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
F 843.766.1178

gel.com

December 28, 2016

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

Re: CHPRC SAF F16-028
Work Order: 411673
SDG: GEL411673

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 02, 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: 300192 - 8H
Chain of Custody: F16-028-063
Enclosures

Table of Contents

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-028
SDG: GEL411673

December 28, 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 December 02, 2016, 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
411673001	B36M08

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 #: GEL411673
Work Order #: 411673

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	411673
	001
Uranium	2X

General Chemistry

Ion Chromatography

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.

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

1203696449 (B36M02DUP)	pH	Received 01-DEC-16, out of holding 29-NOV-16
411673001 (B36M08)	pH	Received 02-DEC-16, out of holding 30-NOV-16

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 1203682866 (LCS) was recounted due to a peak shift. The recount is reported. Sample 1203682864 (MB) was recounted due to detector error. The recount is reported.

NP237_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
The tracer yield portion of sample 1203682867 (MB) was recounted due to a high tracer yield recovery. The recount is being reported.

PUISO_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 1203682872 (LCS) was recounted due to high recovery. The recount is reported. Sample 411673001 (B36M08) was recounted due to a peak shift. The recount is reported.

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.

Quality Control (QC) Information

QC Information
Refer to Miscellaneous Information section.

Technical Information

Recounts
Sample 1203682876 (MB) was recounted due to a suspected blank 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

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

Technical Information

Sample Re-prep/Re-analysis
Samples were reprepped due to high blank activity. The re-analysis is being reported.

Recounts
Sample 1203691786 (Non SDG 412279003DUP) was recounted due to a suspected false positive. The recount is reported.

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.

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 1203686850 (Non SDG 412139001MS) was recounted due to low recovery. The recount is reported.

TC99_SEP_GPC

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 1203686928 (LCS) was recounted due to low recovery. The recount is reported.

NI63_LSC

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

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-028-063	PAGE 1 OF 2
COLLECTOR Curt Hoffman CHPRC	**COMPANY CONTACT** TODAK, D	**TELEPHONE NO.** 376-6427	**PROJECT COORDINATOR** TODAK, D	**PRICE CODE** 8H	**DATA TURNAROUND**
SAMPLING LOCATION C9567, I-004	**PROJECT DESIGNATION** 200-WA-1 Opportunistic sampling - soil		**SAF NO.** F16-028	**AIR QUALITY** ☐	**30 Days / 30 Days**
ICE CHEST NO. GWS-619	**FIELD LOGBOOK NO.** HNF-N-645-4 pg 54	**ACTUAL SAMPLE DEPTH** 175.2	**COA** 300192	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 7319		**BILL OF LADING/AIR BILL NO.** 7778 4181 5809		

411673

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**						
B36M08	SOIL	11-30-16	0741	✓	✓	✓	✓	✓	

12/29/2016

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM Curt Hoffman CHPRC	**DATE/TIME** NOV 30 2016 1450	**RECEIVED BY/STORED IN** SSU-1	**DATE/TIME** NOV 30 2016 1450	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM SSU-1	**DATE/TIME** DEC 01 2016 0805	**RECEIVED BY/STORED IN** Lesly Wall /CHPRC	**DATE/TIME** DEC 01 2016 0805	
RELINQUISHED BY/REMOVED FROM Lesly Wall /CHPRC	**DATE/TIME** DEC 01 2016 1400	**RECEIVED BY/STORED IN** FEDEX	**DATE/TIME**	
RELINQUISHED BY/REMOVED FROM FED EX	**DATE/TIME**	**RECEIVED BY/STORED IN** P. Nelson Paterson Dentrol	**DATE/TIME** 12/2/16 0930	
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**	

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 8/11/2016 **FSR ID = FSR20231** **TRVL NUM = TRVL-16-060** A-6003-618 (REV 2)

REV.0

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-028-063	PAGE 2 OF 2
COLLECTOR Curt Hoffman 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-004	**PROJECT DESIGNATION** 200-WA-1 Opportunistic sampling - soil		**SAF NO.** F16-028	**AIR QUALITY** ☐	
ICE CHEST NO. GWS-619	**FIELD LOGBOOK NO.** HNF-N-645-4 pg 54	**ACTUAL SAMPLE DEPTH** 175.2	**COA** 300192	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 7319		**BILL OF LADING/AIR BILL NO.** 7778 4181 5809		

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: CARC	SDG/AR/COC/Work Order: 411673
Received By: P. Arent	Date Received: 12/2/16

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): 0 cpm
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): 201404337
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: 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 7778 4181 5809

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials CS Date 12/2/16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

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

Report Date: 28−DEC−16

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 28 December 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	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	T104704235−16−11
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 #: GEL411673
Work Order #: 411673

Product: **Determination of Metals by ICP-MS**
Analytical Method: SW846 3050B/6020B
Analytical Procedure: GL-MA-E-014 REV# 28
Analytical Batch: 1621082

Preparation Method: SW846 3050B
Preparation Procedure: GL-MA-E-009 REV# 26
Preparation Batch: 1621081

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682667	Method Blank (MB)**ICP-MS**
1203682668	Laboratory Control Sample (LCS)
1203682671	411673001(B36M08L) Serial Dilution (SD)
1203682669	411673001(B36M08D) Sample Duplicate (DUP)
1203682670	411673001(B36M08S) 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	411673 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: GEL411673 GEL Work Order: 411673

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature:  **Name: Nik-Cole Elmore**

Date: 28 DEC 2016 **Title: Data Validator**

Sample Data Summary

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL411673 **CONTRACT:** CPRC0F16028 **METHOD TYPE:** SW846

SAMPLE ID: 411673001 **BASIS:** Dry Weight **DATE COLLECTED** 30−NOV−16

CLIENT ID: B36M08 **LEVEL:** Low **DATE RECEIVED** 02−DEC−16

MATRIX: SOIL **%SOLIDS:** 95.6

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−61−1	Uranium	691	ug/kg	D	13.7	41.5	41.5	2	MS	SKJ	12/16/16 12:06	161216−1	1621082

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1621082	1621081	SW846 3050B	0.504	g	50	mL	12/02/16	CXW4

***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: December 29, 2016

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **411673**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS												
Batch 1621082												
QC1203682669 411673001 DUP												
Uranium		D	691	D	594	ug/kg	15.2		(0%-20%)	SKJ	12/16/16	12:07
QC1203682668 LCS												
Uranium	4600			D	4900	ug/kg		106	(80%-120%)		12/16/16	12:04
QC1203682667 MB												
Uranium				DU	12.2	ug/kg					12/16/16	12:03
QC1203682670 411673001 MS												
Uranium	4970	D	691	D	6220	ug/kg		111	(75%-125%)		12/16/16	12:09
QC1203682671 411673001 SDILT												
Uranium		D	3.33	D	0.972	ug/L	45.9		(0%-20%)		12/16/16	12:10

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 concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

QC Summary

Workorder: **411673**

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

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

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

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL411673
Work Order #: 411673

Product: **Ion Chromatography**
Analytical Method: 9056_ANIONS_IC
Analytical Procedure: GL-GC-E-086 REV# 25
Analytical Batches: 1621744 and 1621743

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203684228	Method Blank (MB)
1203684229	Laboratory Control Sample (LCS)
1203684230	410876001(B35XW2) Sample Duplicate (DUP)
1203684915	410876001(B35XW2) Matrix Spike (MS)

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: **pH**
Analytical Method: SW846 9045D
Analytical Procedure: GL-GC-E-008 REV# 22
Analytical Batch: 1626618

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203696447	Laboratory Control Sample (LCS)
1203696449	411604001(B36M02) 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
1203696449 (B36M02DUP)	pH	Received 01-DEC-16, out of holding 29-NOV-16
411673001 (B36M08)	pH	Received 02-DEC-16, out of holding 30-NOV-16

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: GEL411673 GEL Work Order: 411673

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: 22 DEC 2016 **Title: Analyst I**

Sample Data Summary

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

Certificate of Analysis

Report Date: December 22, 2016

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: B36M08
Sample ID: 411673001
Matrix: SOIL
Collect Date: 30-NOV-16 07:41
Receive Date: 02-DEC-16
Collector: Client
Moisture: 4.44%

Project: CPRC0F16028
Client ID: CPRC001

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	B	1770	730	2030	ug/Kg	9.69	1	MXL2	12/07/16	0316	1621744	1
Fluoride	B	846	345	1010	ug/Kg	9.69	1					
Nitrate-N	B	571	334	1010	ug/Kg	9.69	1					
Nitrite-N	U	334	334	1010	ug/Kg	9.69	1					
Phosphorus in phosphate	U	679	679	2030	ug/Kg	9.69	1					
Sulfate		5160	1350	4050	ug/Kg	9.69	1					
Titration and Ion Analysis												
9045_pH (Non-Aqueous):COMMON "As Received"												
pH at Temp 22.4C	X	9.03	0.010	0.100	SU		1	RXB5	12/22/16	1000	1626618	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9056A	SW846 9056A Total Anions in Soil	MXL2	12/06/16	1532	1621743

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: December 22, 2016

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **411673**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography												
Batch 1621744												
QC1203684230 410876001 DUP												
Chloride			6700		6610	ug/Kg	1.31 ^		(+/-2020)	MXL2	12/06/16	22:27
Fluoride		B	889	B	678	ug/Kg	26.9 ^		(+/-1010)			
Nitrate-N			2030		2060	ug/Kg	1.57 ^		(+/-1010)			
Nitrite-N		U	332	U	334	ug/Kg	N/A					
Phosphorus in phosphate		U	674	U	677	ug/Kg	N/A					
Sulfate			5630		5960	ug/Kg	5.76 ^		(+/-4040)			
QC1203684229 LCS												
Chloride	49900				48600	ug/Kg		97.5	(80%-120%)		12/06/16	21:29
Fluoride	24900				25500	ug/Kg		102	(80%-120%)			
Nitrate-N	24900				24100	ug/Kg		96.8	(80%-120%)			
Nitrite-N	24900				24600	ug/Kg		98.5	(80%-120%)			
Phosphorus in phosphate	12500				12600	ug/Kg		101	(80%-120%)			
Sulfate	99800				98100	ug/Kg		98.4	(80%-120%)			
QC1203684228 MB												
Chloride				U	715	ug/Kg					12/06/16	21:00
Fluoride				U	337	ug/Kg						
Nitrate-N				U	328	ug/Kg						
Nitrite-N				U	328	ug/Kg						
Phosphorus in phosphate				U	665	ug/Kg						
Sulfate				U	1320	ug/Kg						
QC1203684915 410876001 MS												

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

QC Summary

Workorder: **411673**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography											
Batch 1621744											
Chloride	50200		6700		54800	ug/Kg		95.8	(48%-145%)		12/06/16 22:56
Fluoride	25100	B	889		24800	ug/Kg		95.5	(30%-135%)	MXL2	
Nitrate-N	25100		2030		25400	ug/Kg		93.2	(70%-125%)		
Nitrite-N	25100	U	332		24600	ug/Kg		98.1	(70%-120%)		
Phosphorus in phosphate	12500	U	674		11500	ug/Kg		91.6	(35%-134%)		
Sulfate	100000		5630		103000	ug/Kg		97.2	(45%-162%)		
Titration and Ion Analysis											
Batch 1626618											
QC1203696449 411604001 DUP											
pH		X	8.71	X	8.70	SU	0.115		(0%-30%)	RXB5	12/22/16 09:55
QC1203696447 LCS											
pH	7.00				6.98	SU		99.7	(70%-130%)		12/22/16 09:54

Notes:

The Qualifiers in this report are defined as follows:

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL411673
Work Order #: 411673

Product: **AMCMISO_EIE_PRECIP_AEA: COMMON**
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1621162

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682864	Method Blank (MB)
1203682865	411673001(B36M08) Sample Duplicate (DUP)
1203682866	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 1203682866 (LCS) was recounted due to a peak shift. The recount is reported. Sample 1203682864 (MB) was recounted due to detector error. 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: 1621163

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682867	Method Blank (MB)
1203682868	411673001(B36M08) Sample Duplicate (DUP)
1203682869	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
The tracer yield portion of sample 1203682867 (MB) was recounted due to a high tracer yield recovery. The recount is being reported.

Product: **PUISO_PRECIP_AEA:COMMON**
Analytical Method: PUISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1621164

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682870	Method Blank (MB)
1203682871	411673001(B36M08) Sample Duplicate (DUP)
1203682872	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 1203682872 (LCS) was recounted due to high recovery. The recount is reported. Sample 411673001 (B36M08) was recounted due to a peak shift. The recount is reported.

Product: **THISO_IE_PLATE_AEA: COMMON**
Analytical Method: THISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-038 REV# 17
Analytical Batch: 1621165

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682873	Method Blank (MB)
1203682874	411673001(B36M08) Sample Duplicate (DUP)
1203682875	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: 1621166

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682876	Method Blank (MB)
1203682877	411673001(B36M08) Sample Duplicate (DUP)
1203682878	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: Refer to Miscellaneous Information section.

Technical Information

Recounts
Sample 1203682876 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information

1. The U-232 tracer peak for the Method blank 1203682876 is greater than 50 kev from the expected energy of 5302 keV. 1. The tracer peak is within the U-232 ROI and the tracer yield recovery does meet the client acceptance criteria. Reporting results.

Product: **Dry Weight**
Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682409	411673001(B36M08) 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: 1620997

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203682482	Method Blank (MB)
1203682483	411604001(B36M02) Sample Duplicate (DUP)
1203682484	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	411673001	B36M08
X	Data rejected due to low abundance.	Radium-228	411673001	B36M08

Product: I129_SEP_LEPS_GS
Analytical Method: I129_SEP_LEPS_GS
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1621232

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203683043	Method Blank (MB)
1203683044	411604001(B36M02) Sample Duplicate (DUP)
1203683045	411604001(B36M02) Matrix Spike (MS)
1203683046	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: 1624847

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203691785	Method Blank (MB)
1203691786	412279003(NonSDG) Sample Duplicate (DUP)
1203691787	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

Sample Re-prep/Re-analysis
Samples were reprepped due to high blank activity. The re-analysis is being reported.

Recounts
Sample 1203691786 (Non SDG 412279003DUP) was recounted due to a suspected false positive. The recount is reported.

Product: **C14_LSC: COMMON**
Analytical Method: C14_LSC
Analytical Procedure: GL-RAD-A-003 REV# 15
Analytical Batch: 1621925

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203684717	Method Blank (MB)
1203684718	411604001(B36M02) Sample Duplicate (DUP)
1203684719	411604001(B36M02) Matrix Spike (MS)
1203684720	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: 1622764

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203686848	Method Blank (MB)
1203686849	412139001(NonSDG) Sample Duplicate (DUP)
1203686850	412139001(NonSDG) Matrix Spike (MS)
1203686851	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 1203686850 (Non SDG 412139001MS) was recounted due to low recovery. The recount is reported.

Product: **TC99_SEP_GPC**
Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 4
Analytical Batch: 1622796

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203686926	Method Blank (MB)
1203686927	411604001(B36M02) Sample Duplicate (DUP)
1203686928	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 1203686928 (LCS) was recounted due to low recovery. The recount is reported.

Product: **NI63_LSC**
Analytical Method: NI63_LSC
Analytical Procedure: GL-RAD-A-022 REV# 18
Analytical Batch: 1622800

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1620979

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

GEL Sample ID#	Client Sample Identification
411673001	B36M08
1203686939	Method Blank (MB)
1203686940	411604001(B36M02) Sample Duplicate (DUP)
1203686941	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.

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: GEL411673 GEL Work Order: 411673

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:  **Name: Kate Gellatly**

Date: 29 DEC 2016 **Title: Analyst I**

Sample Data Summary

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1621162**	**Method:**	**AMCMISO_EIE_PREC_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**12/16/2016 10:20**	**Analyst:**	**JXH2**	**Instrument:**	**1239**
Data File:	**S0411673001_AM.1A.gcnf**	**Aliquot:**	**0.115 g**	**Count Time:**	**240 min**
Prep Batch:	**1621162**	**Prep Method:**	**DOE EML HASL-300, Am-05**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/14/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	-0.0672	pCi/g	+/-0.156	0.156	0.461	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	18.6	18.6	pCi/g	100	(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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1621163**	**Method:**	**ASTM C 1475-00 Modified**	**SOP Ref:**	**GL-RAD-A-032**
Run Date:	**12/16/2016 09:24**	**Analyst:**	**JXH2**	**Instrument:**	**1199**
Data File:	**S0411673001_NP.1A.gcnf**	**Aliquot:**	**0.11 g**	**Count Time:**	**240 min**
Prep Batch:	**1621163**	**Prep Method:**	**ASTM C 1475-00 Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/14/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0311	pCi/g	+/-0.138	0.138	0.359	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1970	1940	pCi/g	101	(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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1621164**	**Method:**	**PUISO_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**12/27/2016 19:37**	**Analyst:**	**JXH2**	**Instrument:**	**1069**
Data File:	**S0411673001_PU.2A.gcnf**	**Aliquot:**	**0.115 g**	**Count Time:**	**240 min**
Prep Batch:	**1621164**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/14/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	-0.0122	pCi/g	+/-0.183	0.184	0.429	1.00
OER-100-70	Plutonium-239/240	U	0.0171	pCi/g	+/-0.179	0.179	0.373	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	14.0	17.2	pCi/g	81.3	(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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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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1621165**	**Method:**	**THISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-038**
Run Date:	**12/17/2016 11:21**	**Analyst:**	**JXH2**	**Instrument:**	**1026**
Data File:	**S0411673001_TH.1A.gcnf**	**Aliquot:**	**0.102 g**	**Count Time:**	**240 min**
Prep Batch:	**1621165**	**Prep Method:**	**DOE EML HASL-300, Th-01-**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/14/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
TH-232 *7440-29-1*	Thorium-232		0.823	pCi/g	+/-0.468	0.482	0.402	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	19.2	20.3	pCi/g	94.6	(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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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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1621166**	**Method:**	**UISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**12/17/2016 11:15**	**Analyst:**	**JXH2**	**Instrument:**	**1147**
Data File:	**S0411673001_UU.1A.gcnf**	**Aliquot:**	**0.115 g**	**Count Time:**	**240 min**
Prep Batch:	**1621166**	**Prep Method:**	**DOE EML HASL-300, U-02-R**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/14/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 *13968-55-3/13966-29-5*	Uranium-233/234		0.515	pCi/g	+/-0.402	0.409	0.422	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.00	pCi/g	+/-0.159	0.160	0.237	1.00
7440-61-1	Uranium-238		0.640	pCi/g	+/-0.417	0.426	0.192	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	18.1	18.2	pCi/g	99.1	(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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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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1624847**	**Method:**	**SRTOT_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**12/16/2016 16:20**	**Analyst:**	**BXF1**	**Instrument:**	**PIC13B**
Data File:	**S1624847r1.xls**	**Aliquot:**	**0.324 g**	**Count Time:**	**60 min**
Prep Batch:	**1624847**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/15/2016 15:39**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	0.683	pCi/g	+/-0.698	0.719	1.13	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	5.80	7.75	mg	74.8	(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).

The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1620997**	**Method:**	**GAMMA_GS**	**SOP Ref:**	**GL-RAD-A-013**
Run Date:	**12/27/2016 06:20**	**Analyst:**	**MXR1**	**Instrument:**	**GAM25**
Data File:	**G411673001.CNF;2**	**Aliquot:**	**155.047 g**	**Count Time:**	**180 min**
Prep Batch:	**1620997**	**Prep Method:**	**DOE HASL 300, 4.5.2.3/Ga-01**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/05/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	-0.00799	pCi/g	+/-0.0186	0.0189	0.0324	0.100
10198-40-0	Cobalt-60	U	0.014	pCi/g	+/-0.0197	0.0207	0.0395	0.100
14683-23-9	Europium-152	U	-0.0113	pCi/g	+/-0.0428	0.0431	0.0811	0.100
15585-10-1	Europium-154	U	0.0166	pCi/g	+/-0.0697	0.0701	0.129	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.091	0.0912	0.0658	0.100
13982-63-3	Radium-226		0.878	pCi/g	+/-0.0943	0.102	0.0585	1.00
15262-20-1	Radium-228	UX	0.00	pCi/g	+/-0.206	0.493	0.312	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).

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"As Received"**
Batch ID:	**1621232**	**Method:**	**I129_SEP_LEPS_GS**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**12/07/2016 11:12**	**Analyst:**	**MJH1**	**Instrument:**	**XRAY6**
Data File:	**I411673001.CNF;1**	**Aliquot:**	**1.021 g**	**Count Time:**	**30 min**
Prep Batch:	**1621232**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**12/06/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.808	pCi/g	+/-1.12	1.18	0.748	2.00

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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"As Received"**
Batch ID:	**1621925**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**12/20/2016 05:38**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCRED**
Data File:	**C1621925.xls**	**Aliquot:**	**0.528 g**	**Count Time:**	**45 min**
Prep Batch:	**1621925**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**12/19/2016 13:54**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-2.19	pCi/g	+/-1.80	1.80	3.22	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.
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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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"As Received"**
Batch ID:	**1622764**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**12/12/2016 22:51**	**Analyst:**	**TXP3**	**Instrument:**	**LSCBROWN**
Data File:	**T1622764.xls**	**Aliquot:**	**1.12 g**	**Count Time:**	**20 min**
Prep Batch:	**1622764**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**12/12/2016 15:26**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-5.87	pCi/g	+/-13.8	13.8	25.4	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).

The MDC is a sample specific MDC.

Rad

Certificate of Analysis
Sample Summary

SDG Number:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"As Received"**
Batch ID:	**1622796**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**12/18/2016 20:39**	**Analyst:**	**GXR1**	**Instrument:**	**LSCBLUE**
Data File:	**E1622796.xls**	**Aliquot:**	**1.002 g**	**Count Time:**	**15 min**
Prep Batch:	**1622796**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**12/14/2016 09:35**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	1.24	pCi/g	+/-1.86	1.87	3.17	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	22700	23500	CPM	96.6	(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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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:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"Dry Weight Corrected"**
Batch ID:	**1622800**	**Method:**	**NI63_LSC**	**SOP Ref:**	**GL-RAD-A-022**
Run Date:	**12/16/2016 12:16**	**Analyst:**	**MYM1**	**Instrument:**	**LSCBROWN**
Data File:	**N1622800.xls**	**Aliquot:**	**0.761 g**	**Count Time:**	**20 min**
Prep Batch:	**1622800**	**Prep Method:**	**DOE RESL Ni-1, Modified**	**Prep SOP Ref:**	**GL-RAD-A-021**
Prep Date:	**12/15/2016 09:52**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-0.29	pCi/g	+/-3.12	3.12	5.54	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	16.7	24.6	mg	67.9	(40%-110%)

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).

The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL411673**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16028**
Lab Sample ID:	**411673001**	**Date Collected:**	**11/30/2016 07:41**	**Matrix:**	**SOIL**
		Date Received:	**12/02/2016 09:20**	**%Moisture:**	**4.4**
Client ID:	**B36M08**			**Prep Basis:**	**"As Received"**
Batch ID:	**1620979**	**Method:**	**ASTM D 2216 (Modified)**	**SOP Ref:**	**GL-OA-E-020**
Run Date:	**12/02/2016 10:51**	**Analyst:**	**LYT1**	**Instrument:**	**SP-39020004**
Data File:				**Count Time:**	
Prep Batch:	**1620979**				
Prep Date:	**12/02/2016 10:51**				

CAS No.	Parmname	Qual	Result	Units	MDC		
%MOISTURE	Moisture		4.44	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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The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 411673

Report Date: December 29, 2016

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1621162									
QC1203682864 MB									
Americium-241			U	0.0913	pCi/g			JXH2	12/27/1619:37
Uncert:				+/-0.251					
TPU:				+/-0.252					
**Americium-243 Tracer	18.6			16.9	pCi/g	REC: 91	(30%-105%)		
Uncert:				+/-2.25					
TPU:				+/-3.42					
QC1203682865 411673001 DUP									
Americium-241		U -0.0672	U	-0.104	pCi/g				12/16/1610:20
Uncert:		+/-0.156		+/-0.294		RPD: 0	N/A		
TPU:		+/-0.156		+/-0.294		RER: 0.215	(0-2)		
**Americium-243 Tracer	19.4	18.6		17.7	pCi/g	REC: 91	(30%-105%)		
Uncert:		+/-2.23		+/-2.39					
TPU:		+/-3.40		+/-3.63					
QC1203682866 LCS									
Americium-241	17.1			16.5	pCi/g	REC: 96	(80%-120%)		12/27/1614:56
Uncert:				+/-0.871					
TPU:				+/-1.63					
**Americium-243 Tracer	18.6			18.0	pCi/g	REC: 97	(30%-105%)		
Uncert:				+/-0.916					
TPU:				+/-1.80					
Batch 1621163									
QC1203682867 MB									
Neptunium-237			U	0.00263	pCi/g			JXH2	12/16/1609:24
Uncert:				+/-0.195					
TPU:				+/-0.195					
**Americium-243 Tracer	1940			1890	pCi/g	REC: 97	(30%-105%)		
QC1203682868 411673001 DUP									
Neptunium-237		U -0.0311	U	0.163	pCi/g				12/16/1609:24
Uncert:		+/-0.138		+/-0.369		RPD: 0	N/A		
TPU:		+/-0.138		+/-0.370		RER: 0.963	(0-2)		
**Americium-243 Tracer	2020	1970		1510	pCi/g	REC: 75	(30%-105%)		
QC1203682869 LCS									
Neptunium-237	40.6			40.7	pCi/g	REC: 100	(80%-120%)		12/16/1609:24
Uncert:				+/-3.19					
TPU:				+/-5.48					
**Americium-243 Tracer	1940			1900	pCi/g	REC: 98	(30%-105%)		
Batch 1621164									
QC1203682870 MB									
Plutonium-238			U	0.0221	pCi/g			JXH2	12/16/1609:44
Uncert:				+/-0.231					
TPU:				+/-0.231					
Plutonium-239/240			U	-0.0757	pCi/g				
Uncert:				+/-0.175					

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

QC Summary

Workorder: 411673

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1621164									
	TPU:			+/-0.176					
**Plutonium-242 Tracer	17.2			13.7	pCi/g	REC: 80	(30%-105%)		
	Uncert:			+/-2.29					
	TPU:			+/-3.38					
QC1203682871 411673001 DUP									
Plutonium-238		U -0.0122	U	-0.0614	pCi/g				12/16/1609:45
	Uncert:	+/-0.183		+/-0.185		RPD: 0	N/A		
	TPU:	+/-0.184		+/-0.186		RER: 0.871	(0-2)		
Plutonium-239/240		U 0.0171	U	0.130	pCi/g				
	Uncert:	+/-0.179		+/-0.298		RPD: 0	N/A		
	TPU:	+/-0.179		+/-0.298		RER: 0.903	(0-2)		
**Plutonium-242 Tracer	17.9	14.0		13.9	pCi/g	REC: 78	(30%-105%)		
	Uncert:	+/-2.01		+/-2.44					
	TPU:	+/-3.01		+/-3.60					
QC1203682872 LCS									
Plutonium-238			U	0.153	pCi/g				12/27/1614:56
	Uncert:			+/-0.132					
	TPU:			+/-0.133					
Plutonium-239/240	17.2			15.5	pCi/g	REC: 90	(80%-120%)		
	Uncert:			+/-0.919					
	TPU:			+/-1.54					
**Plutonium-242 Tracer	17.2			14.2	pCi/g	REC: 83	(30%-105%)		
	Uncert:			+/-0.967					
	TPU:			+/-1.68					
Batch 1621165									
QC1203682873 MB									
Thorium-232			U	-0.0484	pCi/g			JXH2	12/17/1611:21
	Uncert:			+/-0.182					
	TPU:			+/-0.183					
**Thorium-229 Tracer	18.3			11.9	pCi/g	REC: 65	(30%-105%)		
	Uncert:			+/-2.48					
	TPU:			+/-3.87					
QC1203682874 411673001 DUP									
Thorium-232		0.823		0.929	pCi/g				
	Uncert:	+/-0.468		+/-0.508		RPD: 12	(0% - 100%)		
	TPU:	+/-0.482		+/-0.526		RER: 0.289	(0-2)		
**Thorium-229 Tracer	18.3	19.2		16.2	pCi/g	REC: 89	(30%-105%)		
	Uncert:	+/-2.17		+/-2.15					
	TPU:	+/-3.56		+/-3.45					
QC1203682875 LCS									
Thorium-232	17.6			20.3	pCi/g	REC: 116	(80%-120%)		
	Uncert:			+/-2.15					
	TPU:			+/-3.61					
**Thorium-229 Tracer	18.3			15.0	pCi/g	REC: 82	(30%-105%)		
	Uncert:			+/-2.05					
	TPU:			+/-3.33					
Batch 1621166									
QC1203682876 MB									
Uranium-233/234			U	0.147	pCi/g			JXH2	12/27/1611:23
	Uncert:			+/-0.279					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1621166									
	TPU:			+/-0.280					
Uranium-235/236			U	-0.0193	pCi/g				
	Uncert:			+/-0.204					
	TPU:			+/-0.204					
Uranium-238			U	0.228	pCi/g				
	Uncert:			+/-0.321					
	TPU:			+/-0.323					
**Uranium-232 Tracer	18.2			18.6	pCi/g	REC: 102	(30%-105%)		
	Uncert:			+/-2.39					
	TPU:			+/-3.64					
QC1203682877 411673001 DUP									
Uranium-233/234		0.515		1.07	pCi/g				12/17/1611:15
	Uncert:	+/-0.402		+/-0.590		RPD: 70	(0% - 100%)		
	TPU:	+/-0.409		+/-0.610		RER: 1.48	(0-2)		
Uranium-235/236	U	0.00	U	0.0702	pCi/g				
	Uncert:	+/-0.159		+/-0.263		RPD: 0	N/A		
	TPU:	+/-0.160		+/-0.264		RER: 0.446	(0-2)		
Uranium-238		0.640		1.01	pCi/g				
	Uncert:	+/-0.417		+/-0.571		RPD: 45	(0% - 100%)		
	TPU:	+/-0.426		+/-0.589		RER: 0.998	(0-2)		
**Uranium-232 Tracer	19.1	18.1		17.3	pCi/g	REC: 91	(30%-105%)		
	Uncert:	+/-2.13		+/-2.35					
	TPU:	+/-3.31		+/-3.61					
QC1203682878 LCS									
Uranium-233/234				20.4	pCi/g				12/17/1611:15
	Uncert:			+/-2.22					
	TPU:			+/-3.57					
Uranium-235/236				1.08	pCi/g				
	Uncert:			+/-0.585					
	TPU:			+/-0.603					
Uranium-238	23.4			22.6	pCi/g	REC: 96	(80%-120%)		
	Uncert:			+/-2.33					
	TPU:			+/-3.87					
**Uranium-232 Tracer	18.2			19.2	pCi/g	REC: 105	(30%-105%)		
	Uncert:			+/-2.10					
	TPU:			+/-3.26					
Rad Gamma Spec									
Batch 1620997									
QC1203682482 MB									
Cesium-137			U	-0.0212	pCi/g			MXR1	12/27/1606:20
	Uncert:			+/-0.0192					
	TPU:			+/-0.0215					
Cobalt-60			U	0.00303	pCi/g				
	Uncert:			+/-0.0142					
	TPU:			+/-0.0143					
Europium-152			U	-0.0226	pCi/g				
	Uncert:			+/-0.0441					
	TPU:			+/-0.0453					
Europium-154			U	0.0358	pCi/g				
	Uncert:			+/-0.0493					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1620997									
	TPU:			+/-0.0519					
Europium-155			U	-0.0355	pCi/g				
	Uncert:			+/-0.0466					
	TPU:			+/-0.0494					
Radium-226			U	0.0175	pCi/g				
	Uncert:			+/-0.0499					
	TPU:			+/-0.0505					
Radium-228			U	-0.0933	pCi/g				
	Uncert:			+/-0.0796					
	TPU:			+/-0.0901					
QC1203682483 411604001 DUP									
Cesium-137	U	-0.000309	U	0.0162	pCi/g				12/27/1606:21
	Uncert:	+/-0.0234		+/-0.022		RPD:	0	N/A	
	TPU:	+/-0.0234		+/-0.0232		RER:	0.98	(0-2)	
Cobalt-60	U	-0.0127	U	0.00597	pCi/g				
	Uncert:	+/-0.0281		+/-0.018		RPD:	0	N/A	
	TPU:	+/-0.0287		+/-0.0182		RER:	1.08	(0-2)	
Europium-152	U	-0.0238	U	-0.0508	pCi/g				
	Uncert:	+/-0.0528		+/-0.0583		RPD:	0	N/A	
	TPU:	+/-0.054		+/-0.0627		RER:	0.639	(0-2)	
Europium-154	U	-0.0662	U	0.0795	pCi/g				
	Uncert:	+/-0.0747		+/-0.117		RPD:	0	N/A	
	TPU:	+/-0.0806		+/-0.123		RER:	1.95	(0-2)	
Europium-155	U	0.0898	U	0.0564	pCi/g				
	Uncert:	+/-0.0923		+/-0.131		RPD:	0	N/A	
	TPU:	+/-0.0926		+/-0.131		RER:	0.408	(0-2)	
Radium-226		1.03		0.993	pCi/g				
	Uncert:	+/-0.116		+/-0.105		RPD:	3	(0% - 20%)	
	TPU:	+/-0.145		+/-0.114		RER:	0.367	(0-2)	
Radium-228		1.14		1.28	pCi/g				
	Uncert:	+/-0.221		+/-0.208		RPD:	11	(0% - 20%)	
	TPU:	+/-0.267		+/-0.218		RER:	0.779	(0-2)	
QC1203682484 LCS									
Americium-241	489			542	pCi/g	REC:	111	(80%-120%)	12/27/1606:08
	Uncert:			+/-11.1					
	TPU:			+/-42.2					
Cesium-137	178			188	pCi/g	REC:	105	(80%-120%)	
	Uncert:			+/-2.71					
	TPU:			+/-8.50					
Cobalt-60	157			151	pCi/g	REC:	96	(80%-120%)	
	Uncert:			+/-2.77					
	TPU:			+/-6.20					
Europium-152			U	-0.934	pCi/g				
	Uncert:			+/-1.18					
	TPU:			+/-1.26					
Europium-154			U	0.739	pCi/g				
	Uncert:			+/-0.827					
	TPU:			+/-0.892					
Europium-155			U	0.284	pCi/g				
	Uncert:			+/-1.06					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1620997									
	TPU:			+/-1.07					
Radium-226			U	0.372	pCi/g				
	Uncert:			+/-0.832					
	TPU:			+/-0.849					
Radium-228			U	4.21	pCi/g				
	Uncert:			+/-4.55					
	TPU:			+/-4.94					
Batch 1621232									
QC1203683043 MB									
Iodine-129			U	1.05	pCi/g			MJH1	12/07/1611:27
	Uncert:			+/-0.641					
	TPU:			+/-0.649					
QC1203683044 411604001 DUP									
Iodine-129	U	-0.176	U	0.290	pCi/g				12/07/1611:45
	Uncert:	+/-0.426		+/-0.576		RPD:	0	N/A	
	TPU:	+/-0.434		+/-0.592		RER:	1.25	(0-2)	
QC1203683045 411604001 MS									
Iodine-129	39.5 U	-0.176		44.8	pCi/g	REC:	114	(75%-125%)	12/07/1611:45
	Uncert:	+/-0.426		+/-5.39					
	TPU:	+/-0.434		+/-7.28					
QC1203683046 LCS									
Iodine-129	39.2			40.0	pCi/g	REC:	102	(80%-120%)	12/07/1611:46
	Uncert:			+/-5.06					
	TPU:			+/-6.46					
Rad Gas Flow									
Batch 1624847									
QC1203691785 MB									
Total Strontium			U	0.871	pCi/g			BXF1	12/16/1616:42
	Uncert:			+/-1.03					
	TPU:			+/-1.05					
**Strontium Carrier	7.75			6.40	mg	REC:	83	(40%-110%)	
QC1203691786 412279003 DUP									
Total Strontium	U	0.346	U	0.751	pCi/g				12/18/1612:21
	Uncert:	+/-0.719		+/-0.635		RPD:	0	N/A	
	TPU:	+/-0.725		+/-0.665		RER:	0.807	(0-2)	
**Strontium Carrier	7.75	6.40		6.00	mg	REC:	77	(40%-110%)	
QC1203691787 LCS									
Total Strontium	63.4			74.1	pCi/g	REC:	117	(80%-120%)	12/16/1616:42
	Uncert:			+/-4.54					
	TPU:			+/-19.3					
**Strontium Carrier	7.75			5.50	mg	REC:	71	(40%-110%)	
Rad Liquid Scintillation									
Batch 1621925									
QC1203684717 MB									
Carbon-14			U	-0.866	pCi/g			TXJ1	12/20/1607:10
	Uncert:			+/-1.84					
	TPU:			+/-1.84					
QC1203684718 411604001 DUP									
Carbon-14	U	-1.19	U	-0.194	pCi/g				12/20/1607:57

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Parmname	NOM		Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Liquid Scintillation											
Batch 1621925											
	Uncert:		+/-1.86		+/-1.91						
	TPU:		+/-1.86		+/-1.91		RPD:	0	N/A		
							RER:	0.733	(0-2)		
QC1203684719 411604001 MS											
Carbon-14	150	U	-1.19		154	pCi/g	REC:	103	(75%-125%)		12/20/1608:43
	Uncert:		+/-1.86		+/-7.84						
	TPU:		+/-1.86		+/-13.8						
QC1203684720 LCS											
Carbon-14	143				148	pCi/g	REC:	103	(80%-120%)		12/20/1608:59
	Uncert:				+/-7.51						
	TPU:				+/-13.3						
Batch 1622764											
QC1203686848 MB											
Tritium				U	-26.2	pCi/g				TXP3	12/12/1623:34
	Uncert:				+/-12.4						
	TPU:				+/-12.4						
QC1203686849 412139001 DUP											
Tritium		U	-6.53	U	-19.1	pCi/g					12/12/1623:55
	Uncert:		+/-14.4		+/-13.4		RPD:	0	N/A		
	TPU:		+/-14.4		+/-13.4		RER:	1.26	(0-2)		
QC1203686850 412139001 MS											
Tritium	109	U	-6.53		121	pCi/g	REC:	110	(75%-125%)		12/13/1611:23
	Uncert:		+/-14.4		+/-22.9						
	TPU:		+/-14.4		+/-35.7						
QC1203686851 LCS											
Tritium	101				84.4	pCi/g	REC:	83	(80%-120%)		12/13/1600:39
	Uncert:				+/-18.8						
	TPU:				+/-26.9						
Batch 1622796											
QC1203686926 MB											
Technetium-99				U	-0.33	pCi/g				GXR1	12/18/1620:56
	Uncert:				+/-1.35						
	TPU:				+/-1.35						
**Technetium-99m Tracer	23500				23600	CPM	REC:	101	(30%-105%)		
QC1203686927 411604001 DUP											
Technetium-99		U	-1.83	U	0.272	pCi/g					12/18/1621:12
	Uncert:		+/-1.64		+/-1.41		RPD:	0	N/A		
	TPU:		+/-1.64		+/-1.41		RER:	1.91	(0-2)		
**Technetium-99m Tracer	23500		23200		23500	CPM	REC:	100	(30%-105%)		
QC1203686928 LCS											
Technetium-99	68.9				62.3	pCi/g	REC:	90	(80%-120%)		12/19/1606:42
	Uncert:				+/-3.57						
	TPU:				+/-8.00						
**Technetium-99m Tracer	23500				24400	CPM	REC:	104	(30%-105%)		
Batch 1622800											
QC1203686939 MB											
Nickel-63				U	0.390	pCi/g				MYM1	12/16/1612:59
	Uncert:				+/-2.99						
	TPU:				+/-2.99						
							REC:				

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1622800									
**Nickel Carrier	24.6			17.0	mg	69	(40%-110%)		
QC1203686940 411604001 DUP									
Nickel-63	U	2.77	U	0.396	pCi/g				12/16/1613:20
	Uncert:	+/-2.97		+/-3.40		RPD: 0	N/A		
	TPU:	+/-3.01		+/-3.40		RER: 1.03	(0-2)		
**Nickel Carrier	24.6	17.5		16.4	mg	REC: 67	(40%-110%)		
QC1203686941 LCS									
Nickel-63	163			176	pCi/g	REC: 108	(80%-120%)		12/16/1613:42
	Uncert:			+/-8.32					
	TPU:			+/-33.4					
**Nickel Carrier	24.6			16.5	mg	REC: 67	(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.