GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
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gel.com

February 22, 2017

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

Re: CHPRC SAF F16-028
Work Order: 415150
SDG: GEL415150

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 27, 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: 300192 - 8H
Chain of Custody: F16-028-065
Enclosures

SAMPLE ISSUE RESOLUTION

SIR NUM	SIR17-470
REV NUM	0
DATE INITIATED	3/2/2017

SAMPLE EVENT INFORMATION

SAF NUM(S)	F16-028
OPERABLE UNIT(S)	200-WA-1
PROJECT(S)	200-WA-1
SAMPLE EVENT TITLE(S)	200-WA-1 OU OPPORTUNISTIC SAMPLING C9414 AND C9567 - SOIL
LABORATORY	GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES	1
SAMPLE NUMBERS	B36M10
SAMPLE MATRIX	SOIL
COLLECTION DATE	1/25/2017 - 1/25/2017
SDG NUM	GEL415150

ISSUE BACKGROUND

CLASS	Chain of Custody Issue (Field)
TYPE	No/Illegible Relinquisher/Receiver Listed on COC
DESCRIPTION	COC F16-028-065, SAMPLE B36M10 Missing signature and time in thrid relinquished by box

DISPOSITION

DESCRIPTION	DOCUMENT AND CLOSE
JUSTIFICATION	DOCUMENT AND CLOSE

SUBMITTED BY: Siobhan Calixto DATE: 02/23/2017
ACCEPTED BY: Kirsten Killand DATE: 03/02/2017

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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-028
SDG: GEL415150

February 22, 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 January 27, 2017, for analysis. The sample was 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 sample:

Laboratory Identification	Sample Description
415150001	B36M10

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, 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.

B Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL415150
Work Order #: 415150

Metals

Determination of Metals by ICP-MS

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 ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	415150
	001
Uranium	2X

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.

Miscellaneous Information

Manual Integrations
Samples 1203719658 (B36M10DUP) and 415150001 (B36M10) were manually integrated to correctly position the baseline as set in the calibration standards.

pH

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

Technical Information

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

Sample	Analyte	Value
1203716728 (B36M10DUP)	pH	Received 27-JAN-17, out of holding 25-JAN-17
415150001 (B36M10)	pH	Received 27-JAN-17, out of holding 25-JAN-17

Radiochemistry

AMCMISO_EIE_PRECIP_AEA: 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 1203718268 (LCS) was recounted due to high carrier/tracer yield. The recount is reported.

NP237_IE_PRECIP_AEA: 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.

PUISO_PRECIP_AEA: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.

THISO_IE_PLATE_AEA: 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.

UISO_IE_PRECIP_AEA: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 415150001 (B36M10) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

Dry Weight

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.

GAMMA_GS:COMMON + (Add-on)

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.

I129_SEP_LEPS_GS

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.

SRTOT_SEP_PRECIP_GPC: 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.

TC99_SEP_GPC

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

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.

C14_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.

NI63_LSC

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
Sample 415150001 (B36M10) was reprepped due to high recovery. The re-analysis is being 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

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-028-065	PAGE 1 OF 2
COLLECTOR: Jeff Tucksen CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: 8H	DATA TURNAROUND: 30 Days / 30 Days
SAMPLING LOCATION: C9567, I-005	PROJECT DESIGNATION: 200-WA-1 Opportunistic sampling - soil		SAF NO.: F16-028	AIR QUALITY: ☐	
ICE CHEST NO.: GWS-612	FIELD LOGBOOK NO.: HNF-N-645 2 - 62	ACTUAL SAMPLE DEPTH: 245.82 - 247.35	COA: 300192	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 7486		BILL OF LADING/AIR BILL NO.: 7782 8683 1215		

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
NA

PRESERVATION	Cool <=6C	None	None	None	None
HOLDING TIME	6 Months	6 Months	6 Months	None	ASAP
TYPE OF CONTAINER	G/P	G/P	G/P	Moisture Resistant Cont.	G/P
NO. OF CONTAINER(S)	1	1	1	1	1
VOLUME	250mL	250mL	500mL	200g	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B36M10	SOIL	JAN 25 2017	1330	✓	✓	✓	✓	✓

415150

2/23/2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Jeff Tucksen CHPRC	DATE/TIME: JAN 25 2017 1430	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: JAN 25 2017 1430
RELINQUISHED BY/REMOVED FROM: SSU#1	DATE/TIME: JAN 26 2017 0700	RECEIVED BY/STORED IN: Janelle Zunker CHPRC	DATE/TIME: JAN 26 2017 0700
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC	DATE/TIME: JAN 26 2017	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fed Ex	DATE/TIME:	RECEIVED BY/STORED IN: Ashley Goodman	DATE/TIME: 1/27/17 0855
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

LABORATORY SECTION	RECEIVED BY: Ashley Goodman	TITLE: PMA	DATE/TIME: 1/27/17 0855
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME: 1/31/17

PRINTED ON 8/11/2016 FSR ID = FSR33062 TRVL NUM = TRVL-16-060 A-6003-618 (REV 2)

REV. 1

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-028-065	PAGE 2 OF 2
COLLECTOR Jeff Tucksen CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9567, I-005	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY ☐	30 Days / 30 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-645 4 - 62	ACTUAL SAMPLE DEPTH FT 245.82 - 247.35	COA 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 7486		BILL OF LADING/AIR BILL NO. 7782 8683 1215		

SPECIAL INSTRUCTIONS

TRVL-16-060
(1) 6020_METALS_ICPMS: COMMON (Add-on) {Uranium}; 9056_ANIONS_IC: COMMON {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; 9056_ANIONS_IC: COMMON (Add-on) {Phosphorus in phosphate};
(2) GAMMA_GS: COMMON; GAMMA_GS: COMMON (Add-on) {Radium-226, Radium-228};
(3) AMCMISO_IE_PRECIP_AEA: COMMON {Americium-241}; C14_LSC: COMMON; I129_SEP_LEPS_GS: COMMON; NI63_LSC: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; THISO_IE_PLATE_AEA: COMMON {Thorium-232}; UISO_IE_PRECIP_AEA: COMMON; NP237_IE_PRECIP_AEA: COMMON; TRITIUM_DIST_LSC: COMMON;
(4) Moisture Content - D2216 {Percent moisture (wet sample)};
(5) 9045_pH (Non-Aqueous): COMMON {pH Measurement};

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	SDG/AR/COC/Work Order: 415150
Received By: AG	Date Received: 1/27/17

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?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: ~~Ice bags~~ Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 1°C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): E510200918 5
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?			✓	Sample ID's, containers affected and observed pH: See Continuation form If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials contain acid preservation?	✓			(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7782 8683 1329 7782 8683 0679 7782 8683 1362 7782 8683 1248 7782 8683 1215

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 1/31/17 Page 1 of 2

GL-CHL-SR-001 Rev 3

GEL Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

Client: CPRC Received By: AG Date Received: 1/27/17 SDG/AR/COC/Work Order: 415150

Containers should contain HNO_3 as preservative, but they do NOT!:

IDs affected: B380T8
B380T5
B38046
B38042
B386M4
B386M2

PM (or PMA) review: Initials NS Date 1/31/17 Page 2 of 2

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 22−FEB−17

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 (0rganics 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 >= 2X the MDA and, after corrections, result is >= 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 >= 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 >= 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 22 February 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	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	T104704235−17−12
Utah NELAP	SC000122016−21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL415150
Work Order #: 415150

Product: **Determination of Metals by ICP-MS**
Analytical Method: SW846 3050B/6020B
Analytical Procedure: GL-MA-E-014 REV# 28
Analytical Batch: 1634971

Preparation Method: SW846 3050B
Preparation Procedure: GL-MA-E-009 REV# 26
Preparation Batch: 1634970

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203717290	Method Blank (MB)**ICP-MS**
1203717291	Laboratory Control Sample (LCS)
1203717294	415150001(B36M10L) Serial Dilution (SD)
1203717292	415150001(B36M10D) Sample Duplicate (DUP)
1203717293	415150001(B36M10S) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" 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
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. The ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	415150
	001
Uranium	2X

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: GEL415150 GEL Work Order: 415150

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: Nik-Cole A. Elmore **Name: Nik-Cole Elmore**

Date: 01 FEB 2017 **Title: Data Validator**

Sample Data Summary

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL415150 **CONTRACT:** CPRC0F16028 **METHOD TYPE:** SW846

SAMPLE ID: 415150001 **BASIS:** Dry Weight **DATE COLLECTED** 25−JAN−17

CLIENT ID: B36M10 **LEVEL:** Low **DATE RECEIVED** 27−JAN−17

MATRIX: SOIL **%SOLIDS:** 87

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−61−1	Uranium	662	ug/kg	D	14.4	43.6	43.6	2	MS	SKJ	01/31/17 08:54	170130−1	1634971

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1634971	1634970	SW846 3050B	0.525	g	50	mL	01/30/17	SXW1

***Analytical Methods:**

MS **SW846 3050B/6020B**

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 1, 2017

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **415150**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1634971											
QC1203717292 415150001 DUP											
Uranium		D	662	D	585	ug/kg	12.5		(0%-20%)	SKJ	01/31/17 08:58
QC1203717291 LCS											
Uranium	4840			D	5090	ug/kg		105	(80%-120%)		01/31/17 08:50
QC1203717290 MB											
Uranium				DU	13.1	ug/kg					01/31/17 08:46
QC1203717293 415150001 MS											
Uranium	5480	D	662	D	6220	ug/kg		102	(75%-125%)		01/31/17 09:02
QC1203717294 415150001 SDILT											
Uranium		D	3.04	D	0.612	ug/L	.592		(0%-20%)		01/31/17 09:06

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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QC Summary

Workorder: **415150**

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

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 #: GEL415150
Work Order #: 415150

Product: **Ion Chromatography**
Analytical Method: 9056_ANIONS_IC
Analytical Procedure: GL-GC-E-086 REV# 25
Analytical Batches: 1635879 and 1635878

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203719656	Method Blank (MB)
1203719657	Laboratory Control Sample (LCS)
1203719658	415150001(B36M10) Sample Duplicate (DUP)
1203719659	415150001(B36M10) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

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

Miscellaneous Information

Manual Integrations
Samples 1203719658 (B36M10DUP) and 415150001 (B36M10) were manually integrated to correctly position the baseline as set in the calibration standards.

Product: **pH**
Analytical Method: SW846 9045D
Analytical Procedure: GL-GC-E-008 REV# 22
Analytical Batch: 1634765

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203716727	Laboratory Control Sample (LCS)
1203716728	415150001(B36M10) Sample Duplicate (DUP)

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

Data Summary:

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

Technical Information

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

Sample	Analyte	Value
1203716728 (B36M10DUP)	pH	Received 27-JAN-17, out of holding 25-JAN-17
415150001 (B36M10)	pH	Received 27-JAN-17, out of holding 25-JAN-17

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: GEL415150 GEL Work Order: 415150

The Qualifiers in this report are defined as follows:

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

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

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

Review/Validation

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

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

Signature: **Name: Aubrey Kingsbury**

Date: 13 FEB 2017 **Title: Analyst I**

Sample Data Summary

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: February 13, 2017

Company :	CH2MHill Plateau Remediation Company
Address :	MSIN R3-50 CHPRC PO Box 1600 Richland, Washington 99352
Contact:	Mr. Scot Fitzgerald
Project:	CHPRC SAF F16-028

Client Sample ID:	B36M10	Project:	CPRC0F16028
Sample ID:	415150001	Client ID:	CPRC001
Matrix:	SOIL		
Collect Date:	25-JAN-17 13:30		
Receive Date:	27-JAN-17		
Collector:	Client		
Moisture:	12.5%		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC:COMMON + (Add-on) "Dry Weight Corrected"												
Chloride		2530	823	2290	ug/Kg	10.0	1	MAR1	02/09/17	1531	1635879	1
Fluoride	B	830	389	1140	ug/Kg	10.0	1					
Nitrate-N	B	783	377	1140	ug/Kg	10.0	1					
Nitrite-N	U	377	377	1140	ug/Kg	10.0	1					
Phosphorus in phosphate	U	766	766	2290	ug/Kg	10.0	1					
Sulfate		7490	1520	4570	ug/Kg	10.0	1					
Titration and Ion Analysis												
9045_pH (Non-Aqueous):COMMON "As Received"												
pH at Temp 20.8C	X	8.65	0.010	0.100	SU		1	RXB5	01/27/17	1742	1634765	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9056A	SW846 9056A Total Anions in Soil	MXL2	02/09/17	1023	1635878

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	SW846 9045D	

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 13, 2017

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **415150**

Parmname	NOM		Sample	Qual	QC	Units	RPD%		REC%	Range	Anlst	Date	Time
Ion Chromatography													
Batch 1635879													
QC1203719658 415150001 DUP													
Chloride			2530		2460	ug/Kg	3.07	^		(+/-2290)	MAR1	02/09/17	16:03
Fluoride		B	830	B	814	ug/Kg	1.95	^		(+/-1140)			
Nitrate-N		B	783	B	736	ug/Kg	6.17	^		(+/-1140)			
Nitrite-N		U	377	U	377	ug/Kg	N/A						
Phosphorus in phosphate		U	766	U	766	ug/Kg	N/A						
Sulfate			7490		6930	ug/Kg	7.71	^		(+/-4570)			
QC1203719657 LCS													
Chloride	50000				48500	ug/Kg			97.1	(80%-120%)		02/09/17	14:59
Fluoride	25000				24800	ug/Kg			99.2	(80%-120%)			
Nitrate-N	25000				24500	ug/Kg			97.9	(80%-120%)			
Nitrite-N	25000				24300	ug/Kg			97.3	(80%-120%)			
Phosphorus in phosphate	12500				13700	ug/Kg			109	(80%-120%)			
Sulfate	100000				98100	ug/Kg			98.1	(80%-120%)			
QC1203719656 MB													
Chloride				U	720	ug/Kg						02/09/17	14:27

GEL LABORATORIES LLC
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QC Summary

Workorder: **415150**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography											
Batch 1635879											
Fluoride				U	340	ug/Kg				MAR1	02/09/17 14:27
Nitrate-N				U	330	ug/Kg					
Nitrite-N				U	330	ug/Kg					
Phosphorus in phosphate				U	670	ug/Kg					
Sulfate				U	1330	ug/Kg					
QC1203719659 415150001 MS											
Chloride	57000		2530		55600	ug/Kg		93.1	(48%-145%)		02/09/17 16:35
Fluoride	28500	B	830		27000	ug/Kg		91.7	(30%-135%)		
Nitrate-N	28500	B	783		27200	ug/Kg		92.8	(70%-125%)		
Nitrite-N	28500	U	377		28100	ug/Kg		98.6	(70%-120%)		
Phosphorus in phosphate	14300	U	766		13300	ug/Kg		89.8	(35%-134%)		
Sulfate	114000		7490		116000	ug/Kg		95.3	(45%-162%)		
Titration and Ion Analysis											
Batch 1634765											
QC1203716728 415150001 DUP											
pH		X	8.65	X	8.69	SU	0.461		(0%-30%)	RXB5	01/27/17 17:43
QC1203716727 LCS											
pH	7.00				6.99	SU		99.9	(70%-130%)		01/27/17 17:40

Notes:

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QC Summary

Workorder: **415150**

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

The Qualifiers in this report are defined as follows:

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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL415150
Work Order #: 415150

Product: **AMCMISO_EIE_PRECIP_AEA: COMMON**
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1635302

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718266	Method Blank (MB)
1203718267	415150001(B36M10) Sample Duplicate (DUP)
1203718268	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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 1203718268 (LCS) was recounted due to high carrier/tracer yield. The recount is reported.

Product: **NP237_IE_PRECIP_AEA: COMMON**
Analytical Method: ASTM C 1475-00 Modified
Analytical Procedure: GL-RAD-A-032 REV# 21
Analytical Batch: 1635305

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718269	Method Blank (MB)
1203718270	415150001(B36M10) Sample Duplicate (DUP)
1203718271	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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: **PUISO_PRECIP_AEA:COMMON**
Analytical Method: PUISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1635307

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718272	Method Blank (MB)
1203718273	415150001(B36M10) Sample Duplicate (DUP)
1203718274	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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: **THISO_IE_PLATE_AEA: COMMON**
Analytical Method: THISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-038 REV# 17

Analytical Batch: 1635308

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718275	Method Blank (MB)
1203718276	415150001(B36M10) Sample Duplicate (DUP)
1203718277	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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: UISO_IE_PRECIP_AEA:COMMON
Analytical Method: UISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1635309

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718278	Method Blank (MB)
1203718279	415150001(B36M10) Sample Duplicate (DUP)
1203718280	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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 415150001 (B36M10) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

1. The U-232 tracer peak centroid for sample 415150001 is greater than 50 keV from the expected energy value of 5302 keV. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the U-232 region of interest. Reporting results.

Product: **Dry Weight**
Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203717112	415150001(B36M10) Sample Duplicate (DUP)

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

Data Summary:

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

Product: **GAMMA_GS:COMMON + (Add-on)**
Analytical Method: GAMMA_GS
Analytical Procedure: GL-RAD-A-013 REV# 25
Analytical Batch: 1635217

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718016	Method Blank (MB)
1203718017	415150001(B36M10) Sample Duplicate (DUP)
1203718018	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Data rejected due to high counting uncertainty.	Europium-155	415150001	B36M10

Product: I129_SEP_LEPS_GS
Analytical Method: I129_SEP_LEPS_GS
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1635249

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718103	Method Blank (MB)
1203718104	415150001(B36M10) Sample Duplicate (DUP)
1203718105	415150001(B36M10) Matrix Spike (MS)
1203718106	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: SRTOT_SEP_PRECIP_GPC: COMMON
Analytical Method: SRTOT_SEP_PRECIP_GPC
Analytical Procedure: GL-RAD-A-004 REV# 17
Analytical Batch: 1635085

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203717596	Method Blank (MB)
1203717597	415150001(B36M10) Sample Duplicate (DUP)
1203717598	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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: **TC99_SEP_GPC**
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 4
Analytical Batch: 1635477

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203718729	Method Blank (MB)
1203718730	415150001(B36M10) Sample Duplicate (DUP)
1203718731	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# 21
Analytical Batch: 1636812

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10

1203722046	Method Blank (MB)
1203722047	415150001(B36M10) Sample Duplicate (DUP)
1203722048	415150001(B36M10) Matrix Spike (MS)
1203722049	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: C14_LSC: COMMON
Analytical Method: C14_LSC
Analytical Procedure: GL-RAD-A-003 REV# 15
Analytical Batch: 1636853

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203722176	Method Blank (MB)
1203722177	415150001(B36M10) Sample Duplicate (DUP)
1203722178	415150001(B36M10) Matrix Spike (MS)
1203722179	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: NI63_LSC
Analytical Method: NI63_LSC
Analytical Procedure: GL-RAD-A-022 REV# 18
Analytical Batch: 1639089

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1634908

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

GEL Sample ID#	Client Sample Identification
415150001	B36M10
1203727697	Method Blank (MB)
1203727698	415150001(B36M10) Sample Duplicate (DUP)
1203727699	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

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

Quality Control (QC) Information

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203727698 (B36M10DUP) and 415150001 (B36M10), relative error ratio is greater than 2; however, both results are less than their respective MDCs.

Technical Information

Sample Re-prep/Re-analysis
Sample 415150001 (B36M10) was reprepped due to high recovery. The re-analysis is being 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.

GEL LABORATORIES LLC

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL415150 GEL Work Order: 415150

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.

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

Review/Validation

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

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

Signature: Theresa L. Austin **Name: Theresa Austin**

Date: 22 FEB 2017 **Title: Group Leader**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635302**	**Method:**	**AMCMISO_EIE_PREC_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**02/04/2017 11:47**	**Analyst:**	**KXB2**	**Instrument:**	**1079**
Data File:	**S0415150001_AM.1A.gcnf**	**Aliquot:**	**0.11 g**	**Count Time:**	**240 min**
Prep Batch:	**1635302**	**Prep Method:**	**DOE EML HASL-300, Am-05**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**01/31/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.00258	pCi/g	+/-0.192	0.192	0.426	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	18.1	19.4	pCi/g	93.4	(30%-105%)

Comments:

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

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:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635305**	**Method:**	**ASTM C 1475-00 Modified**	**SOP Ref:**	**GL-RAD-A-032**
Run Date:	**02/02/2017 09:39**	**Analyst:**	**KXB2**	**Instrument:**	**1167**
Data File:	**S0415150001_NP.1A.gcnf**	**Aliquot:**	**0.106 g**	**Count Time:**	**240 min**
Prep Batch:	**1635305**	**Prep Method:**	**ASTM C 1475-00 Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**01/31/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.107	pCi/g	+/-0.301	0.302	0.322	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1380	2020	pCi/g	68.2	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635307**	**Method:**	**PUISO_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**02/04/2017 12:10**	**Analyst:**	**KXB2**	**Instrument:**	**1072**
Data File:	**S0415150001_PU.1A.gcnf**	**Aliquot:**	**0.11 g**	**Count Time:**	**240 min**
Prep Batch:	**1635307**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**01/31/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	0.0338	pCi/g	+/-0.188	0.188	0.360	1.00
OER-100-70	Plutonium-239/240	U	0.0676	pCi/g	+/-0.231	0.231	0.428	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	14.8	17.9	pCi/g	82.6	(30%-105%)

Comments:

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**

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:	GEL415150	**Client:**	CPRC001	**Project:**	CPRC0F16028
Lab Sample ID:	415150001	**Date Collected:**	01/25/2017 13:30	**Matrix:**	SOIL
		Date Received:	01/27/2017 08:55	**%Moisture:**	12.5
Client ID:	B36M10			**Prep Basis:**	"Dry Weight Corrected"
Batch ID:	1635308	**Method:**	THISO_IE_PRECIP_AEA	**SOP Ref:**	GL-RAD-A-038
Run Date:	02/04/2017 11:41	**Analyst:**	KXB2	**Instrument:**	1033
Data File:	S0415150001_TH.1A.gcnf	**Aliquot:**	0.107 g	**Count Time:**	239.9998 min
Prep Batch:	1635308	**Prep Method:**	DOE EML HASL-300, Th-01-	**Prep SOP Ref:**	GL-RAD-A-021
Prep Date:	01/31/2017 00:00				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
TH-232 *7440-29-1*	Thorium-232		0.425	pCi/g	+/-0.344	0.349	0.256	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	16.9	19.3	pCi/g	87.3	(30%-105%)

Comments:

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635309**	**Method:**	**UISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**02/08/2017 16:13**	**Analyst:**	**KXB2**	**Instrument:**	**1115**
Data File:	**S0415150001_UU.1B.gcnf**	**Aliquot:**	**0.11 g**	**Count Time:**	**240 min**
Prep Batch:	**1635309**	**Prep Method:**	**DOE EML HASL-300, U-02-R**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**01/31/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 *13968-55-3/13966-29-5*	Uranium-233/234	U	0.229	pCi/g	+/-0.319	0.320	0.475	1.00
15117-96-1/13982-7	Uranium-235/236	U	-0.0572	pCi/g	+/-0.173	0.173	0.485	1.00
7440-61-1	Uranium-238	U	-0.0514	pCi/g	+/-0.314	0.314	0.709	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	20.0	19.0	pCi/g	105	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635085**	**Method:**	**SRTOT_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**02/03/2017 14:39**	**Analyst:**	**BXF1**	**Instrument:**	**PIC6A**
Data File:	**S1635085.xls**	**Aliquot:**	**0.52 g**	**Count Time:**	**60 min**
Prep Batch:	**1635085**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**02/01/2017 11:16**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium		2.69	pCi/g	+/-0.837	1.09	1.06	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	5.50	7.75	mg	71	(40%-110%)

Comments:

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1635217**	**Method:**	**GAMMA_GS**	**SOP Ref:**	**GL-RAD-A-013**
Run Date:	**02/20/2017 07:48**	**Analyst:**	**MXR1**	**Instrument:**	**GAM21**
Data File:	**G415150001.CNF;5**	**Aliquot:**	**136.698 g**	**Count Time:**	**720 min**
Prep Batch:	**1635217**	**Prep Method:**	**DOE HASL 300, 4.5.2.3/Ga-01**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**01/30/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	8.29E-06	pCi/g	+/-0.0143	0.0143	0.0205	0.100
10198-40-0	Cobalt-60	U	0.00305	pCi/g	+/-0.0127	0.0128	0.0232	0.100
14683-23-9	Europium-152	U	0.00718	pCi/g	+/-0.0218	0.0221	0.0383	0.100
15585-10-1	Europium-154	U	0.0389	pCi/g	+/-0.0417	0.0453	0.0791	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.0297	0.0298	0.0255	0.100
13982-63-3	Radium-226		0.329	pCi/g	+/-0.0536	0.0615	0.0313	1.00
15262-20-1	Radium-228		0.498	pCi/g	+/-0.0976	0.107	0.0729	3.00

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

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"As Received"**
Batch ID:	**1635249**	**Method:**	**I129_SEP_LEPS_GS**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**02/08/2017 14:22**	**Analyst:**	**MJH1**	**Instrument:**	**GAM05**
Data File:	**I415150001.CNF;1**	**Aliquot:**	**0.998 g**	**Count Time:**	**240 min**
Prep Batch:	**1635249**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**02/07/2017 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.232	pCi/g	+/-0.397	0.412	0.606	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"As Received"**
Batch ID:	**1635477**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**02/14/2017 06:37**	**Analyst:**	**LXT2**	**Instrument:**	**LSCRED**
Data File:	**E1635477.xls**	**Aliquot:**	**1.231 g**	**Count Time:**	**15 min**
Prep Batch:	**1635477**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**02/10/2017 10:17**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	1.98	pCi/g	+/-2.12	2.14	3.56	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	16400	17800	CPM	92.2	(30%-105%)

Comments:

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"As Received"**
Batch ID:	**1636812**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**02/11/2017 03:47**	**Analyst:**	**TXP3**	**Instrument:**	**LSCBLUE**
Data File:	**T1636812.xls**	**Aliquot:**	**2.12 g**	**Count Time:**	**15 min**
Prep Batch:	**1636812**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**02/10/2017 09:11**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-1.1	pCi/g	+/-8.35	8.35	15.3	30.0

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"As Received"**
Batch ID:	**1636853**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**02/11/2017 00:40**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCSILVER**
Data File:	**C1636853.xls**	**Aliquot:**	**0.511 g**	**Count Time:**	**45 min**
Prep Batch:	**1636853**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**02/10/2017 11:56**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-0.337	pCi/g	+/-2.17	2.17	3.74	5.00

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

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1639089**	**Method:**	**NI63_LSC**	**SOP Ref:**	**GL-RAD-A-022**
Run Date:	**02/15/2017 16:56**	**Analyst:**	**CXS7**	**Instrument:**	**LSCBLUE**
Data File:	**N1639089.xls**	**Aliquot:**	**0.551 g**	**Count Time:**	**30 min**
Prep Batch:	**1639089**	**Prep Method:**	**DOE RESL Ni-1, Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**02/14/2017 10:35**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-5.83	pCi/g	+/-4.70	4.70	8.42	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	15.7	24.6	mg	63.9	(40%-110%)

Comments:

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**

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

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Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL415150**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**415150001**	**Date Collected:**	**01/25/2017 13:30**	**Matrix:**	**SOIL**
		Date Received:	**01/27/2017 08:55**	**%Moisture:**	**12.5**
Client ID:	**B36M10**			**Prep Basis:**	**"As Received"**
Batch ID:	**1634908**	**Method:**	**ASTM D 2216 (Modified)**	**SOP Ref:**	**GL-OA-E-020**
Run Date:	**01/27/2017 15:25**	**Analyst:**	**MPK1**	**Instrument:**	**SP-39020004**
Data File:				**Count Time:**	
Prep Batch:	**1634908**				
Prep Date:	**01/27/2017 15:25**				

CAS No.	Parmname	Qual	Result	Units	MDC		
%MOISTURE	Moisture		12.5	percent	+/-		

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.
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Quality Control Summary

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

QC Summary

Report Date: February 22, 2017
Page 1 of 7

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

Workorder: **415150**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1635302									
QC1203718266 MB									
Americium-241			U	-0.0101	pCi/g			KXB2	02/04/1711:47
	Uncert:			+/-0.234					
	TPU:			+/-0.234					
**Americium-243 Tracer	19.4			16.3	pCi/g	REC: 84	(30%-105%)		
	Uncert:			+/-2.17					
	TPU:			+/-3.33					
QC1203718267 415150001 DUP									
Americium-241	U	0.00258	U	0.0206	pCi/g				02/04/1711:47
	Uncert:	+/-0.192		+/-0.235		RPD: 0	N/A		
	TPU:	+/-0.192		+/-0.235		RER: 0.116	(0-2)		
**Americium-243 Tracer	21.2	18.1		21.0	pCi/g	REC: 99	(30%-105%)		
	Uncert:	+/-2.19		+/-2.28					
	TPU:	+/-3.36		+/-3.53					
QC1203718268 LCS									
Americium-241	17.9			15.5	pCi/g	REC: 87	(80%-120%)		02/08/1715:08
	Uncert:			+/-2.02					
	TPU:			+/-2.90					
**Americium-243 Tracer	19.4			18.4	pCi/g	REC: 95	(30%-105%)		
	Uncert:			+/-2.25					
	TPU:			+/-3.44					
Batch 1635305									
QC1203718269 MB									
Neptunium-237			U	0.0744	pCi/g			KXB2	02/02/1709:39
	Uncert:			+/-0.287					
	TPU:			+/-0.287					
**Americium-243 Tracer	2020			2030	pCi/g	REC: 100	(30%-105%)		
QC1203718270 415150001 DUP									
Neptunium-237	U	0.107	U	0.00547	pCi/g				02/02/1709:39
	Uncert:	+/-0.301		+/-0.251		RPD: 0	N/A		
	TPU:	+/-0.302		+/-0.251		RER: 0.508	(0-2)		
**Americium-243 Tracer	2080	1380		2120	pCi/g	REC: 102	(30%-105%)		
QC1203718271 LCS									
Neptunium-237	42.1			41.8	pCi/g	REC: 99	(80%-120%)		02/02/1709:40
	Uncert:			+/-3.24					
	TPU:			+/-5.61					
**Americium-243 Tracer	2020			2110	pCi/g	REC: 104	(30%-105%)		
Batch 1635307									
QC1203718272 MB									
Plutonium-238			U	-0.0371	pCi/g			KXB2	02/04/1712:10
	Uncert:			+/-0.164					
	TPU:			+/-0.164					
Plutonium-239/240			U	-0.0185	pCi/g				
	Uncert:			+/-0.160					

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

QC Summary

Workorder: 415150

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1635307									
TPU:				+/-0.160					
**Plutonium-242 Tracer	17.9			14.7	pCi/g	REC: 82	(30%-105%)		
Uncert:				+/-2.32					
TPU:				+/-3.44					
QC1203718273 415150001 DUP									
Plutonium-238	U	0.0338	U	0.00503	pCi/g				02/04/1711:47
Uncert:		+/-0.188		+/-0.231		RPD: 0	N/A		
TPU:		+/-0.188		+/-0.231		RER: 0.189	(0-2)		
Plutonium-239/240	U	0.0676	U	-0.0453	pCi/g				
Uncert:		+/-0.231		+/-0.137		RPD: 0	N/A		
TPU:		+/-0.231		+/-0.137		RER: 0.823	(0-2)		
**Plutonium-242 Tracer	19.5	14.8		17.2	pCi/g	REC: 88	(30%-105%)		
Uncert:		+/-2.13		+/-2.18					
TPU:		+/-3.18		+/-3.29					
QC1203718274 LCS									
Plutonium-238			U	0.190	pCi/g				
Uncert:				+/-0.285					
TPU:				+/-0.286					
Plutonium-239/240	18.0			17.2	pCi/g	REC: 96	(80%-120%)		
Uncert:				+/-1.95					
TPU:				+/-2.90					
**Plutonium-242 Tracer	17.9			17.4	pCi/g	REC: 97	(30%-105%)		
Uncert:				+/-1.99					
TPU:				+/-3.00					
Batch 1635308									
QC1203718275 MB									
Thorium-232			U	0.243	pCi/g			KXB2	02/04/1711:41
Uncert:				+/-0.296					
TPU:				+/-0.298					
**Thorium-229 Tracer	19.3			16.1	pCi/g	REC: 83	(30%-105%)		
Uncert:				+/-2.24					
TPU:				+/-3.60					
QC1203718276 415150001 DUP									
Thorium-232		0.425	U	0.314	pCi/g				
Uncert:		+/-0.344		+/-0.321		RPD: 10	(0% - 100%)		
TPU:		+/-0.349		+/-0.324		RER: 0.456	(0-2)		
**Thorium-229 Tracer	20.5	16.9		20.0	pCi/g	REC: 97	(30%-105%)		
Uncert:		+/-2.16		+/-2.22					
TPU:		+/-3.50		+/-3.63					
QC1203718277 LCS									
Thorium-232	18.6			17.8	pCi/g	REC: 96	(80%-120%)		02/04/1711:41
Uncert:				+/-1.83					
TPU:				+/-2.99					
**Thorium-229 Tracer	19.3			19.5	pCi/g	REC: 101	(30%-105%)		
Uncert:				+/-1.91					
TPU:				+/-3.21					
Batch 1635309									
QC1203718278 MB									
Uranium-233/234			U	0.0217	pCi/g			KXB2	02/04/1711:13
Uncert:				+/-0.248					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1635309									
	TPU:			+/-0.248					
Uranium-235/236			U	0.0437	pCi/g				
	Uncert:			+/-0.243					
	TPU:			+/-0.243					
Uranium-238			U	-0.0136	pCi/g				
	Uncert:			+/-0.204					
	TPU:			+/-0.204					
**Uranium-232 Tracer	19.0			16.5	pCi/g	REC: 87	(30%-105%)		
	Uncert:			+/-2.27					
	TPU:			+/-3.51					
QC1203718279 415150001 DUP									
Uranium-233/234	U	0.229	U	0.129	pCi/g				02/04/1711:13
	Uncert:	+/-0.319		+/-0.254		RPD: 0	N/A		
	TPU:	+/-0.320		+/-0.255		RER: 0.476	(0-2)		
Uranium-235/236	U	-0.0572	U	0.00	pCi/g				
	Uncert:	+/-0.173		+/-0.183		RPD: 0	N/A		
	TPU:	+/-0.173		+/-0.184		RER: 0.444	(0-2)		
Uranium-238	U	-0.0514	U	0.332	pCi/g				
	Uncert:	+/-0.314		+/-0.358		RPD: 0	N/A		
	TPU:	+/-0.314		+/-0.361		RER: 1.57	(0-2)		
**Uranium-232 Tracer	20.7	20.0		19.8	pCi/g	REC: 96	(30%-105%)		
	Uncert:	+/-2.18		+/-2.43					
	TPU:	+/-3.39		+/-3.78					
QC1203718280 LCS									
Uranium-233/234				22.0	pCi/g				02/04/1711:13
	Uncert:			+/-2.14					
	TPU:			+/-3.55					
Uranium-235/236				1.00	pCi/g				
	Uncert:			+/-0.525					
	TPU:			+/-0.540					
Uranium-238	24.5			24.7	pCi/g	REC: 101	(80%-120%)		
	Uncert:			+/-2.27					
	TPU:			+/-3.91					
**Uranium-232 Tracer	19.0			18.9	pCi/g	REC: 100	(30%-105%)		
	Uncert:			+/-1.99					
	TPU:			+/-3.16					
Rad Gamma Spec									
Batch 1635217									
QC1203718016 MB									
Cesium-137			U	-0.0145	pCi/g			MXR1	02/20/1707:48
	Uncert:			+/-0.0119					
	TPU:			+/-0.0136					
Cobalt-60			U	0.00232	pCi/g				
	Uncert:			+/-0.0109					
	TPU:			+/-0.011					
Europium-152			U	-0.00959	pCi/g				
	Uncert:			+/-0.0275					
	TPU:			+/-0.0278					
Europium-154			U	0.0315	pCi/g				
	Uncert:			+/-0.0737					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1635217									
	TPU:			+/-0.0751					
Europium-155			U	-0.00585	pCi/g				
	Uncert:			+/-0.0196					
	TPU:			+/-0.0197					
Radium-226			U	-0.00801	pCi/g				
	Uncert:			+/-0.0341					
	TPU:			+/-0.0343					
Radium-228			U	0.0311	pCi/g				
	Uncert:			+/-0.061					
	TPU:			+/-0.0626					
QC1203718017 415150001 DUP									
Cesium-137	U	8.29E-06	U	-0.00226	pCi/g				02/20/1715:10
	Uncert:	+/-0.0143		+/-0.0115		RPD: 0	N/A		
	TPU:	+/-0.0143		+/-0.0115		RER: 0.48	(0-2)		
Cobalt-60	U	0.00305	U	-0.00379	pCi/g				
	Uncert:	+/-0.0127		+/-0.013		RPD: 0	N/A		
	TPU:	+/-0.0128		+/-0.0131		RER: 0.79	(0-2)		
Europium-152	U	0.00718	U	-0.007	pCi/g				
	Uncert:	+/-0.0218		+/-0.0252		RPD: 0	N/A		
	TPU:	+/-0.0221		+/-0.0254		RER: 0.937	(0-2)		
Europium-154	U	0.0389	U	0.0156	pCi/g				
	Uncert:	+/-0.0417		+/-0.0387		RPD: 0	N/A		
	TPU:	+/-0.0453		+/-0.0393		RER: 1.45	(0-2)		
Europium-155	UX	0.00	U	0.0214	pCi/g				
	Uncert:	+/-0.0297		+/-0.0228		RPD: 0	N/A		
	TPU:	+/-0.0298		+/-0.0248		RER: 0.567	(0-2)		
Radium-226		0.329		0.330	pCi/g				
	Uncert:	+/-0.0536		+/-0.0564		RPD: 11	(0% - 20%)		
	TPU:	+/-0.0615		+/-0.0582		RER: 0.607	(0-2)		
Radium-228		0.498		0.538	pCi/g				
	Uncert:	+/-0.0976		+/-0.106		RPD: 6	(0% - 20%)		
	TPU:	+/-0.107		+/-0.110		RER: 0.308	(0-2)		
QC1203718018 LCS									
Americium-241	489			520	pCi/g	REC: 106	(80%-120%)		02/20/1708:52
	Uncert:			+/-7.19					
	TPU:			+/-38.8					
Cesium-137	178			185	pCi/g	REC: 104	(80%-120%)		
	Uncert:			+/-3.13					
	TPU:			+/-8.51					
Cobalt-60	154			149	pCi/g	REC: 97	(80%-120%)		
	Uncert:			+/-3.22					
	TPU:			+/-6.36					
Europium-152			U	0.102	pCi/g				
	Uncert:			+/-1.23					
	TPU:			+/-1.23					
Europium-154			U	-0.339	pCi/g				
	Uncert:			+/-0.784					
	TPU:			+/-0.799					
Europium-155			U	0.225	pCi/g				
	Uncert:			+/-1.03					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1635217									
	TPU:			+/-1.03					
Radium-226			U	-0.279	pCi/g				
	Uncert:			+/-0.929					
	TPU:			+/-0.937					
Radium-228			U	-3.79	pCi/g				
	Uncert:			+/-2.65					
	TPU:			+/-3.15					
Batch 1635249									
QC1203718103 MB									
Iodine-129			U	0.142	pCi/g			MJH1	02/08/1714:22
	Uncert:			+/-0.274					
	TPU:			+/-0.282					
QC1203718104 415150001 DUP									
Iodine-129	U	-0.232	U	0.0233	pCi/g				02/08/1714:23
	Uncert:	+/-0.397		+/-0.235		RPD: 0	N/A		
	TPU:	+/-0.412		+/-0.235		RER: 1.05	(0-2)		
QC1203718105 415150001 MS									
Iodine-129	41.7 U	-0.232		37.8	pCi/g	REC: 91	(75%-125%)		02/08/1714:23
	Uncert:	+/-0.397		+/-2.21					
	TPU:	+/-0.412		+/-4.37					
QC1203718106 LCS									
Iodine-129	41.7			41.5	pCi/g	REC: 100	(80%-120%)		02/08/1714:24
	Uncert:			+/-2.24					
	TPU:			+/-4.75					
Rad Gas Flow									
Batch 1635085									
QC1203717596 MB									
Total Strontium			U	0.935	pCi/g			BXF1	02/03/1714:39
	Uncert:			+/-0.682					
	TPU:			+/-0.724					
**Strontium Carrier	7.75			6.80	mg	REC: 88	(40%-110%)		
QC1203717597 415150001 DUP									
Total Strontium		2.69		2.77	pCi/g				02/03/1714:39
	Uncert:	+/-0.837		+/-0.929		RPD: 3	(0% - 100%)		
	TPU:	+/-1.09		+/-1.17		RER: 0.103	(0-2)		
**Strontium Carrier	7.75	5.50		4.80	mg	REC: 62	(40%-110%)		
QC1203717598 LCS									
Total Strontium	42.4			44.8	pCi/g	REC: 106	(80%-120%)		02/03/1714:39
	Uncert:			+/-2.23					
	TPU:			+/-11.7					
**Strontium Carrier	7.75			7.30	mg	REC: 94	(40%-110%)		
Rad Liquid Scintillation									
Batch 1635477									
QC1203718729 MB									
Technetium-99			U	1.22	pCi/g			LXT2	02/14/1707:10
	Uncert:			+/-1.99					
	TPU:			+/-2.00					
**Technetium-99m Tracer	17800			16800	CPM	REC: 94	(30%-105%)		
QC1203718730 415150001 DUP									

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1635477									
Technetium-99	U	1.98	U	2.77	pCi/g				
Uncert:		+/-2.12		+/-2.06		RPD:	0	N/A	
TPU:		+/-2.14		+/-2.08		RER:	0.522	(0-2)	
**Technetium-99m Tracer	17800	16400		16900	CPM	REC:	95	(30%-105%)	
QC1203718731 LCS									
Technetium-99	68.3			66.1	pCi/g	REC:	97	(80%-120%)	02/14/1707:43
Uncert:				+/-3.85					
TPU:				+/-8.52					
**Technetium-99m Tracer	17800			17100	CPM	REC:	96	(30%-105%)	
Batch 1636812									
QC1203722046 MB									
Tritium			U	-5.48	pCi/g			TXP3	02/11/1704:20
Uncert:				+/-7.75					
TPU:				+/-7.75					
QC1203722047 415150001 DUP									
Tritium	U	-1.1	U	3.00	pCi/g				02/11/1704:37
Uncert:		+/-8.35		+/-8.72		RPD:	0	N/A	
TPU:		+/-8.35		+/-8.74		RER:	0.666	(0-2)	
QC1203722048 415150001 MS									
Tritium	55.8 U	-1.1		51.1	pCi/g	REC:	92	(75%-125%)	02/11/1704:53
Uncert:		+/-8.35		+/-12.2					
TPU:		+/-8.35		+/-16.8					
QC1203722049 LCS									
Tritium	53.8			45.7	pCi/g	REC:	85	(80%-120%)	02/11/1705:09
Uncert:				+/-11.5					
TPU:				+/-15.5					
Batch 1636853									
QC1203722176 MB									
Carbon-14			U	-1.53	pCi/g			TXJ1	02/11/1703:30
Uncert:				+/-2.14					
TPU:				+/-2.14					
QC1203722177 415150001 DUP									
Carbon-14	U	-0.337	U	1.42	pCi/g				02/11/1704:17
Uncert:		+/-2.17		+/-2.20		RPD:	0	N/A	
TPU:		+/-2.17		+/-2.20		RER:	1.11	(0-2)	
QC1203722178 415150001 MS									
Carbon-14	149 U	-0.337		140	pCi/g	REC:	94	(75%-125%)	02/11/1705:04
Uncert:		+/-2.17		+/-4.42					
TPU:		+/-2.17		+/-11.2					
QC1203722179 LCS									
Carbon-14	145			140	pCi/g	REC:	97	(80%-120%)	02/11/1705:51
Uncert:				+/-4.36					
TPU:				+/-11.2					
Batch 1639089									
QC1203727697 MB									
Nickel-63			U	-4.29	pCi/g			CXS7	02/15/1718:32
Uncert:				+/-4.01					
TPU:				+/-4.01					
**Nickel Carrier	24.6			15.3	mg	REC:	62	(40%-110%)	
QC1203727698 415150001 DUP									

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1639089									
Nickel-63	U	-5.83	U	3.15	pCi/g				
	Uncert:	+/-4.70		+/-4.72		RPD:	0	N/A	
	TPU:	+/-4.70		+/-4.76		RER:	2.63	(0-2)	
**Nickel Carrier	24.6	15.7		17.2	mg	REC:	70	(40%-110%)	
QC1203727699 LCS									
Nickel-63	204			198	pCi/g	REC:	97	(80%-120%)	02/15/1719:37
	Uncert:			+/-8.03					
	TPU:			+/-37.4					
**Nickel Carrier	24.6			16.1	mg	REC:	66	(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:

*	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
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.
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.
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

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 acceptence 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.