18	2113	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FTP3 Project: CPRCOW18001  
 Sample ID: 445310011 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 10:45  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	1311	1744969	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	B	5.62	3.33	10.0	ug/L		1	RMJ	03/13/18	2251	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**Notes:**

Column headers are defined as follows:

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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FTP1 Project: CPRCOW18001  
 Sample ID: 445310012 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 10:45  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	1409	1744969	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	B	8.46	3.33	10.0	ug/L		1	RMJ	03/13/18	2236	1745218	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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

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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FRM0 Project: CPRCOW18001  
 Sample ID: 445310013 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 10:45  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	1449	1744969	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					
<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens	U	3.33	3.33	10.0	ug/L		1	RMJ	03/15/18	1748	1745219	2
<b>Titration and Ion Analysis</b>												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		120000	1450	4000	ug/L			RXB5	03/14/18	1523	1745547	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	
3	2320_ALKALINITY	

**Notes:**

Column headers are defined as follows:

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



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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FTR7 Project: CPRCOW18001  
 Sample ID: 445310015 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 12:20  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	0246	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					

<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		35.3	3.33	10.0	ug/L		1	RMJ	03/15/18	2020	1745219	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**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



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**Certificate of Analysis**

Report Date: March 28, 2018

Company : CH2M Hill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: CHPRC SAF W18-001

Client Sample ID: B3FRN9 Project: CPRCOW18001  
 Sample ID: 445310018 Client ID: CPRC001  
 Matrix: WATER  
 Collect Date: 05-MAR-18 12:20  
 Receive Date: 07-MAR-18  
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1	U	330	330	1000	ug/L		1	TSM	03/09/18	0404	1744949	1
Total Organic Carbon #2	U	330	330	1000	ug/L		1					
Total Organic Carbon #3	U	330	330	1000	ug/L		1					
Total Organic Carbon #4	U	330	330	1000	ug/L		1					
Total Organic Carbon Average	U	330	330	1000	ug/L		1					
<b>Halogen Analysis</b>												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		27.2	3.33	10.0	ug/L		1	RMJ	03/15/18	2158	1745219	2
<b>Titration and Ion Analysis</b>												
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"												
Alkalinity, Total as CaCO3		99200	1450	4000	ug/L			RXB5	03/14/18	1526	1745547	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	
3	2320_ALKALINITY	

**Notes:**

Column headers are defined as follows:

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

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: March 28, 2018

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 445310

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1744949										
QC1203985035	445329001	DUP									
Total Organic Carbon Average	B	483	B	474	ug/L	1.88	^	(+/-1000)	TSM	03/09/18	05:22
QC1203985036	445329007	DUP									
Total Organic Carbon Average	B	372	B	385	ug/L	3.43	^	(+/-1000)		03/09/18	10:54
QC1203985034	LCS										
Total Organic Carbon Average	10000			10000	ug/L			100	(80%-120%)	03/08/18	19:48
QC1203985033	MB										
Total Organic Carbon Average			U	330	ug/L					03/08/18	19:38
QC1203985037	445329001	PS									
Total Organic Carbon Average	10.0	B	0.483	10.8	mg/L			103	(75%-125%)	03/09/18	06:01
QC1203985038	445329007	PS									
Total Organic Carbon Average	10.0	B	0.372	10.7	mg/L			103	(75%-125%)	03/09/18	11:33
Batch	1744969										
QC1203985362	445329010	DUP									
Total Organic Carbon Average	B	446	B	458	ug/L	2.65	^	(+/-1000)	TSM	03/09/18	17:26
QC1203985361	LCS										
Total Organic Carbon Average	10000			9970	ug/L			99.7	(80%-120%)	03/09/18	12:22
QC1203985360	MB										
Total Organic Carbon Average			U	330	ug/L					03/09/18	12:12
QC1203985363	445329010	PS									
Total Organic Carbon Average	10.0	B	0.446	10.8	mg/L			103	(75%-125%)	03/09/18	18:06

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Halogen Analysis</b>											
Batch 1745217											
QC1203985526	445310001	DUP									
Total Organic Halogens		B	8.78	U	3.33	ug/L	122 ^	(+/-10.0)	RMJ	03/09/18	21:01
QC1203985525	LCS										
Total Organic Halogens	100				98.9	ug/L		98.9 (80%-120%)		03/09/18	18:02
QC1203985524	MB										
Total Organic Halogens				U	3.33	ug/L				03/09/18	17:43
QC1203985527	445310001	PS									
Total Organic Halogens	100	B	8.78		108	ug/L		98.8 (75%-125%)		03/09/18	21:22
Batch 1745218											
QC1203985530	445310007	DUP									
Total Organic Halogens			21.1		18.8	ug/L	11.6 ^	(+/-10.0)	RMJ	03/13/18	18:34
QC1203985529	LCS										
Total Organic Halogens	100				105	ug/L		105 (80%-120%)		03/13/18	17:04
QC1203985528	MB										
Total Organic Halogens				U	3.33	ug/L				03/13/18	16:43
QC1203985531	445310007	PS									
Total Organic Halogens	100		21.1		124	ug/L		103 (75%-125%)		03/13/18	18:54
Batch 1745219											
QC1203985534	445310013	DUP									
Total Organic Halogens		U	3.33	B	8.16	ug/L	133 ^	(+/-10.0)	RMJ	03/15/18	18:08
QC1203985533	LCS										
Total Organic Halogens	100				96.3	ug/L		96.3 (80%-120%)		03/15/18	14:41
QC1203985532	MB										
Total Organic Halogens				U	3.33	ug/L				03/15/18	14:22

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**QC Summary**

Workorder: 445310

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Halogen Analysis</b>											
Batch	1745219										
	QC1203985535 445310013 PS										
Total Organic Halogens	100	U	1.64	115	ug/L		113	(75%-125%)	RMJ	03/15/18	18:45
<b>Titration and Ion Analysis</b>											
Batch	1745547										
	QC1203986247 445538010 DUP										
Alkalinity, Total as CaCO3			134000	132000	ug/L	1.36		(0%-20%)	RXB5	03/14/18	15:57
	QC1203986246 LCS										
Alkalinity, Total as CaCO3	100000			107000	ug/L		107	(80%-120%)		03/14/18	15:05

**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 >= 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.