



February 20, 2018

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

Re: CHPRC SAF F17-070
Work Order: 443752
SDG: GEL443752

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 14, 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: 303979
Chain of Custody: F17-070-264, F17-070-265 and F17-070-457
Enclosures

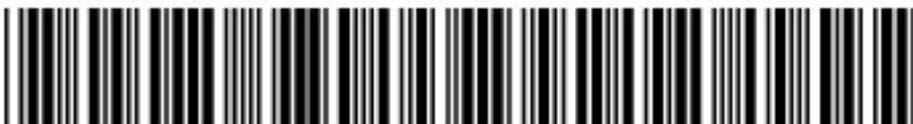


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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION (SIR) REPORT		SIR Number: SIR18-0492 Rev. Number: 0 Date Initiated: 02/20/2018
<u>SAMPLE EVENT INFORMATION</u>		
SAF NUM(S):	F17-070	
LABORATORY:	GEL	
<u>SAMPLING INFORMATION</u>		
NUMBER OF SAMPLES:	1	
SAMPLE NUMBERS:	B3H7X2	
SAMPLE MATRIX:	WATER	
SDG NUM(S):	GEL443752	
<u>ISSUE BACKGROUND</u>		
CLASS:	Field Sampling Issue	
TYPE:	Insufficient Sample Volume Collected	
DESCRIPTION:	One vial for 8260_VOA analysis on sample ID B3H7X2 was received with headspace.	
<u>RESOLUTION</u>		
PROPOSED RESOLUTION:	The lab will avoid using this vials.	
FINAL RESOLUTION:	Accept proposed resolution	
SUBMITTED BY:		
SHAFFER, H	_____	02/16/2018 _____
ACCEPTED BY:		
NAGEL, SE	_____	02/20/2018 _____

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F17-070
SDG: GEL443752**

February 20, 2018

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on February 14, 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:

Laboratory Identification	Sample Description
443752001	B3H7X1
443752002	B3H7X2
443752003	B3H914

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 Volatile, General Chemistry, Metals and Radiochemistry.

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 #: GEL443752
Work Order #: 443752**

GC/MS Volatile

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

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.

Metals

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

Ion Chromatography

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

Technical Information

Sample Dilutions

The following samples 1203971621 (Non SDG 443751001DUP), 1203971622 (Non SDG 443751001PS) and 443752003 (B3H914) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	443752
	003
Chloride	10X
Nitrate	10X
Sulfate	10X

Radiochemistry

I129LL_SEP_LEPS_GS: COMMON (low level)

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.

9310_ALPHABETA_GPC: COMMON

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

Technical Information

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203971825 (B3H7X1MS) and 1203971826 (B3H7X1MSD), aliquots were reduced to conserve sample volume.

TC99_EIE_LSC: COMMON

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.

TRITIUM_DIST_LSC: COMMON

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

Technical Information

Recounts

Sample 1203971950 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information**Additional Comments**

The matrix spike, 1203971949 (B3H7X1MS), aliquot was reduced to conserve sample volume.

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 442752		F17-070-264	PAGE 1 OF 1
COLLECTOR Jeff Tuckaen CHPRC	COMPANY CONTACT LYNCH, SA	TELEPHONE NO. 373-5586	PROJECT COORDINATOR LYNCH, SA	REQUIRED TAT 7 Days	
SAMPLING LOCATION C9607, I-003	PROJECT DESIGNATION 200-UP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO. F17-070		ORIGINAL	
ICE CHEST NO. 605-598	FIELD LOGBOOK NO. HNF-N-645 6-83	ACTUAL SAMPLE DEPTH 343.71	PURCHASE ORDER/CHARGE CODE 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 9040	BILL OF LADING/AIR BILL NO. 7714 68705294			
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION HNO3 to pH <2 None	HNO3 to pH <2 None	HNO3 to pH <2 None	HNO3 to pH <2 None
SPECIAL HANDLING AND/OR STORAGE N/A	HOLDING TIME 6 Months	TYPE OF CONTAINER G/P	NO. OF CONTAINER(S) 1	VOLUME 500mL	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SAMPLE NO. B3H7X1	FILTERED Yes	MATRIX* WATER	SAMPLE DATE FEB 17 2018	SAMPLE TIME 1341	

CHAIN OF POSSESSION RELINQUISHED BY/REMOVED FROM Jeff Tuckaen CHPRC	DATE/TIME 7430 FEB 17 2018	SIGN/ PRINT NAMES RECEIVED BY/STORED IN SSU-1 Roger Friesz Jr. CHPRC	DATE/TIME FEB 12 2018	SPECIAL INSTRUCTIONS TRVL-18-058; Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 Mv (1) 6020_METALS_ICPMS: COMMON {Chromium}; 6020_METALS_ICPMS: COMMON (Add-on) {Manganese, Uranium};
SSU-1 Roger Friesz Jr. CHPRC	0715 FEB 13 2018	FEDEX C-Tamp In (2-14) 8 5730	FEB 13 2018 0715	
DISPOSAL METHOD	DISPOSED BY	DATE/TIME		
FINAL SAMPLE DISPOSITION PRINTED ON 12/13/2017	TRVL NUM = FSR55025	TRVL NUM = TRVL-18-058		A-6003-618 (REV 3)

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F17-070-265	PAGE 1 OF 1
COLLECTOR	Jeff Tucksen CHPRC	COMPANY CONTACT	LYNCH, SA	PROJECT COORDINATOR	LYNCH, SA
SAMPLING LOCATION	C9607, I-003	PROJECT DESIGNATION	200-UP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.	F17-070
ICE CHEST NO.	GWS-598	FIELD LOGBOOK NO.	HNF-N-645 6-83	PURCHASE ORDER/CHARGE CODE	300192
SHIPPED TO	GEL Laboratories, LLC	OFFSITE PROPERTY NO.	9048	BILL OF LADING/AIR BILL NO.	7714 6870 5294
MATRIX*	A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/REMARKS	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		
SPECIAL HANDLING AND/OR STORAGE	N/A	PRESERVATION	HCl or H2SO4 to pH <2/Cool <=6C		
HOLDING TIME	14 Days	TYPE OF CONTAINER	aGS*		
NO. OF CONTAINER(S)	5	VOLUME	40mL		
SAMPLE ANALYSIS	8260, VOA, GCM S: COMMON (Carbon tetrachloride, Trichloroethylene)	SAMPLE DATE	SAMPLE TIME		
B3H7X2	No	FEB 12 2018	1341		

CHAIN OF POSSESSION	RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
SSU-1	Jeff Tucksen CHPRC	FEB 17 2018 1430	SSU-1	SSU-1	FEB 12 2018 1430
SSU-1	Roger Friesz Jr. CHPRC	FEB 13 2018 0715	Roger Friesz Jr. CHPRC	FEDEX	FEB 13 2018 0715
SSU-1	Roger Friesz Jr. CHPRC	FEB 13 2018 1400	C. Tarpin	FEDEX	2/13/18 5300

SPECIAL INSTRUCTIONS
TRVL-18-058; Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 Mv

DISPOSED BY

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

PRINTED ON 12/13/2017

FSR ID = FSR55025

TRVL NUM = TRVL-18-058

A-6003-618 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST *20103* **F17-070-457** **PAGE 1 OF 1**

COLLECTOR Jeff Tuckson
CHPRC

COMPANY CONTACT LYNCH, SA
TELEPHONE NO. 373-5586

PROJECT COORDINATOR LYNCH, SA

SAMPLING LOCATION C9607, I-003

PROJECT DESIGNATION 200-UP-1 Remedial Action Wells Sampling and Analysis - Water

ICE CHEST NO. *625-598*

FIELD LOGBOOK NO. *343.71*

ACTUAL SAMPLE DEPTH *6'*

SAF NO. F17-070

PURCHASE ORDER/CHARGE CODE 300192

SHIPPED TO *625-598*

OFFSITE PROPERTY NO. *9048*

BILL OF LADING/AIR BILL NO. *771468705294*

GEL Laboratories, LLC

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	Cool <=6C		
		48 Hours		
		P		
		1		
		125mL		
		SEE ITEM (1) IN SPECIAL INSTRUCTIONS		
SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME
B3H914	Yes	WATER	FEB 12 2018	1341

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM
Jeff Tuckson
CHPRC

DATE/TIME
1430
FEB 12 2018

SIGN/ PRINT NAMES
RECEIVED BY/STORED IN
SSU-1

DATE/TIME
FEB 12 2018

RELINQUISHED BY/REMOVED FROM
Roger Friess Jr.
CHPRC

DATE/TIME
0715
FEB 13 2018

SIGN/ PRINT NAMES
RECEIVED BY/STORED IN
FEDEX

DATE/TIME
FEB 13 2018

RELINQUISHED BY/REMOVED FROM
Roger Friess Jr.
CHPRC

DATE/TIME
0930
FEB 13 2018

SIGN/ PRINT NAMES
RECEIVED BY/STORED IN
C. Tarpin (Chief)

DATE/TIME
FEB 13 2018

SPECIAL INSTRUCTIONS
TRVL-18-058; Water samples to be purged until field readings of DO stabilize at or above 7,000 µg/L and REDOX potential is at least 200 Mv
(1) 300.0_ANIONS_IC: COMMON {Chloride, Nitrogen in Nitrate, Sulfate};

DISPOSED BY

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

PRINTED ON 12/13/2017

FRS ID = FSR55025

TRVL NUM = TRVL-18-058

A-6003-618 (REV 3)



SAMPLE RECEIPT & REVIEW FORM

HS

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>443752</u>	
Received By: <u>C. Tarplin</u>		Date Received: <u>14 Feb 2018</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7714 6870 5294</u> <u>7714 7148 2691</u> <u>7714 7413 5447</u>	
Suspected Hazard Information		Yes	No
Shipped as a DOT Hazardous?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
COC/Samples marked or classified as radioactive?		<input checked="" type="checkbox"/>	
Is package, COC, and/or Samples marked HAZ?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample Receipt Criteria		Yes	NA
Comments/Qualifiers (Required for Non-Conforming Items)		No	
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	
8	Samples received within holding time?	<input checked="" type="checkbox"/>	
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials MCH Date 02/15/18 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 20 February 2018

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL443752
Work Order #: 443752**

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

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1739833

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752002	B3H7X2
1203973334	Method Blank (MB)
1203973335	Laboratory Control Sample (LCS)
1203973336	443833001(NonSDG) Post Spike (PS)
1203973337	443833001(NonSDG) Post Spike Duplicate (PSD)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL443752 GEL Work Order: 443752

The Qualifiers in this report are defined as follows:

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

T Spike and/or spike duplicate sample recovery is outside control limits.

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

DL Indicates that sample is diluted.

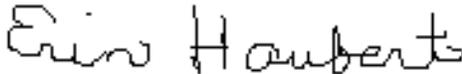
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 19 FEB 2018

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number:	GEL443752	Date Collected:	02/12/2018 13:41	Matrix:	WATER
Lab Sample ID:	443752002	Date Received:	02/14/2018 09:30	Project:	CPRC0F17070
Client ID:	B3H7X2	Client:	CPRC001	SOP Ref:	GL-OA-E-038
Batch ID:	1739833	Method:	SW846 8260C	Dilution:	1
Run Date:	02/16/2018 12:48	Inst:	VOA3.I	Purge Vol:	5 mL
Prep Date:	02/16/2018 12:48	Analyst:	JP1		
Data File:	021618V3\3V507.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride		11.7	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	2.30	ug/L	0.300	2.00	5.00

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 19, 2018

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 443752

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1739833										
QC1203973335	LCS										
Carbon tetrachloride	50.0			49.7	ug/L		99	(70%-130%)	JP1	02/16/18	10:43
Trichloroethylene	50.0			48.3	ug/L		97	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			52.3	ug/L		105	(70%-130%)			
**Bromofluorobenzene	50.0			51.1	ug/L		102	(70%-130%)			
**Toluene-d8	50.0			46.8	ug/L		94	(70%-130%)			
QC1203973334	MB										
Carbon tetrachloride			U	0.300	ug/L					02/16/18	12:17
Trichloroethylene			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			53.1	ug/L		106	(70%-130%)			
**Bromofluorobenzene	50.0			51.5	ug/L		103	(70%-130%)			
**Toluene-d8	50.0			46.9	ug/L		94	(70%-130%)			
QC1203973336	443833001 PS										
Carbon tetrachloride	50.0	U	0.00	58.8	ug/L		118	(70%-130%)		02/16/18	19:07
Trichloroethylene	50.0	U	0.00	53.7	ug/L		107	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		51.1	53.5	ug/L		107	(70%-130%)			

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QC Summary

Workorder: 443752

Page 2 of 3

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1739833										
**Bromofluorobenzene	50.0	50.5		50.0	ug/L		100	(70%-130%)	JP1	02/16/18	19:07
**Toluene-d8	50.0	48.7		46.3	ug/L		93	(70%-130%)			
QC1203973337 443833001 PSD											
Carbon tetrachloride	50.0	U	0.00	55.6	ug/L	6	111	(0%-20%)		02/16/18	19:39
Trichloroethylene	50.0	U	0.00	51.7	ug/L	4	103	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		51.1	49.3	ug/L		99	(70%-130%)			
**Bromofluorobenzene	50.0		50.5	48.3	ug/L		97	(70%-130%)			
**Toluene-d8	50.0		48.7	44.9	ug/L		90	(70%-130%)			

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)

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QC Summary

Workorder: 443752

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	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.

Volatile
Surrogate Recovery Report

SDG Number: GEL443752

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203973335	LCS for batch 1739833	105	94	102
1203973334	MB for batch 1739833	106	94	103
443752002	B3H7X2	107	89	104
1203973336	B3D7T6PS	107	93	100
1203973337	B3D7T6PSD	99	90	97

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(70%-130%)

TOL = Toluene-d8

(70%-130%)

BFB = Bromofluorobenzene

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL443752
Work Order #: 443752

Product: Determination of Metals by ICP-MS
Analytical Method: SW846 3005A/6020B
Analytical Procedure: GL-MA-E-014 REV# 32
Analytical Batch: 1739173

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 14
Preparation Batch: 1739172

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752001	B3H7X1
1203971609	Method Blank (MB)ICP-MS
1203971610	Laboratory Control Sample (LCS)
1203971613	443752001(B3H7X1L) Serial Dilution (SD)
1203971611	443752001(B3H7X1S) Matrix Spike (MS)
1203971612	443752001(B3H7X1SD) 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

ICSA/ICSAB Statement

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

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: GEL443752 GEL Work Order: 443752

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: Nik-Cole Elmore****Date: 19 FEB 2018****Title: Data Validator**

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL443752

CONTRACT: CPRC0F17070

METHOD TYPE: SW846

SAMPLE ID:443752001

BASIS: As Received

DATE COLLECTED 12-FEB-18

CLIENT ID: B3H7X1

LEVEL: Low

DATE RECEIVED 14-FEB-18

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	SKJ	02/15/18 22:44	180215-1	1739173
7439-96-5	Manganese	44.3	ug/L		1	5	5	1	MS	SKJ	02/15/18 22:44	180215-1	1739173
7440-61-1	Uranium	2.27	ug/L		0.067	0.2	0.2	1	MS	SKJ	02/15/18 22:44	180215-1	1739173

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739173	1739172	SW846 3005A	50	mL	50	mL	02/14/18	JXM8

***Analytical Methods:**

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: February 19, 2018

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 443752

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1739173										
QC1203971610	LCS										
Chromium	50.0			50.4	ug/L		101	(80%-120%)	SKJ	02/15/18	22:40
Manganese	50.0			50.6	ug/L		101	(80%-120%)			
Uranium	50.0			51.2	ug/L		102	(80%-120%)			
QC1203971609	MB										
Chromium			U	3.00	ug/L					02/15/18	22:36
Manganese			U	1.00	ug/L						
Uranium			U	0.067	ug/L						
QC1203971611	443752001 MS										
Chromium	50.0	U	3.00	50.3	ug/L		98.4	(75%-125%)		02/15/18	22:48
Manganese	50.0		44.3	93.2	ug/L		97.7	(75%-125%)			
Uranium	50.0		2.27	53.4	ug/L		102	(75%-125%)			
QC1203971612	443752001 MSD										
Chromium	50.0	U	3.00	49.6	ug/L	1.45	97	(0%-20%)		02/15/18	22:52
Manganese	50.0		44.3	90.7	ug/L	2.64	92.9	(0%-20%)			
Uranium	50.0		2.27	51.7	ug/L	3.12	98.9	(0%-20%)			

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QC Summary

Workorder: 443752

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1739173										
QC1203971613	443752001	SDILT									
Chromium	U	1.10	DU	15.0	ug/L	N/A		(0%-20%)	SKJ	02/15/18	23:00
Manganese		44.3	D	8.83	ug/L	.35		(0%-20%)			
Uranium		2.27	D	0.492	ug/L	8.37		(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 \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL443752
Work Order #: 443752**

Product: Ion Chromatography**Analytical Method:** 300.0_ANIONS_IC**Analytical Procedure:** GL-GC-E-086 REV# 25**Analytical Batch:** 1739178

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752003	B3H914
1203971619	Method Blank (MB)
1203971620	Laboratory Control Sample (LCS)
1203971621	443751001(NonSDG) Sample Duplicate (DUP)
1203971622	443751001(NonSDG) Post Spike (PS)

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

Data Summary:

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

Technical Information**Sample Dilutions**

The following samples 1203971621 (Non SDG 443751001DUP), 1203971622 (Non SDG 443751001PS) and 443752003 (B3H914) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	443752
	003
Chloride	10X
Nitrate	10X
Sulfate	10X

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: GEL443752 GEL Work Order: 443752

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 19 FEB 2018

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 19, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF F17-070

Client Sample ID: B3H914 Project: CPRC0F17070
 Sample ID: 443752003 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 12-FEB-18 13:41
 Receive Date: 14-FEB-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
300.0_ANIONS_IC: COMMON "As Received"												
Chloride	D	19400	670	2000	ug/L		10	MAR1	02/14/18	1416	1739178	1
Nitrate-N	D	21900	330	1000	ug/L		10					
Sulfate	D	36200	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	300.0_ANIONS_IC		

Notes:

Column headers are defined as follows:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 19, 2018

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 443752

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1739178										
QC1203971621	443751001	DUP									
Chloride		6870		6860	ug/L	0.124		(0%-20%)	MAR1	02/14/18	18:06
Nitrate-N		372		371	ug/L	0.35	^	(+/-250)			
Sulfate	D	55600	D	55200	ug/L	0.763		(0%-20%)		02/14/18	19:33
QC1203971620	LCS										
Chloride	5000			4830	ug/L			(80%-120%)		02/14/18	17:37
Nitrate-N	2500			2490	ug/L			(80%-120%)			
Sulfate	10000			9950	ug/L			(80%-120%)			
QC1203971619	MB										
Chloride			U	67.0	ug/L					02/14/18	17:08
Nitrate-N			U	33.0	ug/L						
Sulfate			U	133	ug/L						
QC1203971622	443751001	PS									
Chloride	5.00	6.87		12.2	mg/L			(75%-125%)		02/14/18	18:35
Nitrate-N	2.50	0.372		2.85	mg/L			(75%-125%)			
Sulfate	10.0	5.56	D	15.7	mg/L			(75%-125%)		02/14/18	20:02

Notes:

GEL LABORATORIES LLC

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QC Summary

Workorder: 443752

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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The Qualifiers in this report are defined as follows:

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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL443752
Work Order #: 443752

Product: I129LL_SEP_LEPS_GS: COMMON (low level)

Analytical Method: DOE EML HASL-300,I-01 Modified

Analytical Procedure: GL-RAD-A-006 REV# 21

Analytical Batch: 1739364

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752001	B3H7X1
1203972075	Method Blank (MB)
1203972076	443785007(NonSDG) Sample Duplicate (DUP)
1203972077	443785007(NonSDG) Matrix Spike (MS)
1203972078	Laboratory Control Sample (LCS)

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: 9310_ALPHABETA_GPC: COMMON

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001 REV# 19

Analytical Batch: 1739269

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752001	B3H7X1
1203971823	Method Blank (MB)
1203971824	443752001(B3H7X1) Sample Duplicate (DUP)
1203971825	443752001(B3H7X1) Matrix Spike (MS)
1203971826	443752001(B3H7X1) Matrix Spike Duplicate (MSD)
1203971827	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information**Gross Alpha/Beta Preparation Information**

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information**Additional Comments**

The matrix spike and matrix spike duplicate, 1203971825 (B3H7X1MS) and 1203971826 (B3H7X1MSD), aliquots were reduced to conserve sample volume.

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 5

Analytical Batch: 1739213

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752001	B3H7X1
1203971707	Method Blank (MB)
1203971708	443752001(B3H7X1) Sample Duplicate (DUP)
1203971709	Laboratory Control Sample (LCS)

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: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 22

Analytical Batch: 1739317

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
443752001	B3H7X1
1203971947	Method Blank (MB)
1203971948	443752001(B3H7X1) Sample Duplicate (DUP)

1203971949 443752001(B3H7X1) Matrix Spike (MS)
1203971950 Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Sample 1203971950 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike, 1203971949 (B3H7X1MS), aliquot was reduced to conserve sample volume.

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: GEL443752 GEL Work Order: 443752

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: **Name:** Kate Gellatly**Date:** 20 FEB 2018**Title:** Analyst I

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL443752	Client: CPRC001	Project: CPRC0F17070
Lab Sample ID: 443752001	Date Collected: 02/12/2018 13:41	Matrix: WATER
	Date Received: 02/14/2018 09:30	
Client ID: B3H7X1		Prep Basis: "As Received"
Batch ID: 1739269	Method: 9310_ALPHABETA_GPC	SOP Ref: GL-RAD-A-001
Run Date: 02/15/2018 12:33	Analyst: BXG2	Instrument: PIC10A
Data File: AB1739269.xls	Aliquot: 125 mL	Count Time: 130 min
Prep Batch: 1739269	Prep Method: EPA 900.0/SW846 9310	
Prep Date: 02/14/2018 15:30		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA	U	2.32	pCi/L	+/-2.00	2.04	2.97	3.00
12587-47-2	Beta BETA		214	pCi/L	+/-6.96	35.2	1.62	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma). The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL443752	Client: CPRC001	Project: CPRC0F17070
Lab Sample ID: 443752001	Date Collected: 02/12/2018 13:41	Matrix: WATER
	Date Received: 02/14/2018 09:30	
Client ID: B3H7X1	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1739364	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 02/16/2018 06:19	Aliquot: 1.2 L	Instrument: XRAY5
Data File: I443752001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1739364		
Prep Date: 02/15/2018 10:46		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		1.63	pCi/L	+/-0.885	0.900	0.641	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma). The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL443752	Client: CPRC001	Project: CPRC0F17070
Lab Sample ID: 443752001	Date Collected: 02/12/2018 13:41	Matrix: WATER
	Date Received: 02/14/2018 09:30	
Client ID: B3H7X1	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1739213	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 02/18/2018 09:26	Aliquot: 100 mL	Instrument: LSCSILVER
Data File: E1739213.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1739213		
Prep Date: 02/14/2018 13:51		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		335	pCi/L	+/-34.7	50.7	41.7	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24800	29900	CPM	83.1	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL443752	Client: CPRC001	Project: CPRC0F17070
Lab Sample ID: 443752001	Date Collected: 02/12/2018 13:41	Matrix: WATER
	Date Received: 02/14/2018 09:30	
Client ID: B3H7X1	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1739317	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 02/15/2018 13:40	Aliquot: 50 mL	Instrument: LSCRED
Data File: T1739317.xls	Prep Method: EPA 906.0 Modified	Count Time: 50 min
Prep Batch: 1739317		
Prep Date: 02/15/2018 09:42		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		11400	pCi/L	+/-472	2250	279	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: February 20, 2018
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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 443752

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1739364								
QC1203972075	MB								
Iodine-129			U	-0.0789	pCi/L			BSW1	02/16/1807:29
				Uncert: +/-0.394					
				TPU: +/-0.396					
QC1203972076	443785007	DUP							
Iodine-129		UX	0.00	U	0.542				02/16/1807:45
				Uncert: +/-0.663		RPD: 0	N/A		
				TPU: +/-0.668		RER: 1.16	(0-2)		
QC1203972077	443785007	MS							
Iodine-129		UX	0.00		33.0	REC: 95	(75%-125%)		02/16/1807:52
				Uncert: +/-0.663					
				TPU: +/-0.668					
QC1203972078	LCS								
Iodine-129					35.7	REC: 103	(80%-120%)		02/16/1808:38
				Uncert: +/-4.92					
				TPU: +/-6.08					
Rad Gas Flow									
Batch	1739269								
QC1203971823	MB								
Alpha			U	-0.677	pCi/L			BXG2	02/15/1812:33
				Uncert: +/-1.04					
				TPU: +/-1.04					
Beta			U	-0.207	pCi/L				
				Uncert: +/-1.11					
				TPU: +/-1.11					
QC1203971824	443752001	DUP							
Alpha		U	2.32	U	1.96				02/15/1812:33
				Uncert: +/-2.00		RPD: 0	N/A		
				TPU: +/-2.04		RER: 0.254	(0-2)		
Beta					209				
				Uncert: +/-6.96		RPD: 2	(0%-20%)		
				TPU: +/-35.2		RER: 0.191	(0-2)		
QC1203971825	443752001	MS							
Alpha		U	2.32		432	REC: 89	(75%-125%)		02/15/1812:32
				Uncert: +/-2.00					
				TPU: +/-2.04					
Beta					214	REC: 101	(75%-125%)		
				Uncert: +/-6.96					
				TPU: +/-35.2					
QC1203971826	443752001	MSD							
Alpha		U	2.32		425	REC: 88	(75%-125%)		02/15/1812:32
				Uncert: +/-2.00		RPD: 2	(0%-20%)		
				TPU: +/-2.04		RER: 0.116	(0-2)		
Beta					214	REC: 107	(75%-125%)		
				Uncert: +/-6.96		RPD: 6	(0%-20%)		
				TPU: +/-35.2					

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QC Summary

Workorder: 443752

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch		1739269							
		TPU:	+/-35.2	+/-373					
						RER:	0.471 (0-2)		
QC1203971827	LCS								
Alpha	96.7			99.8	pCi/L	REC:	103 (80%-120%)		02/15/1812:32
		Uncert:		+/-8.93					
		TPU:		+/-18.7					
Beta	377			400	pCi/L	REC:	106 (80%-120%)		
		Uncert:		+/-13.6					
		TPU:		+/-66.8					
Rad Liquid Scintillation									
Batch		1739213							
QC1203971707	MB								
Technetium-99			U	1.18	pCi/L			CXS7	02/18/1809:48
		Uncert:		+/-24.1					
		TPU:		+/-24.1					
**Technetium-99m Tracer	29900			24900	CPM	REC:	84 (30%-105%)		
QC1203971708	443752001	DUP							
Technetium-99			335	368	pCi/L				02/18/1810:10
		Uncert:	+/-34.7	+/-34.0		RPD:	9 (0%-20%)		
		TPU:	+/-50.7	+/-53.0		RER:	0.876 (0-2)		
**Technetium-99m Tracer	29900		24800	26000	CPM	REC:	87 (30%-105%)		
QC1203971709	LCS								
Technetium-99	888			771	pCi/L	REC:	87 (80%-120%)		02/18/1810:32
		Uncert:		+/-42.5					
		TPU:		+/-95.2					
**Technetium-99m Tracer	29900			26700	CPM	REC:	89 (30%-105%)		
Batch		1739317							
QC1203971947	MB								
Tritium			U	197	pCi/L			BXM4	02/15/1815:25
		Uncert:		+/-168					
		TPU:		+/-172					
QC1203971948	443752001	DUP							
Tritium			11400	10600	pCi/L				02/15/1816:17
		Uncert:	+/-472	+/-450		RPD:	7 (0%-20%)		
		TPU:	+/-2250	+/-2110		RER:	0.478 (0-2)		
QC1203971949	443752001	MS							
Tritium	5160		11400	16400	pCi/L	REC:	97 (75%-125%)		02/15/1817:09
		Uncert:	+/-472	+/-819					
		TPU:	+/-2250	+/-3270					
QC1203971950	LCS								
Tritium	2580			2310	pCi/L	REC:	90 (80%-120%)		02/16/1807:33
		Uncert:		+/-482					
		TPU:		+/-658					

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

GEL LABORATORIES LLC

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QC Summary

Workorder: 443752

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
*						Duplicate analysis not within control limits				
+						Correlation coefficient for Method of Standard Additions (MSA) is < 0.995				
<						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				
A						The TIC is a suspected aldol-condensation product				
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).				
B						The analyte was detected in both the associated QC blank and in the sample.				
B						The analyte was detected in the associated method blank >= MDC or >5% sample activity.				
C						Analyte has been confirmed by GC/MS analysis				
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						Concentration exceeds the calibration range of the instrument				
E						Reported value is estimated due to interferences. See comment in narrative.				
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				
M						Duplicate precision not met.				
N						Spike Sample recovery is outside control limits.				
P						Aroclor target analyte with greater than 25% difference between column analyses.				
S						Reported value determined by the Method of Standard Additions (MSA)				
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.				
UX						Gamma Spectroscopy--Uncertain identification				
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				
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.

** Indicates analyte is a surrogate compound.

^ 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.

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.