

April 25, 2016



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April 25, 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: 393993
SDG: GEL393993

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 29, 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: 304043 - 8H
Chain of Custody: F16-028-001 and F16-028-002
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....8

Data Review Qualifier Definitions.....14

Laboratory Certifications.....16

Metals Analysis.....18

 Case Narrative.....19

 Sample Data Summary.....23

 Quality Control Summary.....26

General Chem Analysis.....29

 Case Narrative.....30

 Sample Data Summary.....34

 Quality Control Summary.....39

Radiological Analysis.....42

 Case Narrative.....43

 Sample Data Summary.....53

 Quality Control Summary.....80

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-028
SDG: GEL393993

April 25, 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 March 29, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
393993001	B353C4
393993002	B354H9
393993003	B353C5
393993004	B354J0

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.

April 25, 2016

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.


Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL393993
Work Order #: 393993

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.

	393993	
Analyte	001	003
Uranium	2X	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 1203517819 (B353C5DUP), 1203517820 (B353C5MS), 393993001 (B353C4) and 393993003 (B353C5) 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
1203517528 (B354J0DUP)	Corrosivity and pH	Received 29-MAR-16, out of holding 24-MAR-16
393993002 (B354H9)	pH	Received 29-MAR-16, out of holding 24-MAR-16
393993004 (B354J0)	pH	Received 29-MAR-16, out of holding 24-MAR-16

Radiochemistry

AMCMISO_EIE_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.

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

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

Samples 1203517397 (B353C4DUP) and 393993001 (B353C4) were recounted due to high relative percent difference/relative error ratio. The recounts are reported. Sample 1203517396 (MB) was recounted due to a peak shift. The original count is reported.

Miscellaneous Information

Manual Integration

Manual integration of alpha spectroscopy spectra 1203517396 (MB) was performed to fully separate counts in Regions of Interest which would have been biased.

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.

UIISO_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.

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.

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.

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.

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST **893993** PAGE 1 OF 2

CH2M Hill Plateau Remediation Company
 COLLECTOR: Curt Hoffman, CHPRC
 COMPANY CONTACT: TODAY, D
 TELEPHONE NO.: 376-6427
 PROJECT COORDINATOR: TODAY, D

PROJECT DESIGNATION: 200-WA-1 Opportunistic sampling - soil
 FIELD LOGBOOK NO.: HNF-N-645-3/55
 ACTUAL SAMPLE DEPTH: 147.7-148.2'
 OFFSITE PROPERTY NO.: RR 6465
 BILL OF LADING/AIR BILL NO.: 7759 7227 6802

PRICE CODE: 8H
 AIR QUALITY:
 DATA TURNAROUND: 30 Days / 30 Days
 METHOD OF SHIPMENT: FEDERAL EXPRESS
ORIGINAL

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SAMPLE DATE	SAMPLE TIME
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	Cool <=6C 6 Months G/P 1 250mL	1	250mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	03/24/16	1140
B353C4	SOIL	6 Months G/P 1 500mL	1	500mL	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	✓	✓
B354H9	SOIL	None ASAP G/P 1 60mL	1	60mL	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	MA	MA

SAMPLE NO.	MATRIX*	DATE/TIME	RECEIVED BY/STORER IN	DATE/TIME
B353C4	SOIL	MAR 24 2016 1440	Curt Hoffman CHPRC	3-24-16 1440
B354H9	SOIL	3/28/16 0830	Roy Shepard CHPRC	0830
		3/28/16 0830	FEDEX	
		3/29/16 0850	56rimball	0850
		3/29/16 0850	rimball	0850

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-028-001	PAGE 2 OF 2
COLLECTOR Curt Hoffman CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE	8H
SAMPLING LOCATION C9414, 200-WA-1 #1	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY	<input type="checkbox"/>
ICE CHEST NO. GNS-475	FIELD LOGBOOK NO. HNF-N-045-3/55	ACTUAL SAMPLE DEPTH 10.3/24/14 147.2' - 147.7'	COA 300492-304043	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. PTR 6465	147.7' - 148.2'	BILL OF LADING/AIR BILL NO. 7759 7227 6803		

SPECIAL INSTRUCTIONS

- (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}; UIISO_IE_PRECIP_AEA: COMMON; NP237_IE_PRECIP_AEA: COMMON; TRITIUM_DIST_LSC: COMMON;
- (4) 9045_pH (Non-Aqueous): COMMON {pH Measurement};

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-028-002	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 C9414, 200-WA-1 #2	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GWS-475	FIELD LOGBOOK NO. HNF-N-645-3/55	ACTUAL SAMPLE DEPTH 156.9' - 158.9'	COA 300492	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. PTE 6465		BILL OF LADING/AIR BILL NO. 7759 7227 6803		

SPECIAL INSTRUCTIONS

- (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; NIG3_LSC: COMMON; PUIISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; THISO_IE_PLATE_AEA: COMMON {Thorium-232}; UIISO_IE_PRECIP_AEA: COMMON; NP237_IE_PRECIP_AEA: COMMON; TRITIUM_DIST_LSC: COMMON;
- (4) 9045_pH (Non-Aqueous): COMMON {pH Measurement};

April 25, 2016



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>393983/393989/393993</u>
Received By: <u>Sarah L. Ladd</u>		Date Received: <u>3/29/16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>40C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>201404337</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>			(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
16 Carrier and tracking number.				Circle Applicable: <input checked="" type="checkbox"/> FedEx Air <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7759 7227 6803</u> <u>7759 7496 5289</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DL

Date 3/30/16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result >= 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 25 April 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL393993
Work Order #: 393993

Product: Determination of Metals by ICP-MS
Analytical Method: 6020_METALS_ICPMS
Analytical Procedure: GL-MA-E-014 REV# 27
Analytical Batch: 1555747

Preparation Method: SW846 3050B
Preparation Procedure: GL-MA-E-009 REV# 26
Preparation Batch: 1555746

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517441	Method Blank (MB)ICP-MS
1203517442	Laboratory Control Sample (LCS)
1203517445	393993001(B353C4L) Serial Dilution (SD)
1203517443	393993001(B353C4D) Sample Duplicate (DUP)
1203517444	393993001(B353C4S) 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

Preparation/Analytical Method Verification

Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times.

	393993	
Analyte	001	003
Uranium	2X	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: GEL393993 GEL Work Order: 393993

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: 25 APR 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL393993

CONTRACT: CPRC0F16028

METHOD TYPE: SW846

SAMPLE ID:393993001

BASIS: Dry Weight

DATE COLLECTED 24-MAR-16

CLIENT ID: B353C4

LEVEL: Low

DATE RECEIVED 29-MAR-16

MATRIX: SOIL

%SOLIDS: 96.6

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	658	ug/kg	D	13	39.5	39.5	2	MS	SKJ	03/31/16 10:27	160330-1	1555747

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1555747	1555746	SW846 3050B	0.524	g	50	mL	03/29/16	JP1

***Analytical Methods:**

MS SW846 3050B/6020A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL393993

CONTRACT: CPRC0F16028

METHOD TYPE: SW846

SAMPLE ID:393993003

BASIS: Dry Weight

DATE COLLECTED 24-MAR-16

CLIENT ID: B353C5

LEVEL: Low

DATE RECEIVED 29-MAR-16

MATRIX: SOIL

%SOLIDS: 90.1

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	905	ug/kg	D	14.1	42.7	42.7	2	MS	SKJ	03/31/16 10:34	160330-1	1555747

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1555747	1555746	SW846 3050B	0.52	g	50	mL	03/29/16	JP1

***Analytical Methods:**

MS SW846 3050B/6020A

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 25, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 393993

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1555747										
QC1203517443	393993001	DUP									
Uranium		D	658	D	554	ug/kg	17	(0%-20%)	SKJ	03/31/16	10:28
QC1203517442	LCS										
Uranium	4640			D	5000	ug/kg		(34%-166%)		03/31/16	10:22
QC1203517441	MB										
Uranium				DU	12.7	ug/kg				03/31/16	10:21
QC1203517444	393993001	MS									
Uranium	4730	D	658	D	5470	ug/kg		(75%-125%)		03/31/16	10:30
QC1203517445	393993001	SDILT									
Uranium		D	3.33	D	0.678	ug/L	1.83	(0%-10%)		03/31/16	10:33

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

April 25, 2016

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QC Summary

Workorder: 393993

Page 2 of 2

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD/D%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
-----------------	------------	---------------	-------------	-----------	--------------	---------------	-------------	--------------	--------------	-------------	-------------

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 #: GEL393993
Work Order #: 393993

Product: Ion Chromatography

Analytical Method: 9056_ANIONS_IC

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

Analytical Batches: 1555903 and 1555902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517817	Method Blank (MB)
1203517818	Laboratory Control Sample (LCS)
1203517819	393993003(B353C5) Sample Duplicate (DUP)
1203517820	393993003(B353C5) 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 1203517819 (B353C5DUP), 1203517820 (B353C5MS), 393993001 (B353C4) and 393993003 (B353C5) 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# 21

Analytical Batch: 1555767

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993002	B354H9
393993004	B354J0
1203517527	Laboratory Control Sample (LCS)
1203517528	393993004(B354J0) 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
1203517528 (B354J0DUP)	Corrosivity and pH	Received 29-MAR-16, out of holding 24-MAR-16
393993002 (B354H9)	pH	Received 29-MAR-16, out of holding 24-MAR-16
393993004 (B354J0)	pH	Received 29-MAR-16, out of holding 24-MAR-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.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL393993 GEL Work Order: 393993

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: **Thomas Lewis**

Date: **06 APR 2016**

Title: **Data Validator**

Sample Data Summary

April 25, 2016

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: April 6, 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: B353C4 Project: CPRC0F16028
Sample ID: 393993001 Client ID: CPRC001
Matrix: SOIL
Collect Date: 24-MAR-16 11:40
Receive Date: 29-MAR-16
Collector: Client
Moisture: 3.4%

Table with 12 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time, Batch, Method. Contains data for Ion Chromatography and various anions like Chloride, Fluoride, Nitrate-N, etc.

The following Prep Methods were performed:

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Shows SW846 9056A Total Anions in Soil.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Shows method 1 for 9056_ANIONS_IC.

Notes:

April 25, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 6, 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: B354H9
Sample ID: 393993002
Matrix: SOIL
Collect Date: 24-MAR-16 11:40
Receive Date: 29-MAR-16
Collector: Client
Project: CPRC0F16028
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Row 1: 9045_pH (Non-Aqueous):COMMON "As Received", X, 8.93, 0.010, 0.100, SU, 1, RXB5, 03/29/16, 1655 1555767, 1

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9045D

Notes:

April 25, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 6, 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: B353C5
Sample ID: 393993003
Matrix: SOIL
Collect Date: 24-MAR-16 13:13
Receive Date: 29-MAR-16
Collector: Client
Moisture: 9.92%
Project: CPRC0F16028
Client ID: CPRC001

Table with 12 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time, Batch, Method. Rows include Ion Chromatography and 9056_ANIONS_IC:COMMON + (Add-on) "Dry Weight Corrected" with various chemical results.

The following Prep Methods were performed:

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 9056A, SW846 9056A Total Anions in Soil, MXL2, 03/30/16, 0947, 1555902

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row: 1, 9056_ANIONS_IC

Notes:

April 25, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 6, 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: B354J0
Sample ID: 393993004
Matrix: SOIL
Collect Date: 24-MAR-16 13:13
Receive Date: 29-MAR-16
Collector: Client
Project: CPRC0F16028
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Row 1: 9045_pH (Non-Aqueous):COMMON "As Received", X, 8.63, 0.010, 0.100, SU, 1, RXB5, 03/29/16, 1700, 1555767, 1.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9045D, (empty).

Notes:

Quality Control Summary

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 6, 2016

Page 1 of 2

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 393993

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1555903										
QC1203517819 393993003 DUP											
Chloride		2430		2540	ug/Kg	4.45	^	(+/-2200)	MXL2	03/30/16	12:24
Fluoride	B	743	B	721	ug/Kg	3.11	^	(+/-1100)			
Nitrate-N	B	986	B	1090	ug/Kg	10.3	^	(+/-1100)			
Nitrite-N	U	365	U	364	ug/Kg	N/A					
Phosphorus in phosphate	U	740	U	738	ug/Kg	N/A					
Sulfate		7690		8190	ug/Kg	6.36	^	(+/-4410)			
QC1203517818 LCS											
Chloride		49800		45400	ug/Kg			91.2 (80%-120%)		03/30/16	10:46
Fluoride		24900		23500	ug/Kg			94.5 (80%-120%)			
Nitrate-N		24900		23200	ug/Kg			93.1 (80%-120%)			
Nitrite-N		24900		23600	ug/Kg			95 (80%-120%)			
Phosphorus in phosphate		12400		12000	ug/Kg			96.6 (80%-120%)			
Sulfate		99500		94100	ug/Kg			94.5 (80%-120%)			
QC1203517817 MB											
Chloride			U	665	ug/Kg					03/30/16	10:14
Fluoride			U	328	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						

QC1203517820 393993003 MS

GEL LABORATORIES LLC

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

QC Summary

Workorder: 393993

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1555903										
Chloride	54800	2430		51500	ug/Kg		89.5	(48%-145%)		03/30/16	12:55
Fluoride	27400	B	743	24300	ug/Kg		86	(30%-135%)	MXL2		
Nitrate-N	27400	B	986	26000	ug/Kg		91.3	(70%-125%)			
Nitrite-N	27400	U	365	25700	ug/Kg		93.8	(70%-120%)			
Phosphorus in phosphate	13700	U	740	11300	ug/Kg		79.9	(35%-134%)			
Sulfate	110000		7690	110000	ug/Kg		93.7	(45%-162%)			

Titration and Ion Analysis

Batch	1555767										
QC1203517528	393993004	DUP									
pH		X	8.63	X	8.69	SU	0.693	(0%-30%)	RXB5	03/29/16	17:08
QC1203517527	LCS										
pH	7.00				7.03	SU	100	(70%-130%)		03/29/16	16:39

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 \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

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

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL393993
Work Order #: 393993

Product: AMCMISO_EIE_PRECIP_AEA: COMMON
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1555724

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517385	Method Blank (MB)
1203517386	393993001(B353C4) Sample Duplicate (DUP)
1203517387	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: NP237_IE_PRECIP_AEA: COMMON
Analytical Method: NP237_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-032 REV# 20
Analytical Batch: 1555727

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5

1203517388	Method Blank (MB)
1203517389	393993001(B353C4) Sample Duplicate (DUP)
1203517390	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: PUIISO_PRECIP_AEA:COMMON
Analytical Method: PUIISO_PLATE_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1555730

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517396	Method Blank (MB)
1203517397	393993001(B353C4) Sample Duplicate (DUP)
1203517398	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

Samples 1203517397 (B353C4DUP) and 393993001 (B353C4) were recounted due to high relative percent difference/relative error ratio. The recounts are reported. Sample 1203517396 (MB) was recounted due to a peak shift. The original count is reported.

Miscellaneous Information

Manual Integration

Manual integration of alpha spectroscopy spectra 1203517396 (MB) was performed to fully separate counts in Regions of Interest which would have been biased.

1. The Pu-236 tracer peak centroid for sample 1203517396 is greater than 50 keV from the expected energy value of 5749 keV. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-236 region of interest. Reporting results.

Product: THISO_IE_PLATE_AEA: COMMON
Analytical Method: THISO_IE_PLATE_AEA
Analytical Procedure: GL-RAD-A-038 REV# 17
Analytical Batch: 1555733

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517404	Method Blank (MB)
1203517405	393993001(B353C4) Sample Duplicate (DUP)
1203517406	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: UIISO_IE_PRECIP_AEA:COMMON
Analytical Method: UIISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1555736

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517416	Method Blank (MB)

1203517417 393993001(B353C4) Sample Duplicate (DUP)
1203517418 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: Dry Weight

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203517289	393993001(B353C4) 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: 1555928

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5

1203517871	Method Blank (MB)
1203517872	393993001(B353C4) Sample Duplicate (DUP)
1203517873	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, 1203517872 (B353C4DUP) and 393993001 (B353C4), did not meet the relative error ratio requirement for Europium-152 but both sample and duplicate results were less than their respective MDCs.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Data rejected due to interference.	Europium-152	393993001	B353C4
			393993003	B353C5
			1203517872	B353C4(393993001DUP)

Product: I129_SEP_LEPS_GS

Analytical Method: I129_SEP_LEPS_GS

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

Analytical Batch: 1555991

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203518042	Method Blank (MB)
1203518043	393993001(B353C4) Sample Duplicate (DUP)
1203518044	393993001(B353C4) Matrix Spike (MS)
1203518045	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: 1558681

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203525170	Method Blank (MB)
1203525171	394080003(B353C7) Sample Duplicate (DUP)
1203525172	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: 1556045

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203518194	Method Blank (MB)
1203518195	393993001(B353C4) Sample Duplicate (DUP)
1203518196	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# 17

Analytical Batch: 1556064

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1555692

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203518268	Method Blank (MB)
1203518269	393993001(B353C4) Sample Duplicate (DUP)
1203518270	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: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

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

Analytical Batch: 1558440

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203524478	Method Blank (MB)
1203524479	393993001(B353C4) Sample Duplicate (DUP)
1203524481	393993001(B353C4) Matrix Spike (MS)

1203524483 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: 1558446

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
393993001	B353C4
393993003	B353C5
1203524496	Method Blank (MB)
1203524497	393993001(B353C4) Sample Duplicate (DUP)
1203524499	393993001(B353C4) Matrix Spike (MS)
1203524501	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.

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: GEL393993 GEL Work Order: 393993

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: Theresa Austin

Date: 25 APR 2016

Title: Group Leader

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1555724
Run Date: 04/21/2016 09:14
Data File: S0393993001_AM.1A.gcnf
Prep Batch: 1555724
Prep Date: 04/19/2016 00:00

Method: AMCMISO_EIE_PREC_AEA
Analyst: KXB2
Aliquot: 0.11 g
Prep Method: DOE EML HASL-300, Am-05

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1105
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	-0.0154	pCi/g	+/-0.133	0.133	0.308	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	15.1	18.9	pCi/g	79.7	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1555727
Run Date: 04/21/2016 09:30
Data File: S0393993001_NP.1A.gcnf
Prep Batch: 1555727
Prep Date: 04/19/2016 00:00

Method: NP237_IE_PRECIP_AEA
Analyst: KXB2
Aliquot: 0.109 g
Prep Method: ASTM C 1476-00 Modified

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-032
Instrument: 1205
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.0909	pCi/g	+/-0.250	0.250	0.434	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1700	1840	pCi/g	92.1	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1555730
Run Date: 04/22/2016 08:52
Data File: S0393993001_PU.2A.gcnf
Prep Batch: 1555730
Prep Date: 04/19/2016 00:00

Method: PUIISO_PLATE_AEA
Analyst: KXB2
Aliquot: 0.11 g
Prep Method: DOE EML HASL-300, Pu-11-

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1065
Count Time: 239.9998 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.427	pCi/g	+/-0.807	0.813	1.34	1.00
OER-100-70	Plutonium-239/240	U	0.185	pCi/g	+/-0.633	0.634	1.17	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-236 Tracer	7.66	21.9	pCi/g	35	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1555733
Run Date: 04/21/2016 08:53
Data File: S0393993001_TH.1A.gcnf
Prep Batch: 1555733
Prep Date: 04/19/2016 00:00

Method: THISO_IE_PLATE_AEA
Analyst: KXB2
Aliquot: 0.115 g
Prep Method: DOE EML HASL-300, Th-01-

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-038
Instrument: 1026
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
TH-232 <small>7440-29-1</small>	Thorium-232		0.860	pCi/g	+/-0.480	0.497	0.321	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	14.1	17.7	pCi/g	80	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1555736
Run Date: 04/21/2016 09:31
Data File: S0393993001_UU.1A
Prep Batch: 1555736
Prep Date: 04/19/2016 00:00

Method: UIISO_IE_PRECIP_AEA
Analyst: KXB2
Aliquot: 0.11 g
Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1113
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234	U	0.399	pCi/g	+/-0.373	0.377	0.435	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.0621	pCi/g	+/-0.233	0.233	0.392	1.00
7440-61-1	Uranium-238		0.330	pCi/g	+/-0.319	0.322	0.198	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	19.9	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.
 - 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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1558681
Run Date: 04/19/2016 18:52
Data File: S1558681r1.xls
Prep Batch: 1558681
Prep Date: 04/18/2016 00:00

Method: SRTOT_SEP_PRECIP_GPC
Analyst: KSD1
Aliquot: 0.395 g
Prep Method: EPA 905.0 Modified/DOE RP5

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-004
Instrument: PIC6A
Count Time: 60 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.0847	pCi/g	+/-0.529	0.530	1.05	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.10	7.77	mg	91.4	(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: GEL393993
 Lab Sample ID: 393993001
 Client ID: B353C4
 Batch ID: 1555928
 Run Date: 04/20/2016 06:55
 Data File: G393993001.CNF;2
 Prep Batch: 1555928
 Prep Date: 04/30/2016 00:00

Client: CPRC001
 Date Collected: 03/24/2016 11:40
 Date Received: 03/29/2016 08:50
 Method: GAMMA_GS
 Analyst: MXR1
 Aliquot: 169.39 g
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F16028
 Matrix: SOIL
 %Moisture: 3.4
 Prep Basis: "Dry Weight Corrected"
 SOP Ref: GL-RAD-A-013
 Instrument: GAM05
 Count Time: 500 min
 Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	0.000706	pCi/g	+/-0.0118	0.0118	0.0189	0.100
10198-40-0	Cobalt-60	U	-0.000905	pCi/g	+/-0.0115	0.0115	0.0205	0.100
14683-23-9	Europium-152	U	-0.034	pCi/g	+/-0.0297	0.0336	0.0456	0.100
15585-10-1	Europium-154	U	0.0133	pCi/g	+/-0.0383	0.0388	0.0698	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.0499	0.0503	0.0433	0.100
13982-63-3	Radium-226		0.550	pCi/g	+/-0.0535	0.0705	0.0363	1.00
15262-20-1	Radium-228		0.811	pCi/g	+/-0.0997	0.161	0.0678	3.00

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

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993001	Date Collected: 03/24/2016 11:40	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 3.4
Client ID: B353C4	Method: I129_SEP_LEPS_GS	Prep Basis: "As Received"
Batch ID: 1555991	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 04/01/2016 14:08	Aliquot: 1.04 g	Instrument: XRAY5
Data File: I393993001.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 60 min
Prep Batch: 1555991		
Prep Date: 04/01/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.519	pCi/g	+/-0.771	0.807	1.28	2.00

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

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 - 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993001	Date Collected: 03/24/2016 11:40	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 3.4
Client ID: B353C4		Prep Basis: "As Received"
Batch ID: 1556045	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 04/12/2016 09:07	Analyst: MYM1	Instrument: LSCORANGE
Data File: E1556045.xls	Aliquot: 1.213 g	Count Time: 30.01227 min
Prep Batch: 1556045	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 04/07/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	0.372	pCi/g	+/-0.826	0.827	1.43	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	36600	39400	CPM	92.9	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1556064
Run Date: 04/14/2016 15:01
Data File: N1556064.xls
Prep Batch: 1556064
Prep Date: 04/11/2016 12:21

Method: NI63_LSC
Analyst: CXS7
Aliquot: 0.534 g
Prep Method: DOE RESL Ni-1, Modified

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-022
Instrument: LSCGREEN
Count Time: 30 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-0.686	pCi/g	+/-3.61	3.61	6.36	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	16.9	24.4	mg	69.2	(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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Client ID: B353C4
Batch ID: 1558440
Run Date: 04/18/2016 13:40
Data File: T1558440.xls
Prep Batch: 1558440
Prep Date: 04/18/2016 00:00

Method: TRITIUM_DIST_LSC
Analyst: TXJ1
Aliquot: 2.51 g
Prep Method: EPA 906.0 Modified

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-002
Instrument: LSCBLUE
Count Time: 20 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	0.978	pCi/g	+/-10.8	10.8	19.2	30.0

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

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 - 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993001	Date Collected: 03/24/2016 11:40	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 3.4
Client ID: B353C4		Prep Basis: "As Received"
Batch ID: 1558446	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 04/21/2016 16:47	Analyst: TXJ1	Instrument: LSCRED
Data File: C1558446.xls	Aliquot: 0.51 g	Count Time: 45 min
Prep Batch: 1558446	Prep Method: EPA EERF C-01 Modified	
Prep Date: 04/21/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-0.778	pCi/g	+/-1.88	1.88	3.29	5.00

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

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 - 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: GEL393993
Lab Sample ID: 393993001

Client: CPRC001
Date Collected: 03/24/2016 11:40
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 3.4

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5	Method: AMCMISO_EIE_PREC_AEA	Prep Basis: "Dry Weight Corrected"
Batch ID: 1555724	Analyst: KXB2	SOP Ref: GL-RAD-A-011
Run Date: 04/21/2016 09:14	Aliquot: 0.109 g	Instrument: 1106
Data File: S0393993003_AM.1A.gcnf	Prep Method: DOE EML HASL-300, Am-05	Count Time: 240 min
Prep Batch: 1555724		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/19/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	-0.0125	pCi/g	+/-0.187	0.187	0.437	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	16.4	19.1	pCi/g	86.1	(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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5		Prep Basis: "Dry Weight Corrected"
Batch ID: 1555727	Method: NP237_IE_PRECIP_AEA	SOP Ref: GL-RAD-A-032
Run Date: 04/21/2016 09:30	Analyst: KXB2	Instrument: 1206
Data File: S0393993003_NP.1A.gcnf	Aliquot: 0.112 g	Count Time: 240 min
Prep Batch: 1555727	Prep Method: ASTM C 1476-00 Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/19/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.0366	pCi/g	+/-0.204	0.204	0.390	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1690	1790	pCi/g	93.9	(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: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Client ID: B353C5
Batch ID: 1555730
Run Date: 04/21/2016 09:14
Data File: S0393993003_PU.1A.gcnf
Prep Batch: 1555730
Prep Date: 04/19/2016 00:00

Method: PUIISO_PLATE_AEA
Analyst: KXB2
Aliquot: 0.109 g
Prep Method: DOE EML HASL-300, Pu-11-

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1112
Count Time: 239.9998 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.317	pCi/g	+/-0.371	0.374	0.508	1.00
OER-100-70	Plutonium-239/240	U	0.412	pCi/g	+/-0.428	0.431	0.592	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-236 Tracer	15.9	22.1	pCi/g	72	(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: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Client ID: B353C5
Batch ID: 1555733
Run Date: 04/21/2016 08:53
Data File: S0393993003_TH.1A.gcnf
Prep Batch: 1555733
Prep Date: 04/19/2016 00:00

Method: THISO_IE_PLATE_AEA
Analyst: KXB2
Aliquot: 0.102 g
Prep Method: DOE EML HASL-300, Th-01-

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-038
Instrument: 1027
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
TH-232 <small>7440-29-1</small>	Thorium-232		1.30	pCi/g	+/-0.587	0.617	0.270	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	16.2	19.9	pCi/g	81.4	(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: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Client ID: B353C5
Batch ID: 1555736
Run Date: 04/21/2016 09:31
Data File: S0393993003_UU.1A
Prep Batch: 1555736
Prep Date: 04/19/2016 00:00

Method: UIISO_IE_PRECIP_AEA
Analyst: KXB2
Aliquot: 0.109 g
Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1115
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		0.601	pCi/g	+/-0.464	0.472	0.519	1.00
15117-96-1/13982-7	Uranium-235/236		0.607	pCi/g	+/-0.483	0.490	0.260	1.00
7440-61-1	Uranium-238		1.35	pCi/g	+/-0.634	0.660	0.429	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	18.9	19.2	pCi/g	98.4	(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: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Client ID: B353C5
Batch ID: 1558681
Run Date: 04/19/2016 18:53
Data File: S1558681r1.xls
Prep Batch: 1558681
Prep Date: 04/18/2016 00:00

Method: SRTOT_SEP_PRECIP_GPC
Analyst: KSD1
Aliquot: 0.337 g
Prep Method: EPA 905.0 Modified/DOE RP5

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-004
Instrument: PIC7C
Count Time: 60 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.396	pCi/g	+/-0.463	0.464	1.04	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	8.10	7.77	mg	104	(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: GEL393993
 Lab Sample ID: 393993003

 Client ID: B353C5
 Batch ID: 1555928
 Run Date: 04/20/2016 06:55
 Data File: G393993003.CNF;1
 Prep Batch: 1555928
 Prep Date: 04/30/2016 00:00

Client: CPRC001
 Date Collected: 03/24/2016 13:13
 Date Received: 03/29/2016 08:50

 Method: GAMMA_GS
 Analyst: MXR1
 Aliquot: 149.822 g
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F16028
 Matrix: SOIL
 %Moisture: 9.9

 Prep Basis: "Dry Weight Corrected"
 SOP Ref: GL-RAD-A-013
 Instrument: GAM18
 Count Time: 120 min
 Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	0.00998	pCi/g	+/-0.0243	0.0247	0.0453	0.100
10198-40-0	Cobalt-60	U	0.0276	pCi/g	+/-0.0252	0.0282	0.0503	0.100
14683-23-9	Europium-152	U	0.00597	pCi/g	+/-0.0706	0.0707	0.109	0.100
15585-10-1	Europium-154	U	0.00894	pCi/g	+/-0.0746	0.0747	0.138	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.132	0.133	0.131	0.100
13982-63-3	Radium-226		0.795	pCi/g	+/-0.0984	0.118	0.0795	1.00
15262-20-1	Radium-228		1.08	pCi/g	+/-0.179	0.250	0.159	3.00

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

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5		Prep Basis: "As Received"
Batch ID: 1555991	Method: I129_SEP_LEPS_GS	SOP Ref: GL-RAD-A-006
Run Date: 04/01/2016 14:22	Analyst: MJH1	Instrument: GAM21
Data File: I393993003.CNF;1	Aliquot: 1.01 g	Count Time: 60 min
Prep Batch: 1555991	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 04/01/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.814	pCi/g	+/-0.677	0.775	1.03	2.00

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

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 - 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1556045	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 04/12/2016 09:40	Aliquot: 1.247 g	Instrument: LSCORANGE
Data File: E1556045.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30.01237 min
Prep Batch: 1556045		
Prep Date: 04/07/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	0.532	pCi/g	+/-0.731	0.734	1.24	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	37500	39400	CPM	95.2	(30%-105%)

Comments:

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 - 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: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Client ID: B353C5
Batch ID: 1556064
Run Date: 04/14/2016 15:32
Data File: N1556064.xls
Prep Batch: 1556064
Prep Date: 04/11/2016 12:21

Method: NI63_LSC
Analyst: CXS7
Aliquot: 0.551 g
Prep Method: DOE RESL Ni-1, Modified

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-022
Instrument: LSCGREEN
Count Time: 30 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-0.239	pCi/g	+/-3.27	3.27	5.74	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	18.2	24.4	mg	74.5	(40%-110%)

Comments:

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 - 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5		Prep Basis: "As Received"
Batch ID: 1558440	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 04/18/2016 14:01	Analyst: TXJ1	Instrument: LSCBLUE
Data File: T1558440.xls	Aliquot: 2.53 g	Count Time: 20 min
Prep Batch: 1558440	Prep Method: EPA 906.0 Modified	
Prep Date: 04/18/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-3.98	pCi/g	+/-10.5	10.5	19.5	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.
 - 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: GEL393993	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 393993003	Date Collected: 03/24/2016 13:13	Matrix: SOIL
	Date Received: 03/29/2016 08:50	%Moisture: 9.9
Client ID: B353C5		Prep Basis: "As Received"
Batch ID: 1558446	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 04/21/2016 17:33	Analyst: TXJ1	Instrument: LSCRED
Data File: C1558446.xls	Aliquot: 0.5 g	Count Time: 45 min
Prep Batch: 1558446	Prep Method: EPA EERF C-01 Modified	
Prep Date: 04/21/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	0.192	pCi/g	+/-1.94	1.94	3.35	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).
The MDC is a sample specific MDC.

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL393993
Lab Sample ID: 393993003

Client: CPRC001
Date Collected: 03/24/2016 13:13
Date Received: 03/29/2016 08:50

Project: CPRC0F16028
Matrix: SOIL
%Moisture: 9.9

Quality Control Summary

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 25, 2016

Page 1 of 7

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 393993

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, QC Criteria, Range, Analyst, Date Time. Contains multiple rows for Americium-241, Americium-243 Tracer, and Neptunium-237 with associated QC values and criteria.

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 393993

Page 2 of 7

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1555730								
**Plutonium-236 Tracer	TPU:			+/-0.333					
	21.1			17.5	pCi/g	REC:	83 (30%-105%)		
	Uncert:			+/-2.57					
	TPU:			+/-3.85					
QC1203517397 393993001 DUP									
Plutonium-238		U	0.427	U	0.205				04/22/1608:52
	Uncert:		+/-0.807		+/-0.388	RPD:	0 N/A		
	TPU:		+/-0.813		+/-0.389	RER:	0.482 (0-2)		
Plutonium-239/240		U	0.185		0.672				
	Uncert:		+/-0.633		+/-0.521	RPD:	54 (0% - 100%)		
	TPU:		+/-0.634		+/-0.528	RER:	1.16 (0-2)		
**Plutonium-236 Tracer	21.5		7.66		15.8	pCi/g	REC:	74 (30%-105%)	
	Uncert:		+/-3.95		+/-2.47				
	TPU:		+/-5.74		+/-3.72				
QC1203517398 LCS									
Plutonium-238				U	0.151				04/21/1609:30
	Uncert:				+/-0.320				
	TPU:				+/-0.321				
Plutonium-239/240	17.6				18.8	pCi/g	REC:	107 (80%-120%)	
	Uncert:				+/-2.42				
	TPU:				+/-3.52				
**Plutonium-236 Tracer	21.1				16.9	pCi/g	REC:	80 (30%-105%)	
	Uncert:				+/-2.56				
	TPU:				+/-3.84				
Batch	1555733								
QC1203517404 MB									
Thorium-232				U	0.0391			KXB2	04/21/1608:53
	Uncert:				+/-0.172				
	TPU:				+/-0.172				
**Thorium-229 Tracer	17.4				16.1	pCi/g	REC:	93 (30%-105%)	
	Uncert:				+/-2.02				
	TPU:				+/-3.25				
QC1203517405 393993001 DUP									
Thorium-232			0.860		1.00				
	Uncert:		+/-0.480		+/-0.495	RPD:	16 (0% - 100%)		
	TPU:		+/-0.497		+/-0.516	RER:	0.395 (0-2)		
**Thorium-229 Tracer	17.4		14.1		14.3	pCi/g	REC:	82 (30%-105%)	
	Uncert:		+/-2.08		+/-1.95				
	TPU:		+/-3.34		+/-3.16				
QC1203517406 LCS									
Thorium-232	17.0				17.2	pCi/g	REC:	101 (80%-120%)	04/21/1608:53
	Uncert:				+/-2.12				
	TPU:				+/-3.36				
**Thorium-229 Tracer	17.4				14.8	pCi/g	REC:	86 (30%-105%)	
	Uncert:				+/-2.13				
	TPU:				+/-3.39				
Batch	1555736								
QC1203517416 MB									
Uranium-233/234				U	0.264			KXB2	04/21/1609:31
	Uncert:				+/-0.429				

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 393993

Page 3 of 7

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Alpha Spec										
Batch	1555736									
Uranium-235/236		TPU:		+/-0.431						
			U	0.0806	pCi/g					
		Uncert:		+/-0.302						
Uranium-238		TPU:		+/-0.303						
			U	0.110	pCi/g					
		Uncert:		+/-0.302						
**Uranium-232 Tracer	18.6	TPU:		+/-0.303						
				14.3	pCi/g	REC:	77	(30%-105%)		
		Uncert:		+/-2.63						
		TPU:		+/-4.04						
QC1203517417 393993001 DUP										
Uranium-233/234		U	0.399	0.908	pCi/g					04/21/1609:31
		Uncert:	+/-0.373	+/-0.502		RPD:	70	(0% - 100%)		
		TPU:	+/-0.377	+/-0.516		RER:	1.56	(0-2)		
Uranium-235/236		U	0.0621	0.315	pCi/g					
		Uncert:	+/-0.233	+/-0.347		RPD:	22	(0% - 100%)		
		TPU:	+/-0.233	+/-0.349		RER:	1.18	(0-2)		
Uranium-238			0.330	0.939	pCi/g					
		Uncert:	+/-0.319	+/-0.501		RPD:	96	(0% - 100%)		
		TPU:	+/-0.322	+/-0.516		RER:	1.96	(0-2)		
**Uranium-232 Tracer	18.7	19.9	19.2	19.2	pCi/g	REC:	103	(30%-105%)		
		Uncert:	+/-2.33	+/-2.27						
		TPU:	+/-3.66	+/-3.57						
QC1203517418 LCS										
Uranium-233/234				25.1	pCi/g					04/21/1609:31
		Uncert:		+/-2.64						
		TPU:		+/-4.34						
Uranium-235/236				2.01	pCi/g					
		Uncert:		+/-0.851						
		TPU:		+/-0.895						
Uranium-238	24.0			24.0	pCi/g	REC:	100	(80%-120%)		
		Uncert:		+/-2.57						
		TPU:		+/-4.18						
**Uranium-232 Tracer	18.6			16.6	pCi/g	REC:	89	(30%-105%)		
		Uncert:		+/-2.41						
		TPU:		+/-3.74						
Rad Gamma Spec										
Batch	1555928									
QC1203517871 MB										
Cesium-137			U	-0.00768	pCi/g					MXR1 04/20/1606:55
		Uncert:		+/-0.0154						
		TPU:		+/-0.0158						
Cobalt-60			U	-0.00634	pCi/g					
		Uncert:		+/-0.0181						
		TPU:		+/-0.0183						
Europium-152			U	-0.037	pCi/g					
		Uncert:		+/-0.0542						
		TPU:		+/-0.0568						
Europium-154			U	-0.0116	pCi/g					
		Uncert:		+/-0.0433						

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 393993

Page 4 of 7

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gamma Spec										
Batch	1555928									
Europium-155		TPU:		+/-0.0436						
			U	0.00259	pCi/g					
		Uncert:		+/-0.0487						
Radium-226		TPU:		+/-0.0488						
			U	-0.0401	pCi/g					
		Uncert:		+/-0.0368						
Radium-228		TPU:		+/-0.0411						
			U	0.0229	pCi/g					
		Uncert:		+/-0.106						
		TPU:		+/-0.106						
QC1203517872	393993001	DUP								
Cesium-137		U	0.000706	U	-0.00405	pCi/g				04/20/1607:07
		Uncert:	+/-0.0118		+/-0.0193		RPD: 0	N/A		
		TPU:	+/-0.0118		+/-0.0193		RER: 0.412	(0-2)		
Cobalt-60		U	-0.000905	U	-0.00498	pCi/g				
		Uncert:	+/-0.0115		+/-0.0164		RPD: 0	N/A		
		TPU:	+/-0.0115		+/-0.0166		RER: 0.396	(0-2)		
Europium-152		U	-0.034	U	0.0337	pCi/g				
		Uncert:	+/-0.0297		+/-0.0484		RPD: 0	N/A		
		TPU:	+/-0.0336		+/-0.0508		RER: 2.18	(0-2)		
Europium-154		U	0.0133	U	-0.0392	pCi/g				
		Uncert:	+/-0.0383		+/-0.0568		RPD: 0	N/A		
		TPU:	+/-0.0388		+/-0.0596		RER: 1.45	(0-2)		
Europium-155		UX	0.00	UX	0.00	pCi/g				
		Uncert:	+/-0.0499		+/-0.0562		RPD: 0	N/A		
		TPU:	+/-0.0503		+/-0.0568		RER: 0.617	(0-2)		
Radium-226			0.550		0.602	pCi/g				
		Uncert:	+/-0.0535		+/-0.0712		RPD: 9	(0% - 20%)		
		TPU:	+/-0.0705		+/-0.0871		RER: 0.917	(0-2)		
Radium-228			0.811		0.712	pCi/g				
		Uncert:	+/-0.0997		+/-0.134		RPD: 13	(0% - 20%)		
		TPU:	+/-0.161		+/-0.155		RER: 0.876	(0-2)		
QC1203517873	LCS									
Americium-241		489			544	pCi/g	REC: 111	(80%-120%)		04/20/1606:56
		Uncert:			+/-10.6					
		TPU:			+/-68.8					
Cesium-137		181			179	pCi/g	REC: 99	(80%-120%)		
		Uncert:			+/-3.44					
		TPU:			+/-15.8					
Cobalt-60		170			167	pCi/g	REC: 98	(80%-120%)		
		Uncert:			+/-3.90					
		TPU:			+/-13.5					
Europium-152				U	0.0784	pCi/g				
		Uncert:			+/-2.01					
		TPU:			+/-2.01					
Europium-154				U	-0.608	pCi/g				
		Uncert:			+/-1.35					
		TPU:			+/-1.38					
Europium-155				U	0.547	pCi/g				
		Uncert:			+/-1.65					

April 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 393993

Page 5 of 7

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, QC Criteria, Range, Analyst, Date Time. Rows include Rad Gamma Spec, Radium-226, Radium-228, Iodine-129, Rad Gas Flow, and Rad Liquid Scintillation.

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QC Summary

Workorder: 393993

Page 6 of 7

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1556045								
Techneium-99		U	0.372	U	0.0411	pCi/g			
		Uncert:	+/-0.826		+/-0.750		RPD: 0	N/A	
		TPU:	+/-0.827		+/-0.750		RER: 0.58	(0-2)	
**Techneium-99m Tracer	39400		36600		36300	CPM	REC: 92	(30%-105%)	
QC1203518196	LCS								
Techneium-99	56.8				54.6	pCi/g	REC: 96	(80%-120%)	04/12/1614:07
		Uncert:			+/-3.04				
		TPU:			+/-6.97				
**Techneium-99m Tracer	39400				39200	CPM	REC: 100	(30%-105%)	
Batch	1556064								
QC1203518268	MB								
Nickel-63				U	0.0779	pCi/g		CXS7	04/14/1616:04
		Uncert:			+/-3.16				
		TPU:			+/-3.16				
**Nickel Carrier	24.4				18.8	mg	REC: 77	(40%-110%)	
QC1203518269	393993001	DUP							
Nickel-63		U	-0.686	U	-1.56	pCi/g			04/14/1616:35
		Uncert:	+/-3.61		+/-3.07		RPD: 0	N/A	
		TPU:	+/-3.61		+/-3.07		RER: 0.363	(0-2)	
**Nickel Carrier	24.4		16.9		18.7	mg	REC: 77	(40%-110%)	
QC1203518270	LCS								
Nickel-63	239				238	pCi/g	REC: 100	(80%-120%)	04/14/1617:06
		Uncert:			+/-8.89				
		TPU:			+/-44.7				
**Nickel Carrier	24.4				18.2	mg	REC: 75	(40%-110%)	
Batch	1558440								
QC1203524478	MB								
Tritium				U	2.93	pCi/g		TXJ1	04/18/1617:15
		Uncert:			+/-10.8				
		TPU:			+/-10.9				
QC1203524479	393993001	DUP							
Tritium		U	0.978	U	-3.7	pCi/g			04/18/1617:36
		Uncert:	+/-10.8		+/-10.3		RPD: 0	N/A	
		TPU:	+/-10.8		+/-10.3		RER: 0.616	(0-2)	
QC1203524481	393993001	MS							
Tritium	92.6	U	0.978		94.8	pCi/g	REC: 102	(75%-125%)	04/18/1618:19
		Uncert:	+/-10.8		+/-16.6				
		TPU:	+/-10.8		+/-27.2				
QC1203524483	LCS								
Tritium	91.2				89.8	pCi/g	REC: 99	(80%-120%)	04/18/1619:02
		Uncert:			+/-16.1				
		TPU:			+/-26.0				
Batch	1558446								
QC1203524496	MB								
Carbon-14				U	-0.667	pCi/g		TXJ1	04/22/1609:39
		Uncert:			+/-1.62				
		TPU:			+/-1.62				
QC1203524497	393993001	DUP							
Carbon-14		U	-0.778	U	-0.108	pCi/g			04/22/1610:25

QC Summary

Workorder: 393993

Page 7 of 7

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1558446									
		Uncert:	+/-1.88	+/-1.93						
		TPU:	+/-1.88	+/-1.93		RPD: 0	N/A			
						RER: 0.487	(0-2)			
QC1203524499	393993001	MS								
Carbon-14	138	U	-0.778	138	pCi/g	REC: 100	(75%-125%)		04/22/16	11:58
		Uncert:	+/-1.88	+/-4.21						
		TPU:	+/-1.88	+/-11.0						
QC1203524501	LCS									
Carbon-14	128			129	pCi/g	REC: 100	(80%-120%)		04/22/16	13:31
		Uncert:		+/-3.93						
		TPU:		+/-10.3						

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 >= EQC 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 acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

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

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