

July 7, 2017



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gel.com

July 05, 2017

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

Re: CHPRC SAF S17-004
Work Order: 425233
SDG: GEL425233

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 10, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071-7H
Chain of Custody: S17-004-318 and S17-004-499
Enclosures



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July 7, 2017

Case Narrative

July 7, 2017

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S17-004
SDG: GEL425233

July 05, 2017

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 10, 2017, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
425233001	B392R4
425233002	B39695

Case Narrative

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

Data Package

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

July 7, 2017

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 7, 2017

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL425233
Work Order #: 425233

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 sample 425233001 (B392R4) was diluted because target analyte concentrations exceeded the calibration range.

Analyte	425233
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

Radiochemistry

SE79_SEP_IE_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

Sample Re-prep/Re-analysis

Samples were re-prepped due to low recovery. The re-analysis is being reported.

Recounts

Sample 1203821238 (REF) was recounted due to low recovery. The recount is reported.

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

July 7, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # S17-004-318	
425233		Page 1 of 1	
Collector Kevin Patterson CHPRC	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	
SAF No. S17-004	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071	
Project Title SURV, APRIL 2017	Logbook No. HNF-N-506	Ice Chest No. GWS-545	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 79348350833	
Protocol CERCLA	Priority: 30 Days	Offsite Property No. 8023	
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR /IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1		SPECIAL INSTRUCTIONS Hold Time N/A	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No. B392R4	Filter N	Date 6/9/17	Time 1200
No/Type Container 1x125-mL GIP	9056_ANIONS_IC; COMMON	Sample Analysis	Preservative Cool <=6C
Holding Time 48 Hours			

Relinquished By Kevin Patterson CHPRC	Print 	Sign Janelle Zunker CHPRC	Received By Janelle Zunker CHPRC	Date/Time JUN 09 2017 12:10	Date/Time JUN 09 2017 12:10	Matrix *
Relinquished By Janelle Zunker CHPRC	Print 	Sign FEDEX	Received By FEDEX	Date/Time JUN 09 2017 1400	Date/Time JUN 09 2017 1400	Soil = Sediment = Solid = Sludge = Water = Oil = Air =
Relinquished By Kevin Patterson CHPRC	Print 	Sign FEDEX	Received By FEDEX	Date/Time JUN 09 2017 1400	Date/Time JUN 09 2017 1400	Drum Solids = Drum Liquids = Tissue = Wipe = Liquid = Vegetation = Other =
Relinquished By	Print	Sign	Received By	Date/Time	Date/Time	
			APR STACY ROONE	6-10-17	8:45	
FINAL SAMPLE DISPOSITION			Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Date/Time	

FSR ID = FSR42589

PRINTED ON 3/9/2017

A-6004-842 (REV 2)

July 7, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # S17-004-499	
4250233		Page 1 of 1	
Collector: Kevin Patterson CHERC	Contact/Requester: Karen Waters-Husted	Telephone No. 509-376-4650	
SAF No. S17-004	Sampling Origin: Hanford Site	Purchase Order/Charge Code 300071	
Project Title: SURV, APRIL 2017	Logbook No. HNF-N-506	Ice Chest No. CWS-632	
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No. 7793 4835 119	
Protocol: CERCLA	Priority: 30 Days	Offsite Property No. 8023	
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No. B39695	Filter: N	Time: 6/9/17	Time: 1200
	No/Type Container: W	Sample Analysis: SE79_SEP_IE_LSC: COMMON	Holding Time: 6 Months
	Preservative: HNO3 to pH <2		

Relinquished By: Kevin Patterson CHERC	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1210	Received By: Janelle Zunker CHPRC	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1210
Relinquished By: Janelle Zunker CHPRC	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1440	Received By: [Signature]	Print: FEDEX	Sign: FEDEX	Date/Time: JUN 09 2017 1440
Relinquished By: [Signature]	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1440	Received By: [Signature]	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1440
Relinquished By: [Signature]	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1440	Received By: [Signature]	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 09 2017 1440

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

FINAL SAMPLE DISPOSITION

PRINTED ON 3/9/2017

FSR ID = FSR42589

A-6004-842 (REV 2)

July 7, 2017

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC SDG/AR/COC/Work Order: 425233
 Received By: STACY BOONE Date Received: JUNE 10, 2017
 Carrier and Tracking Number: 7793 4221 5750 -13c 7793 4835 0752 -21c
7793 4221 5521 -13c 7793 4835 1119-1c
7793 4835 1027 -1c 7793 4221 5543 -1c
7793 4835 0833 -1c 7793 4835 0925 -1c

Suspected Hazard Information: Yes No
 *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Shipped as a DOT Hazardous?: Hazard Class Shipped: _____ UN#: _____

COC/Samples marked or classified as radioactive? Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr
 Classified as: Rad 1 Rad 2 Rad 3

Is package, COC, and/or Samples marked HAZ? If yes, select Hazards below, and contact the GEL Safety Group.
 PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>1R3-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No ___ N/A Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):
7793 4835 0627 -1c
SAMPLE ID B3BIY6 10F3 BROKEN DURING HANDLING WO:425-235-027

PM (or PMA) review: Initials PL Date 07.13.17 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

July 7, 2017

Laboratory Certifications

List of current GEL Certifications as of 05 July 2017

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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

July 7, 2017

General Chem Analysis

Case Narrative

July 7, 2017

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL425233
Work Order #: 425233

Product: Ion Chromatography

Analytical Method: 9056_ANIONS_IC

Analytical Procedure: GL-GC-E-086 REV# 25

Analytical Batch: 1673045

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425233001	B392R4
1203808986	Method Blank (MB)
1203808987	Laboratory Control Sample (LCS)
1203808988	425231004(NonSDG) Sample Duplicate (DUP)
1203808989	425231004(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 sample 425233001 (B392R4) was 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	425233
	001
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.

July 7, 2017

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: GEL425233 GEL Work Order: 425233

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: 26 JUN 2017

Title: Analyst I

Sample Data Summary

Certificate of Analysis

Report Date: June 26, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S17-004

Client Sample ID: B392R4	Project: CPRCOS17004
Sample ID: 425233001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 09-JUN-17 12:00	
Receive Date: 10-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	388	33.0	500	ug/L		1	MAR1	06/10/17	1519	1673045	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	40300	670	2000	ug/L		10	MAR1	06/10/17	1646	1673045	2
Nitrate-N	D	24100	330	1000	ug/L		10					
Sulfate	D	51400	1330	4000	ug/L		10					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	

Notes:

Column headers are defined as follows:

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

Quality Control Summary

July 7, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 26, 2017

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 425233

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673045										
QC1203808988	425231004	DUP									
Chloride		9330		9350	ug/L	0.165		(0%-20%)	MAR1	06/10/17	19:10
Fluoride	B	463	B	463	ug/L	0.0648	^	(+/-500)			
Nitrate-N		2090		2090	ug/L	0.125		(0%-20%)			
Nitrite-N	U	33.0	U	33.0	ug/L	N/A					
Sulfate		18500		18400	ug/L	0.306		(0%-20%)			
QC1203808987	LCS										
Chloride	5000			4870	ug/L		97.5	(80%-120%)		06/10/17	18:41
Fluoride	2500			2550	ug/L		102	(80%-120%)			
Nitrate-N	2500			2460	ug/L		98.2	(80%-120%)			
Nitrite-N	2500			2510	ug/L		100	(80%-120%)			
Sulfate	10000			10100	ug/L		101	(80%-120%)			
QC1203808986	MB										
Chloride			U	67.0	ug/L					06/10/17	18:12
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						

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GEL LABORATORIES LLC

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

QC Summary

Workorder: 425233

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673045										
Nitrite-N			U	33.0	ug/L				MAR1	06/10/17	18:12
Sulfate			U	133	ug/L						
QC1203808989	425231004	PS									
Chloride	5.00	9.33		15.1	mg/L		116	(75%-125%)		06/10/17	19:39
Fluoride	2.50	B	0.463	2.92	mg/L		98.1	(75%-125%)			
Nitrate-N	2.50		2.09	4.66	mg/L		103	(75%-125%)			
Nitrite-N	2.50	U	0.00	2.44	mg/L		97.7	(75%-125%)			
Sulfate	10.0	18.5		29.5	mg/L		110	(75%-125%)			

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

July 7, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425233

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
----------	-----	--------	------	----	-------	------	------	-------	-------	------	------

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

July 7, 2017

Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL425233

Work Order #: 425233

Product: SE79_SEP_IE_LSC: COMMON

Analytical Method: SE79_SEP_IE_LSC

Analytical Procedure: GL-RAD-A-031 REV# 13

Analytical Batch: 1678200

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425233002	B39695
1203821232	Method Blank (MB)
1203821233	425233002(B39695) Sample Duplicate (DUP)
1203821234	Laboratory Control Sample (LCS)
1203821238	Reference (REF)

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 Re-prep/Re-analysis

Samples were re-prepped due to low recovery. The re-analysis is being reported.

Recounts

Sample 1203821238 (REF) was recounted due to low recovery. The recount is reported.

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.

July 7, 2017

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: GEL425233 GEL Work Order: 425233

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: Heather McCarty

Date: 06 JUL 2017

Title: Analyst II

Sample Data Summary

July 7 2017 Rad

Certificate of Analysis
Sample Summary

SDG Number: GEL425233
Lab Sample ID: 425233002

Client: CPRC001
Date Collected: 06/09/2017 12:00
Date Received: 06/10/2017 08:45

Project: CPRC0S17004
Matrix: WATER

Client ID: B39695
Batch ID: 1678200
Run Date: 07/01/2017 05:37
Data File: SE1678200R3.xls
Prep Batch: 1678200
Prep Date: 06/29/2017 09:29

Method: SE79_SEP_IE_LSC
Analyst: CXS7
Aliquot: 0.08 L
Prep Method: NERC ORD

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-031
Instrument: LSCBLUE
Count Time: 60 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	U	-13.7	pCi/L	+/-22.7	22.7	39.1	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	10.1	20.0	mg	50.5	(40%-110%)

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

QC Summary

Report Date: July 6, 2017
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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 425233

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1678200								
QC1203821232	MB								
Selenium-79			U	2.09	pCi/L			CXS7	07/01/1709:46
				Uncert: +/-12.0					
				TPU: +/-12.0					
**Selenium Carrier	20.0			19.4	mg	REC: 97	(40%-110%)		
QC1203821233	425233002	DUP							
Selenium-79		U	-13.7	U	11.4				07/01/1710:49
			Uncert: +/-22.7			RPD: 0	N/A		
			TPU: +/-22.7			RER: 1.95	(0-2)		
**Selenium Carrier	20.0		10.1		21.1	mg	REC: 106	(40%-110%)	
QC1203821234	LCS								
Selenium-79	19600				16300	pCi/L	REC: 83	(80%-120%)	07/01/1711:50
					Uncert: +/-320				
					TPU: +/-463				
**Selenium Carrier	20.0				19.9	mg	REC: 100	(40%-110%)	
QC1203821238	REF								
Selenium-79					19600	pCi/L			07/03/1721:02
					Uncert: +/-388				
					TPU: +/-560				
**Selenium Carrier	20.0				20.0	mg	REC: 100	(40%-110%)	

Notes:

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

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).
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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

QC Summary

Workorder: 425233

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	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.

** 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.