

July 21, 2016



July 21, 2016

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

Re: CHPRC SAF X16-033
Work Order: 400139
SDG: GEL400139

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 25, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 303064 - 7H
Chain of Custody: X16-033-055
Enclosures



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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-033
SDG: GEL400139

July 21, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 25, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
400139001	B358J0
400139002	B358J2

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: 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.

July 21, 2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400139
Work Order #: 400139

Metals

Determination of Metals by ICP

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.

Radiochemistry

SRISO_SEP_PRECIP_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

Recounts

Sample 400139001 (B358J0) was verified by recounting at least five days from the separation date. The recount is reported.

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 400139001 (B358J0) was recounted to verify sample results. The recount results are similar to the original results. Original results are 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

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **X16-033-055**
 Page 1 of 1

Collector: Juan Aguilar *CHP* **Telephone No.:** 509-376-4650
SAF No.: X16-033 **Contact/Requester:** Karen Waters-Husted
Project Title: AQUIFER TUBES, JUNE 2016 **Sampling Origin:** Hanford Site
Shipped To (Lab): GEL Laboratories, LLC **Logbook No.:** HNF-N-506 79/28 **Purchase Order/Charge Code:** 303064
Protocol: CERCLA **Method of Shipment:** Commercial Carrier **Ice Chest No.:** GWS-933
Priority: 30 Days **Bill of Lading/Air Bill No.:** 770604885062
Offsite Property No.: 6774

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: Total Activity Exemption: Yes No
 N/A

Sample No.	Filter	* Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B358J0	N	6-24-16	1049	1x500-mL G/P	6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B358J0	N	↓	↓	3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B358J0	N	↓	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B358J2	Y	6-24-16	1049	1x500-mL G/P	6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

Relinquished By <i>Juan Aguilar</i>	Date/Time JUN 24 2016 11:00	Received By Troy Bacon CHPRC	Sign <i>Troy Bacon</i>	Print Troy Bacon	Date/Time JUN 24 2016 11:00	Matrix *
Relinquished By <i>Juan Aguilar</i>	Date/Time JUN 24 2016 14:00	Received By FEDEX	Sign	Print	Date/Time JUN 24 2016 08:35	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By <i>Juan Aguilar</i>	Date/Time JUN 24 2016 14:00	Received By <i>M. Kasten</i>	Sign <i>M. Kasten</i>	Print	Date/Time 6-25-16 08:35	
Relinquished By <i>Juan Aguilar</i>	Date/Time JUN 24 2016 14:00	Received By <i>M. Kasten</i>	Sign <i>M. Kasten</i>	Print	Date/Time 6-25-16 08:35	

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

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>400139</u>	
Received By: <u>MK</u>		Date Received: <u>6-25-16</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>Cpm 2</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2 C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>30462962</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in-relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7766 0488 4136 2 C</u> <u>5062 2 C</u> <u>5246 2 C</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials NS Date 6/27/16 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 21 July 2016

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	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400139
Work Order #: 400139

Product: Determination of Metals by ICP

Analytical Method: 6010_METALS_ICP

Analytical Procedure: GL-MA-E-013 REV# 26

Analytical Batch: 1577375

Preparation Method: SW846 3005A

Preparation Procedure: GL-MA-E-006 REV# 13

Preparation Batch: 1577374

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400139001	B358J0
400139002	B358J2
1203574642	Method Blank (MB)ICP
1203574643	Laboratory Control Sample (LCS)
1203574646	400138001(NonSDGL) Serial Dilution (SD)
1203574644	400138001(NonSDGS) Matrix Spike (MS)
1203574645	400138001(NonSDGSD) Matrix Spike Duplicate (MSD)

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: GEL400139 GEL Work Order: 400139

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: 20 JUL 2016

Title: Group Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400139

CONTRACT: CPRC0X16033

METHOD TYPE: SW846

SAMPLE ID:400139001

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B358J0

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	67.9	ug/L		15	50	50	1	P	HSC	07/06/16 11:39	070616-1	1577375
7440-70-2	Calcium	59200	ug/L		50	200	200	1	P	HSC	07/06/16 11:39	070616-1	1577375
7439-89-6	Iron	173	ug/L		30	100	100	1	P	HSC	07/06/16 11:39	070616-1	1577375
7439-95-4	Magnesium	12700	ug/L		110	300	300	1	P	HSC	07/06/16 11:39	070616-1	1577375
7440-09-7	Potassium	4560	ug/L		50	150	150	1	P	HSC	07/06/16 11:39	070616-1	1577375
7440-23-5	Sodium	43200	ug/L		100	300	300	1	P	HSC	07/06/16 11:39	070616-1	1577375
7440-62-2	Vanadium	4.88	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:39	070616-1	1577375

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

***Analytical Methods:**

P SW846 3005A/6010C

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400139

CONTRACT: CPRC0X16033

METHOD TYPE: SW846

SAMPLE ID:400139002

BASIS: As Received

DATE COLLECTED 24-JUN-16

CLIENT ID: B358J2

LEVEL: Low

DATE RECEIVED 25-JUN-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	65.8	ug/L		15	50	50	1	P	HSC	07/06/16 11:42	070616-1	1577375
7440-70-2	Calcium	58500	ug/L		50	200	200	1	P	HSC	07/06/16 11:42	070616-1	1577375
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/06/16 11:42	070616-1	1577375
7439-95-4	Magnesium	12600	ug/L		110	300	300	1	P	HSC	07/06/16 11:42	070616-1	1577375
7440-09-7	Potassium	4400	ug/L		50	150	150	1	P	HSC	07/06/16 11:42	070616-1	1577375
7440-23-5	Sodium	44200	ug/L		100	300	300	1	P	HSC	07/06/16 11:42	070616-1	1577375
7440-62-2	Vanadium	4.57	ug/L	B	1	5	5	1	P	HSC	07/06/16 11:42	070616-1	1577375

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577375	1577374	SW846 3005A	50	mL	50	mL	06/27/16	SXW1

***Analytical Methods:**

P SW846 3005A/6010C

Quality Control Summary

July 21, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 21, 2016

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400139

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1577375										
QC1203574643	LCS										
Boron	500			525	ug/L		105	(80%-120%)	HSC	07/06/16	11:03
Calcium	5000			5230	ug/L		105	(80%-120%)			
Iron	5000			5270	ug/L		105	(80%-120%)			
Magnesium	5000			5210	ug/L		104	(80%-120%)			
Potassium	5000			5020	ug/L		100	(80%-120%)			
Sodium	5000			5190	ug/L		104	(80%-120%)			
Vanadium	500			509	ug/L		102	(80%-120%)			
QC1203574642	MB										
Boron			U	15.0	ug/L					07/06/16	10:59
Calcium			U	50.0	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Potassium			U	50.0	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
QC1203574644	400138001	MS									
Boron	500	U	15.0	521	ug/L		103	(75%-125%)		07/06/16	11:11
Calcium	5000	U	50.0	5230	ug/L		104	(75%-125%)			
Iron	5000	U	30.0	5270	ug/L		105	(75%-125%)			
Magnesium	5000	U	110	5210	ug/L		104	(75%-125%)			
Potassium	5000	U	50.0	4980	ug/L		99.6	(75%-125%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400139

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1577375										
Sodium	5000	U	100	5070	ug/L		101	(75%-125%)	HSC	07/06/16	11:11
Vanadium	500	U	1.00	505	ug/L		101	(75%-125%)			
QC1203574645	400138001	MSD									
Boron	500	U	15.0	520	ug/L	0.202	102	(0%-20%)		07/06/16	11:14
Calcium	5000	U	50.0	5210	ug/L	0.32	104	(0%-20%)			
Iron	5000	U	30.0	5340	ug/L	1.29	107	(0%-20%)			
Magnesium	5000	U	110	5270	ug/L	1.11	105	(0%-20%)			
Potassium	5000	U	50.0	4980	ug/L	0.0582	99.6	(0%-20%)			
Sodium	5000	U	100	5060	ug/L	0.0829	101	(0%-20%)			
Vanadium	500	U	1.00	502	ug/L	0.614	100	(0%-20%)			
QC1203574646	400138001	SDILT									
Boron		U	7.35 DU	75.0	ug/L	N/A		(0%-10%)		07/06/16	11:17
Calcium		U	24.3 DU	250	ug/L	N/A		(0%-10%)			
Iron		U	0.631 DU	150	ug/L	N/A		(0%-10%)			
Magnesium		U	-10.6 DU	550	ug/L	N/A		(0%-10%)			
Potassium		U	-2.42 DU	250	ug/L	N/A		(0%-10%)			
Sodium		U	-23.4 DU	500	ug/L	N/A		(0%-10%)			
Vanadium		U	0.114 DU	5.00	ug/L	N/A		(0%-10%)			

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400139
Work Order #: 400139

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1579220

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400139001	B358J0
1203579106	Method Blank (MB)
1203579107	400141005(NonSDG) Sample Duplicate (DUP)
1203579108	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 400139001 (B358J0) was verified by recounting at least five days from the separation date. The recount is reported.

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1579141

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400139001	B358J0
1203578832	Method Blank (MB)
1203578833	400025001(NonSDG) Sample Duplicate (DUP)
1203578834	400025001(NonSDG) Matrix Spike (MS)
1203578835	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 400139001 (B358J0) was recounted to verify sample results. The recount results are similar to the original results. Original results are 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.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400139 GEL Work Order: 400139

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 JUL 2016

Title: Analyst I

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400139	Client: CPRC001	Project: CPRC0X16033
Lab Sample ID: 400139001	Date Collected: 06/24/2016 10:49	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B358J0	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/18/2016 12:24	Aliquot: 300 mL	Instrument: PIC13B
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		253	pCi/L	+/-5.92	40.3	0.768	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.40	7.37	mg	86.9	(40%-110%)

Comments:

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: GEL400139	Client: CPRC001	Project: CPRC0X16033
Lab Sample ID: 400139001	Date Collected: 06/24/2016 10:49	Matrix: WATER
	Date Received: 06/25/2016 08:45	
Client ID: B358J0	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/13/2016 17:43	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 7.65000009536743 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		2.96E+05	pCi/L	+/-5810	57500	669	400

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

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Quality Control Summary

July 21, 2016

GEL LABORATORIES LLC

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QC Summary

Report Date: July 20, 2016
Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 400139

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, QC Criteria, Range, Analyst, Date Time. Contains data for Rad Gas Flow and Rad Liquid Scintillation tests.

Notes:

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

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).
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.

July 21, 2016

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QC Summary

Workorder: 400139

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
D										
E										
M										
N										
S										
U										
UX										
W										
X										
Y										
Z										

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.