

9/2/2016



September 02, 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: 402941  
SDG: GEL402941

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 03, 2016 and August 04, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

*B Luthman*  
Brielle Luthman for  
Heather Shaffer  
Project Manager

Purchase Order: 300192 - 8H  
Chain of Custody: F16-028-024, F16-028-026 and F16-028-028  
Enclosures



## Table of Contents

Sample Issue Resolution.....	1
Case Narrative.....	3
Chain of Custody and Supporting Documentation.....	11
Data Review Qualifier Definitions.....	20
Laboratory Certifications.....	22
Metals Analysis.....	24
Case Narrative.....	25
Sample Data Summary.....	29
Quality Control Summary.....	33
General Chem Analysis.....	36
Case Narrative.....	37
Sample Data Summary.....	41
Quality Control Summary.....	45
Radiological Analysis.....	49
Case Narrative.....	50
Sample Data Summary.....	62
Quality Control Summary.....	102

# Sample Issue Resolution

**SAMPLE ISSUE RESOLUTION**

<b>SIR NUM</b>	SIR16-589
<b>REV NUM</b>	0
<b>DATE INITIATED</b>	8/23/2016

**SAMPLE EVENT INFORMATION**

**SAF NUM(S)** F16-028

**OPERABLE UNIT(S)** 200-WA-1

**PROJECT(S)** 200-WA-1

**SAMPLE EVENT TITLE(S)** 200-WA-1 OU OPPORTUNISTIC SAMPLING C9414 AND C9567 - SOIL

**LABORATORY** GEL Laboratories, LLC

**SAMPLING INFORMATION**

**NUMBER OF SAMPLES** 3

**SAMPLE NUMBERS** B35XJ1, B35XJ3, B35XJ5

**SAMPLE MATRIX** SOIL

**COLLECTION DATE** 7/28/2016 - 8/2/2016

**SDG NUM** GEL402941

**ISSUE BACKGROUND**

**CLASS** General Laboratory Direction

**TYPE** Analysis Turnaround Time Modification

**DESCRIPTION** Due to the in-growth required for Ra-226, the lab has requested an extension on the turnaround time. The lab is expecting to report by 9/3/16.

**DISPOSITION**

**DESCRIPTION** Proposed Resolution: The lab will ingrow for the required amount of time.

**JUSTIFICATION** Final Disposition: Extend the due date to 9/3/16

SUBMITTED BY: Heather Shaffer DATE: 08/18/2016

ACCEPTED BY: Dave Todak DATE: 08/23/2016

# Case Narrative

**General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF F16-028  
SDG: GEL402941**

**September 02, 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 August 03, 2016 and August 04, 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. The lab requested an extension on the due date to allow for in-growth of Ra-226. Please refer to the enclosed SIR for further details.

**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:

<b>Laboratory Identification</b>	<b>Sample Description</b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5

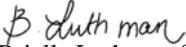
**Case Narrative**

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

**Data Package**

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

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

  
Brielle Luthman for  
Heather Shaffer  
Project Manager

**Technical Case Narrative**  
**CH2MHill Plateau Remediation Company (CPRC)**  
**SDG #: GEL402941**  
**Work Order #: 402941**

## Metals

### **Determination of Metals by ICP-MS**

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

### **Technical Information**

#### **Sample Dilutions**

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

Analyte	402941		
	001	002	003
Uranium	2X	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 402941002 (B35XJ3) and 402941003 (B35XJ5) 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
1203599132 (B35XH9DUP)	pH	Received 30-JUL-16, out of holding 28-JUL-16
402941001 (B35XJ1)	pH	Received 03-AUG-16, out of holding 28-JUL-16
402941002 (B35XJ3)	pH	Received 03-AUG-16, out of holding 01-AUG-16

**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
1203602763 (B35XJ5DUP)	pH	Received 03-AUG-16, out of holding 02-AUG-16
402941003 (B35XJ5)	pH	Received 04-AUG-16, out of holding 02-AUG-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.

**PUISO\_PRECIP\_AEA:COMMON**

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

**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.

**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.

**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.

**THISO\_IE\_PLATE\_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****Sample Re-prep/Re-analysis**

Sample 402941003 (B35XJ5) was reprepared due to high carrier/tracer yield. The re-analysis is being reported.

**Recounts**

Sample 1203617116 (B35XJ5DUP) was recounted due to high carrier/tracer yield. The recount is reported.

Sample 1203617117 (LCS) was recounted due to a peak shift. The recount is reported.

**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.

**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.

**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.

**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.

**SRTOT\_SEP\_PRECIP\_GPC: COMMON**

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

**Technical Information****Recounts**

Sample 1203601566 (MB) was recounted due to a suspected blank false positive. The recount is reported.

**SRTOT\_SEP\_PRECIP\_GPC: COMMON**

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

**Technical Information****Sample Re-prep/Re-analysis**

Samples were reprepared to verify the results. The re-analysis is being reported.

**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.

#### **C14\_LSC: COMMON**

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

#### **TRITIUM\_DIST\_LSC: COMMON**

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

##### **Technical Information**

###### **Recounts**

Samples were recounted due to low recovery. The recounts are reported.

#### **NI63\_LSC**

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

##### **Technical Information**

###### **Sample Re-prep/Re-analysis**

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

##### **Certification Statement**

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

# **Chain of Custody and Supporting Documentation**

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					F16-028-024	PAGE 1 OF 2
<b>COLLECTOR</b> Larry Rosane /CHPRC		<b>COMPANY CONTACT</b> TODAK, D		<b>TELEPHONE NO.</b> 376-6427		<b>PROJECT COORDINATOR</b> TODAK, D		
<b>SAMPLING LOCATION</b> C9411, I-005		<b>PROJECT DESIGNATION</b> 200-WA-1 Opportunistic sampling - soil			<b>SAF NO.</b> F16-028		<b>PRICE CODE</b> 8H <b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b> GWS-410		<b>FIELD LOGBOOK NO.</b> HNF-N-645-5		<b>ACTUAL SAMPLE DEPTH</b> 218.6 - 221.1		<b>COA</b> 300192		
<b>SHIPPED TO</b> GEL Laboratories, LLC		<b>OFFSITE PROPERTY NO.</b> N/A 620-241		<b>BILL OF LADING/AIR BILL NO.</b> N/A 212-82-110		<b>METHOD OF SHIPMENT</b> FEDERAL EXPRESS ORIGINAL		
<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> *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. NA	<b>PRESERVATION</b>		Cool <=6C	None	None	None	
		<b>HOLDING TIME</b>		6 Months	6 Months	6 Months	None	ASAP
		<b>TYPE OF CONTAINER</b>		G/P	G/P	G/P	Moisture Resistant Cont.	G/P
		<b>NO. OF CONTAINER(S)</b>		1	1	1	1	1
		<b>VOLUME</b>		250mL	250mL	500mL	200g	60mL
		<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS
<b>SAMPLE NO.</b>	<b>MATRIX*</b>	<b>SAMPLE DATE</b>	<b>SAMPLE TIME</b>					
B35XJ1	SOIL	7-28-16	1515	✓	✓	✓	✓	

402941

9/2/2016

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
Larry Rosane /CHPRC	8/1/16 1440	SSU	8/1/16 1440		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
SSU #1	AUG 02 2016 0700	Janelle Zunker /CHPRC	AUG 02 2016 0700		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Janelle Zunker /CHPRC	AUG 02 2016 1200	FEDER			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
FF		M. Kinslow	8-31-16 0915		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

14 of 112

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST <b>402941</b>		F16-028-024	PAGE 2 OF 2
COLLECTOR Larry Rosane /CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9411, I-005	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. <b>GWS-418</b>	FIELD LOGBOOK NO. <b>HNF-N-645-5</b>	ACTUAL SAMPLE DEPTH <b>pg 12 218.6 - 221.1</b>	COA 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	<b>ORIGINAL</b>
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. <b>pg 13</b> <del>N/A</del> <b>928216</b>		BILL OF LADING/AIR BILL NO. <del>N/A</del> <b>928216</b>	<b>7768 9701 9783</b>	

**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; 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) Moisture Content - D2216 {Percent moisture (wet sample)};
- (5) 9045\_pH (Non-Aqueous): COMMON {pH Measurement};

9/2/2016

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					F16-028-026	PAGE 1 OF 2
<b>COLLECTOR</b> Dave Floyd CHPRC		<b>COMPANY CONTACT</b> TODAK, D		<b>TELEPHONE NO.</b> 376-6427		<b>PROJECT COORDINATOR</b> TODAK, D		
<b>SAMPLING LOCATION</b> C9411, I-006		<b>PROJECT DESIGNATION</b> 200-WA-1 Opportunistic sampling - soil			<b>SAF NO.</b> F16-028		<b>PRICE CODE</b> 8H <b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b> 6WS-418		<b>FIELD LOGBOOK NO.</b> HMF-AI-645-5 pg 13		<b>ACTUAL SAMPLE DEPTH</b> 220.5-230.5 FT		<b>COA</b> 300192		
<b>SHIPPED TO</b> GEL Laboratories, LLC		<b>OFFSITE PROPERTY NO.</b> 6890			<b>BILL OF LADING/AIR BILL NO.</b> 776897019783			
<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> *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. NA	<b>PRESERVATION</b>		Cool <=6C	None	None	None	
		<b>HOLDING TIME</b>		6 Months	6 Months	6 Months	None	ASAP
		<b>TYPE OF CONTAINER</b>		G/P	G/P	G/P	Moisture Resistant Cont.	G/P
		<b>NO. OF CONTAINER(S)</b>		1	1	1	1	1
		<b>VOLUME</b>		250mL	250mL	500mL	200g	60mL
	<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS
<b>SAMPLE NO.</b>	<b>MATRIX*</b>	<b>SAMPLE DATE</b>	<b>SAMPLE TIME</b>					
B35XJ3	SOIL	8/1/16	1340	✓	✓	✓	✓	

402941

9/2/2016

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Dave Floyd CHPRC	DATE/TIME 8/1/16 1440	RECEIVED BY/STORED IN SSU-1	DATE/TIME 8/1/16 1440	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME AUG 02 2016 0750	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME AUG 02 2016 0750		
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME AUG 02 2016 1200	RECEIVED BY/STORED IN FEDEX	DATE/TIME		
RELINQUISHED BY/REMOVED FROM FA	DATE/TIME	RECEIVED BY/STORED IN M. Kinslow	DATE/TIME 8-3-16 0915		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>		<b>DATE/TIME</b>	
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>		<b>DATE/TIME</b>	

16 of 112

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST <b>402941</b>		F16-028-026	PAGE 2 OF 2
COLLECTOR Dave Floyd CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9411, I-006	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. <b>665-418</b>	FIELD LOGBOOK NO. <b>HNF-N-645-5 pg 13</b>	ACTUAL SAMPLE DEPTH <b>228.5 - 230.5 ft</b>	COA 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	<b>ORIGINAL</b>
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. <b>6890</b>	BILL OF LADING/AIR BILL NO. <b>7768 9701 9783</b>			

**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; 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) Moisture Content - D2216 {Percent moisture (wet sample)};
- (5) 9045\_pH (Non-Aqueous): COMMON {pH Measurement};

9/2/2016

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CP/KE</u>		SDG/AR/COC/Work Order: <u>402941</u>
Received By: <u>MAC</u>		Date Received: <u>8-3-16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" 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>CP/KE</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"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2c</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>130462012</u> Secondary Temperature Device Serial # (if Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>FedEx Air</u> 7768 9960 0306 2c 7768 9701 0783 2c 7768 9994 9382 22c no ice

Comments (Use Continuation Form if needed):

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST <b>402941</b>				F16-028-028	PAGE 1 OF 2	
COLLECTOR Juan Aguilar /CHPRC		COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D		PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days	
SAMPLING LOCATION C9411, I-007		PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil		SAF NO. F16-028	AIR QUALITY <input type="checkbox"/>			
ICE CHEST NO. <b>GWS-513</b>		FIELD LOGBOOK NO. HNF-N-645-S / Pg 14	ACTUAL SAMPLE DEPTH 238' - 240.5'		COA 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	<b>ORIGINAL</b>	
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. <b>72116</b>		BILL OF LADING/AIR BILL NO. <b>7768 9937 3016</b>				
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA	PRESERVATION	Cool <=6C	None	None	None	None	
		HOLDING TIME	6 Months	6 Months	6 Months	None	ASAP	
		TYPE OF CONTAINER	G/P	G/P	G/P	Moisture Resistant Cont.	G/P	
		NO. OF CONTAINER(S)	1	1	1	1	1	
		VOLUME	250mL	250mL	500mL	200g	60mL	
		SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS
SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME				
B35XJ5		SOIL	AUG 02 2016	0858	✓	✓	✓	

402941

9/2/2016

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Juan Aguilar /CHPRC		DATE/TIME AUG 02 2016 0945	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME AUG 02 2016 0945	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC		DATE/TIME AUG 02 2016 H00	RECEIVED BY/STORED IN FEDEL	DATE/TIME	
RELINQUISHED BY/REMOVED FROM R		DATE/TIME	RECEIVED BY/STORED IN M. Krasnow	DATE/TIME 8-4-16 0905	
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

19 of 112

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST <b>402941</b>		F16-028-028	PAGE 2 OF 2
COLLECTOR <b>Juan Aguilar /CHPRC</b>	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9411, I-007	PROJECT DESIGNATION 200-WA-1 Opportunistic sampling - soil	SAF NO. F16-028	AIR QUALITY <input type="checkbox"/>	ORIGINAL	
ICE CHEST NO. <b>GWS-513</b>	FIELD LOGBOOK NO. <b>HNF-N-645-5/Pg 14</b>	ACTUAL SAMPLE DEPTH <b>238' - 240.5'</b>	COA 300192	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. <b>LEGAC</b>	BILL OF LADING/AIR BILL NO.			

**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; PUIISO\_PLATE\_AEA: COMMON; SRTOT\_SEP\_PRECIP\_GPC: COMMON; TC99\_EIE\_LSC: COMMON; THISO\_IE\_PLATE\_AEA: COMMON {Thorium-232}; UISO\_IE\_PRECIP\_AEA: COMMON; NP237\_IE\_PRECIP\_AEA: COMMON; TRITIUM\_DIST\_LSC: COMMON;
- (4) Moisture Content - D2216 {Percent moisture (wet sample)};
- (5) 9045\_pH (Non-Aqueous): COMMON {pH Measurement};

9/2/2016

20 of 112

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>402941</u>	
Received By: <u>mk</u>		Date Received: <u>8-4-16</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" 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>200</u>	
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?	<input type="checkbox"/>		
Package COC and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?	<input type="checkbox"/>	Hazard Class Shipped:	UN#:
Samples identified as Foreign Soil?	<input type="checkbox"/>		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1c 2c</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130461962</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Preservation added, Lot#: Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7769 1263 9178 2c</u> <u>1263 9454 1c</u> <u>7769 0828 7224 2c</u> <u>0828 7728 1c</u> <u>1263 9454 2c</u> <u>7769 9937 3016 2c</u> <u>7769 0828 8648 2c</u>
Comments (Use Continuation Form if needed):				

# **Data Review Qualifier Definitions**

## Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

# Laboratory Certifications

## List of current GEL Certifications as of 02 September 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 #: GEL402941**  
**Work Order #: 402941**

**Product: Determination of Metals by ICP-MS****Analytical Method:** 6020\_METALS\_ICPMS**Analytical Procedure:** GL-MA-E-014 REV# 28**Analytical Batch:** 1587268**Preparation Method:** SW846 3050B**Preparation Procedure:** GL-MA-E-009 REV# 26**Preparation Batch:** 1587267

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203598502	Method Blank (MB)ICP-MS
1203598503	Laboratory Control Sample (LCS)
1203598506	402941001(B35XJ1L) Serial Dilution (SD)
1203598504	402941001(B35XJ1D) Sample Duplicate (DUP)
1203598505	402941001(B35XJ1S) 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.

Analyte	402941		
	001	002	003
Uranium	2X	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: GEL402941 GEL Work Order: 402941

**The Qualifiers in this report are defined as follows:**

- \* Duplicate analysis not within control limits
- 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:** 01 SEP 2016

**Title:** Data Validator

# Sample Data Summary

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** GEL402941

**CONTRACT:** CPRC0F16028

**METHOD TYPE:** SW846

**SAMPLE ID:**402941001

**BASIS:** Dry Weight

**DATE COLLECTED** 28-JUL-16

**CLIENT ID:** B35XJ1

**LEVEL:** Low

**DATE RECEIVED** 03-AUG-16

**MATRIX:** SOIL

**%SOLIDS:** 83

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	915	ug/kg	D*	15.9	48.2	48.2	2	MS	SKJ	08/17/16 21:49	160817-1	1587268

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1587268	1587267	SW846 3050B	0.501	g	50	mL	08/05/16	SXW1

**\*Analytical Methods:**

MS SW846 3050B/6020A

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: GEL402941

CONTRACT: CPRC0F16028

METHOD TYPE: SW846

SAMPLE ID: 402941002

BASIS: Dry Weight

DATE COLLECTED 01-AUG-16

CLIENT ID: B35XJ3

LEVEL: Low

DATE RECEIVED 03-AUG-16

MATRIX: SOIL

%SOLIDS: 87

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	316	ug/kg	D*	14.4	43.5	43.5	2	MS	SKJ	08/17/16 22:04	160817-1	1587268

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1587268	1587267	SW846 3050B	0.527	g	50	mL	08/05/16	SXW1

**\*Analytical Methods:**

MS SW846 3050B/6020A

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** GEL402941

**CONTRACT:** CPRC0F16028

**METHOD TYPE:** SW846

**SAMPLE ID:**402941003

**BASIS:** Dry Weight

**DATE COLLECTED** 02-AUG-16

**CLIENT ID:** B35XJ5

**LEVEL:** Low

**DATE RECEIVED** 04-AUG-16

**MATRIX:** SOIL

**%SOLIDS:** 82

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	349	ug/kg	D*	14.5	44	44	2	MS	SKJ	08/17/16 22:08	160817-1	1587268

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1587268	1587267	SW846 3050B	0.533	g	50	mL	08/05/16	SXW1

**\*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: September 1, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 402941

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis - ICPMS</b>											
Batch	1587268										
QC1203598504	402941001	DUP									
Uranium		*D	915	*D	1510	ug/kg	49.4*	(0%-20%)	SKJ	08/17/16	21:53
QC1203598503	LCS										
Uranium	4780			D	4710	ug/kg		98.5	(80%-120%)		08/17/16 21:37
QC1203598502	MB										
Uranium				DU	12.6	ug/kg					08/17/16 21:33
QC1203598505	402941001	MS									
Uranium	5760	*D	915	D	7580	ug/kg		116	(75%-125%)		08/17/16 21:57
QC1203598506	402941001	SDILT									
Uranium		*D	3.80	D	0.770	ug/L	1.42	(0%-10%)			08/17/16 22:00

**Notes:**

The Qualifiers in this report are defined as follows:

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

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 2 of 2

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

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 #: GEL402941  
 Work Order #: 402941**

**Product: Ion Chromatography****Analytical Method:** 9056\_ANIONS\_IC**Analytical Procedure:** GL-GC-E-086 REV# 25**Analytical Batches:** 1591048 and 1591047

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203608371	Method Blank (MB)
1203608372	Laboratory Control Sample (LCS)
1203608373	402541001(B35XH7) Sample Duplicate (DUP)
1203608374	402541001(B35XH7) 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 402941002 (B35XJ3) and 402941003 (B35XJ5) 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 Batches:** 1587527 and 1588895

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

<b>GEL Sample ID#</b>	<b>Client Sample Identification</b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203599131	Laboratory Control Sample (LCS)
1203599132	402787001(B35XH9) Sample Duplicate (DUP)
1203602761	Laboratory Control Sample (LCS)
1203602763	402941003(B35XJ5) 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.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203599132 (B35XH9DUP)	pH	Received 30-JUL-16, out of holding 28-JUL-16
1203602763 (B35XJ5DUP)	pH	Received 03-AUG-16, out of holding 02-AUG-16
402941001 (B35XJ1)	pH	Received 03-AUG-16, out of holding 28-JUL-16
402941002 (B35XJ3)	pH	Received 03-AUG-16, out of holding 01-AUG-16
402941003 (B35XJ5)	pH	Received 04-AUG-16, out of holding 02-AUG-16

**Certification Statement**

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL402941 GEL Work Order: 402941

**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: Kristen Mizzell

Date: 23 AUG 2016

Title: Analyst I

# Sample Data Summary





9/2/2016

**GEL LABORATORIES LLC**

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

**Certificate of Analysis**

Report Date: August 23, 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: B35XJ5 Project: CPRC0F16028  
 Sample ID: 402941003 Client ID: CPRC001  
 Matrix: SOIL  
 Collect Date: 02-AUG-16 08:58  
 Receive Date: 04-AUG-16  
 Collector: Client  
 Moisture: 14.7%

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>												
9056_ANIONS_IC:COMMON + (Add-on) "Dry Weight Corrected"												
Chloride	B	1120	837	2330	ug/Kg	9.93	1	MXL2	08/18/16	0909	1591048	1
Fluoride	U	395	395	1160	ug/Kg	9.93	1					
Nitrate-N	U	384	384	1160	ug/Kg	9.93	1					
Nitrite-N	U	384	384	1160	ug/Kg	9.93	1					
Phosphorus in phosphate	U	779	779	2330	ug/Kg	9.93	1					
Sulfate	B	1610	1550	4650	ug/Kg	9.93	1					

<b>Titration and Ion Analysis</b>												
9045_pH (Non-Aqueous):COMMON "As Received"												
pH at Temp 22.6C	X	7.89	0.010	0.100	SU		1	RXB5	08/09/16	1347	1588895	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9056A	SW846 9056A Total Anions in Soil	MXL2	08/17/16	1156	1591047

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	SW846 9045D	

**Notes:**

Column headers are defined as follows:

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

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: August 23, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 402941

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1591048										
QC1203608373	402541001	DUP									
Chloride	B	1850	B	1670	ug/Kg	10.3	^	(+/-2200)	MXL2	08/18/16	06:40
Fluoride	B	680	B	676	ug/Kg	0.562	^	(+/-1100)			
Nitrate-N		1550		1570	ug/Kg	1.52	^	(+/-1100)			
Nitrite-N	U	363	U	364	ug/Kg	N/A					
Phosphorus in phosphate	U	736	U	738	ug/Kg	N/A					
Sulfate		11900		10800	ug/Kg	9.32	^	(+/-4410)			
QC1203608372	LCS										
Chloride		49900		47200	ug/Kg			94.7	(80%-120%)		08/18/16 05:40
Fluoride		24900		23100	ug/Kg			92.7	(80%-120%)		
Nitrate-N		24900		23700	ug/Kg			95.2	(80%-120%)		
Nitrite-N		24900		24000	ug/Kg			96.1	(80%-120%)		
Phosphorus in phosphate		12500		12400	ug/Kg			99.6	(80%-120%)		
Sulfate		99800		96700	ug/Kg			96.9	(80%-120%)		
QC1203608371	MB										
Chloride			U	716	ug/Kg						08/18/16 05:10
Fluoride			U	338	ug/Kg						
Nitrate-N			U	328	ug/Kg						
Nitrite-N			U	328	ug/Kg						
Phosphorus in phosphate			U	667	ug/Kg						
Sulfate			U	1320	ug/Kg						

QC1203608374 402541001 MS

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1591048										
Chloride	54700	B	1850	53400	ug/Kg		94.3	(48%-145%)		08/18/16	07:10
Fluoride	27300	B	680	25100	ug/Kg		89.4	(30%-135%)	MXL2		
Nitrate-N	27300		1550	28500	ug/Kg		98.6	(70%-125%)			
Nitrite-N	27300	U	363	27000	ug/Kg		98.8	(70%-120%)			
Phosphorus in phosphate	13700	U	736	10000	ug/Kg		73.5	(35%-134%)			
Sulfate	109000		11900	117000	ug/Kg		96.4	(45%-162%)			

**Titration and Ion Analysis**

Batch	1587527										
QC1203599132	402787001	DUP									
pH		X	8.55	X	8.56	SU	0.117	(0%-30%)	RXB5	08/03/16	19:33
QC1203599131	LCS										
pH	7.00				6.99	SU	99.9	(70%-130%)		08/03/16	19:28
Batch	1588895										
QC1203602763	402941003	DUP									
pH		X	7.89	X	7.84	SU	0.636	(0%-30%)	RXB5	08/09/16	13:49
QC1203602761	LCS										
pH	7.00				6.99	SU	99.9	(70%-130%)		08/09/16	13:46

**Notes:**

The Qualifiers in this report are defined as follows:

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

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 3 of 3

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

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 #: GEL402941  
Work Order #: 402941**

**Product:** AMCMISO\_EIE\_PRECIP\_AEA: COMMON  
**Analytical Method:** AMCMISO\_EIE\_PREC\_AEA  
**Analytical Procedure:** GL-RAD-A-011 REV# 26  
**Analytical Batch:** 1587947

**Preparation Method:** ASTM D 2216 (Modified)  
**Preparation Procedure:** GL-RAD-A-021 REV# 20  
**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203600136	Method Blank (MB)
1203600137	402941001(B35XJ1) Sample Duplicate (DUP)
1203600138	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\_PRECIP\_AEA  
**Analytical Procedure:** GL-RAD-A-011 REV# 26  
**Analytical Batch:** 1587948

**Preparation Method:** ASTM D 2216 (Modified)  
**Preparation Procedure:** GL-RAD-A-021 REV# 20  
**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1

402941002	B35XJ3
402941003	B35XJ5
1203600139	Method Blank (MB)
1203600140	402941001(B35XJ1) Sample Duplicate (DUP)
1203600141	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:** 1587949

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203600142	Method Blank (MB)
1203600143	402941001(B35XJ1) Sample Duplicate (DUP)
1203600144	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:** ASTM C 1475-00 Modified

**Analytical Procedure:** GL-RAD-A-032 REV# 21

**Analytical Batch:** 1587950

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203600145	Method Blank (MB)
1203600146	402941001(B35XJ1) Sample Duplicate (DUP)
1203600147	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Product:** THISO\_IE\_PLATE\_AEA: COMMON

**Analytical Method:** THISO\_IE\_PRECIP\_AEA

**Analytical Procedure:** GL-RAD-A-038 REV# 17

**Analytical Batch:** 1587951

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
1203600148	Method Blank (MB)
1203600149	402941001(B35XJ1) Sample Duplicate (DUP)
1203600150	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Product:** THISO\_IE\_PLATE\_AEA: COMMON

**Analytical Method:** THISO\_IE\_PRECIP\_AEA

**Analytical Procedure:** GL-RAD-A-038 REV# 17

**Analytical Batch:** 1594561

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941003	B35XJ5
1203617115	Method Blank (MB)
1203617116	402941003(B35XJ5) Sample Duplicate (DUP)
1203617117	Laboratory Control Sample (LCS)

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

#### **Data Summary:**

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

#### **Technical Information**

##### **Sample Re-prep/Re-analysis**

Sample 402941003 (B35XJ5) was reprepared due to high carrier/tracer yield. The re-analysis is being reported.

##### **Recounts**

Sample 1203617116 (B35XJ5DUP) was recounted due to high carrier/tracer yield. The recount is reported.

Sample 1203617117 (LCS) was recounted due to a peak shift. The recount is reported.

#### **Product: Dry Weight**

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5

1203599183                      402941001(B35XJ1) 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: Dry Weight**

**Analytical Method:** ASTM D 2216 (Modified)

**Analytical Procedure:** GL-OA-E-020 REV# 10

**Analytical Batch:** 1589767

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941002	B35XJ3
402941003	B35XJ5
1203605963	402941002(B35XJ3) 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: I129\_SEP\_LEPS\_GS**

**Analytical Method:** I129\_SEP\_LEPS\_GS

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

**Analytical Batch:** 1585659

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203594530	Method Blank (MB)
1203594531	402432001(B35XH3) Sample Duplicate (DUP)
1203594532	402432001(B35XH3) Matrix Spike (MS)
1203594533	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:** GAMMA\_GS:COMMON + (Add-on)

**Analytical Method:** GAMMA\_GS

**Analytical Procedure:** GL-RAD-A-013 REV# 25

**Analytical Batch:** 1587994

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203600272	Method Blank (MB)
1203600273	402941001(B35XJ1) Sample Duplicate (DUP)
1203600274	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, 1203600273 (B35XJ1DUP) and 402941001 (B35XJ1), relative error ratio is greater than the client requirement for Eu-155; however, both results are less than their respective MDCs.

**Qualifier Information**

<b>Qualifier</b>	<b>Reason</b>	<b>Analyte</b>	<b>Sample</b>	<b>Client Sample</b>
------------------	---------------	----------------	---------------	----------------------

X	Data rejected due to interference.	Europium-155	402941001	B35XJ1
X	Data rejected due to low abundance.	Radium-228	402941003	B35XJ5

**Product:** SRTOT\_SEP\_PRECIP\_GPC: COMMON

**Analytical Method:** SRTOT\_SEP\_PRECIP\_GPC

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

**Analytical Batch:** 1588469

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
1203601566	Method Blank (MB)
1203601567	402432002(B35XH5) Sample Duplicate (DUP)
1203601568	Laboratory Control Sample (LCS)

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

#### **Data Summary:**

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

#### **Technical Information**

##### **Recounts**

Sample 1203601566 (MB) was recounted due to a suspected blank false positive. The recount is reported.

**Product:** SRTOT\_SEP\_PRECIP\_GPC: COMMON

**Analytical Method:** SRTOT\_SEP\_PRECIP\_GPC

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

**Analytical Batch:** 1592814

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941003	B35XJ5
1203612718	Method Blank (MB)
1203612719	402941003(B35XJ5) Sample Duplicate (DUP)
1203612720	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Technical Information**

**Sample Re-prep/Re-analysis**

Samples were re-prepped to verify the results. The re-analysis is being reported.

**Product: TC99\_SEP\_GPC**

**Analytical Method:** TC99\_EIE\_LSC

**Analytical Procedure:** GL-RAD-A-059 REV# 4

**Analytical Batch:** 1588132

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203600560	Method Blank (MB)
1203600561	402432001(B35XH3) Sample Duplicate (DUP)
1203600562	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:** 1588489

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203601657	Method Blank (MB)
1203601658	402432001(B35XH3) Sample Duplicate (DUP)
1203601659	402432001(B35XH3) Matrix Spike (MS)
1203601660	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Product:** TRITIUM\_DIST\_LSC: COMMON

**Analytical Method:** TRITIUM\_DIST\_LSC

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

**Analytical Batch:** 1588517

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203601770	Method Blank (MB)
1203601771	402432001(B35XH3) Sample Duplicate (DUP)
1203601772	402432001(B35XH3) Matrix Spike (MS)
1203601773	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Technical Information**

**Recounts**

Samples were recounted due to low recovery. The recounts are reported.

**Product:** NI63\_LSC

**Analytical Method:** NI63\_LSC

**Analytical Procedure:** GL-RAD-A-022 REV# 18

**Analytical Batch:** 1591683

**Preparation Method:** ASTM D 2216 (Modified)

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

**Preparation Batch:** 1587569

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
402941001	B35XJ1
402941002	B35XJ3
402941003	B35XJ5
1203609943	Method Blank (MB)
1203609944	402432001(B35XH3) Sample Duplicate (DUP)
1203609945	Laboratory Control Sample (LCS)

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

**Data Summary:**

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

**Technical Information**

**Sample Re-prep/Re-analysis**

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

**Certification Statement**

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

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL402941 GEL Work Order: 402941

**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: 02 SEP 2016

Title: Group Leader

# Sample Data Summary

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587947	Method: AMCMISO_EIE_PREC_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1097
Data File: S0402941001_AM.1A.gcnf	Aliquot: 0.129 g	Count Time: 240 min
Prep Batch: 1587947	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.0217	pCi/g	+/-0.227	0.227	0.473	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	8.94	16.6	pCi/g	54	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587948	Method: PUIISO_PRECIP_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1106
Data File: S0402941001_PU.1A.gcnf	Aliquot: 0.129 g	Count Time: 239.9998 min
Prep Batch: 1587948	Prep Method: DOE EML HASL-300, Pu-11-	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.0631	pCi/g	+/-0.177	0.178	0.189	1.00
OER-100-70	Plutonium-239/240	U	0.0479	pCi/g	+/-0.180	0.180	0.302	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	10.9	15.3	pCi/g	70.9	(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: GEL402941  
Lab Sample ID: 402941001

Client: CPRC001  
Date Collected: 07/28/2016 15:15  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 17.2

Client ID: B35XJ1  
Batch ID: 1587949  
Run Date: 08/18/2016 09:13  
Data File: S0402941001\_UU.1A.gcnf  
Prep Batch: 1587949  
Prep Date: 08/16/2016 00:00

Method: UIISO\_IE\_PRECIP\_AEA  
Analyst: HAKB  
Aliquot: 0.129 g  
Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-011  
Instrument: 1024  
Count Time: 239.9998 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		1.55	pCi/g	+/-0.586	0.622	0.388	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.195	pCi/g	+/-0.256	0.258	0.195	1.00
7440-61-1	Uranium-238		1.16	pCi/g	+/-0.507	0.530	0.346	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	13.0	16.1	pCi/g	80.2	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587950	Method: ASTM C 1475-00 Modified	SOP Ref: GL-RAD-A-032
Run Date: 08/18/2016 09:28	Analyst: HAKB	Instrument: 1208
Data File: S0402941001_NP.1A.gcnf	Aliquot: 0.108 g	Count Time: 240 min
Prep Batch: 1587950	Prep Method: ASTM C 1475-00 Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0806	pCi/g	+/-0.153	0.153	0.471	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1840	1860	pCi/g	98.6	(30%-105%)

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941  
Lab Sample ID: 402941001

Client: CPRC001  
Date Collected: 07/28/2016 15:15  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 17.2

Client ID: B35XJ1  
Batch ID: 1587951  
Run Date: 08/18/2016 09:28  
Data File: S0402941001\_TH.1A.gcnf  
Prep Batch: 1587951  
Prep Date: 08/16/2016 00:00

Method: THISO\_IE\_PRECIP\_AEA  
Analyst: HAKB  
Aliquot: 0.108 g  
Prep Method: DOE EML HASL-300, Th-01-

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-038  
Instrument: 1191  
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		0.644	pCi/g	+/-0.478	0.488	0.438	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	17.7	18.8	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: GEL402941  
Lab Sample ID: 402941001

Client: CPRC001  
Date Collected: 07/28/2016 15:15  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 17.2

Client ID: B35XJ1  
Batch ID: 1588469  
Run Date: 08/22/2016 17:20  
Data File: S1588469r2.xls  
Prep Batch: 1588469  
Prep Date: 08/19/2016 00:00

Method: SRTOT\_SEP\_PRECIP\_GPC  
Analyst: KSD1  
Aliquot: 0.441 g  
Prep Method: EPA 905.0 Modified/DOE RP5

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-004  
Instrument: PIC9B  
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	0.127	pCi/g	+/-0.411	0.412	0.765	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.10	7.37	mg	96.4	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "As Received"
Batch ID: 1585659	Method: I129_SEP_LEPS_GS	SOP Ref: GL-RAD-A-006
Run Date: 08/22/2016 11:53	Analyst: MJH1	Instrument: XRAY4
Data File: I402941001.CNF;1	Aliquot: 1.256 g	Count Time: 60 min
Prep Batch: 1585659	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 08/19/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.0951	pCi/g	+/-0.568	0.570	1.17	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941  
 Lab Sample ID: 402941001  
 Client ID: B35XJ1  
 Batch ID: 1587994  
 Run Date: 09/01/2016 08:58  
 Data File: G402941001.CNF;2  
 Prep Batch: 1587994  
 Prep Date: 08/11/2016 00:00

Client: CPRC001  
 Date Collected: 07/28/2016 15:15  
 Date Received: 08/03/2016 09:15  
 Method: GAMMA\_GS  
 Analyst: RXF2  
 Aliquot: 137.82 g  
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F16028  
 Matrix: SOIL  
 %Moisture: 17.2  
 Prep Basis: "Dry Weight Corrected"  
 SOP Ref: GL-RAD-A-013  
 Instrument: GAM11  
 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	0.0112	pCi/g	+/-0.0155	0.0163	0.0251	0.100
10198-40-0	Cobalt-60	U	0.00191	pCi/g	+/-0.0113	0.0113	0.0208	0.100
14683-23-9	Europium-152	U	0.00143	pCi/g	+/-0.0278	0.0278	0.0519	0.100
15585-10-1	Europium-154	U	0.0397	pCi/g	+/-0.0378	0.0418	0.0726	0.100
14391-16-3	Europium-155	UX	0.00	pCi/g	+/-0.0622	0.0627	0.052	0.100
13982-63-3	Radium-226		0.769	pCi/g	+/-0.0546	0.0638	0.0394	1.00
15262-20-1	Radium-228		1.18	pCi/g	+/-0.122	0.136	0.0738	3.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "As Received"
Batch ID: 1588132	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 08/17/2016 09:36	Analyst: CXS7	Instrument: LSCGOLD
Data File: E1588132.xls	Aliquot: 1.299 g	Count Time: 20 min
Prep Batch: 1588132	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 08/11/2016 13:02		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-2.39	pCi/g	+/-1.95	1.95	3.54	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	25000	31800	CPM	78.5	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "As Received"
Batch ID: 1588489	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 08/18/2016 09:44	Analyst: TXJ1	Instrument: LSCYELLOW
Data File: C1588489.xls	Aliquot: 0.55 g	Count Time: 45.0166664123535 min
Prep Batch: 1588489	Prep Method: EPA EERF C-01 Modified	
Prep Date: 08/17/2016 16:16		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	1.56	pCi/g	+/-1.64	1.64	2.74	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "As Received"
Batch ID: 1588517	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 08/18/2016 03:20	Analyst: TXJ1	Instrument: LSCGOLD
Data File: T1588517R3.xls	Aliquot: 1.28 g	Count Time: 60 min
Prep Batch: 1588517	Prep Method: EPA 906.0 Modified	
Prep Date: 08/15/2016 15:12		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	0.313	pCi/g	+/-7.82	7.82	13.7	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: GEL402941  
Lab Sample ID: 402941001

Client: CPRC001  
Date Collected: 07/28/2016 15:15  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 17.2

Client ID: B35XJ1  
Batch ID: 1591683  
Run Date: 08/23/2016 14:04  
Data File: N1591683.xls  
Prep Batch: 1591683  
Prep Date: 08/22/2016 09:39

Method: NI63\_LSC  
Analyst: CXS7  
Aliquot: 0.558 g  
Prep Method: DOE RESL Ni-1, Modified

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-022  
Instrument: LSCBROWN  
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	-2.6	pCi/g	+/-3.03	3.03	5.47	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	20.2	24.6	mg	82.2	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941001	Date Collected: 07/28/2016 15:15	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 17.2
Client ID: B35XJ1		Prep Basis: "As Received"
Batch ID: 1587569	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 08/10/2016 16:25	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1587569		
Prep Date: 08/10/2016 16:25		

CAS No.	Parmname	Qual	Result	Units	MDC
%MOISTURE	Moisture		17.2	percent +/-	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - 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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587947	Method: AMCMISO_EIE_PREC_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1099
Data File: S0402941002_AM.1A.gcnf	Aliquot: 0.102 g	Count Time: 240 min
Prep Batch: 1587947	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.017	pCi/g	+/-0.178	0.178	0.371	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	18.3	21.0	pCi/g	87.4	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941  
Lab Sample ID: 402941002

Client: CPRC001  
Date Collected: 08/01/2016 13:40  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 12.8

Client ID: B35XJ3  
Batch ID: 1587948  
Run Date: 08/18/2016 09:39  
Data File: S0402941002\_PU.1A.gcnf  
Prep Batch: 1587948  
Prep Date: 08/16/2016 00:00

Method: PUIISO\_PRECIP\_AEA  
Analyst: HAKB  
Aliquot: 0.102 g  
Prep Method: DOE EML HASL-300, Pu-11-

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-011  
Instrument: 1107  
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	0.0943	pCi/g	+/-0.260	0.260	0.450	1.00
OER-100-70	Plutonium-239/240	U	0.112	pCi/g	+/-0.257	0.258	0.408	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	15.5	19.4	pCi/g	79.9	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587949	Method: UIISO_IE_PRECIP_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:12	Analyst: HAKB	Instrument: 1113
Data File: S0402941002_UU.1A.gcnf	Aliquot: 0.102 g	Count Time: 240 min
Prep Batch: 1587949	Prep Method: DOE EML HASL-300, U-02-R	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

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	0.293	pCi/g	+/-0.434	0.436	0.634	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.00	pCi/g	+/-0.240	0.240	0.357	1.00
7440-61-1	Uranium-238	U	0.462	pCi/g	+/-0.511	0.516	0.675	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	15.8	20.4	pCi/g	77.6	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma). The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587950	Method: ASTM C 1475-00 Modified	SOP Ref: GL-RAD-A-032
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1066
Data File: S0402941002_NP.1A.gcnf	Aliquot: 0.1 g	Count Time: 240 min
Prep Batch: 1587950	Prep Method: ASTM C 1475-00 Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	0.108	pCi/g	+/-0.285	0.285	0.512	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1790	2010	pCi/g	89.2	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587951	Method: THISO_IE_PRECIP_AEA	SOP Ref: GL-RAD-A-038
Run Date: 08/18/2016 09:28	Analyst: HAKB	Instrument: 1195
Data File: S0402941002_TH.1A.gcnf	Aliquot: 0.103 g	Count Time: 240 min
Prep Batch: 1587951	Prep Method: DOE EML HASL-300, Th-01-	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
TH-232 <small>7440-29-1</small>	Thorium-232	U	0.263	pCi/g	+/-0.298	0.300	0.278	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Thorium-229 Tracer	20.2	19.7	pCi/g	102	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma). The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941  
Lab Sample ID: 402941002

Client: CPRC001  
Date Collected: 08/01/2016 13:40  
Date Received: 08/03/2016 09:15

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 12.8

Client ID: B35XJ3  
Batch ID: 1588469  
Run Date: 08/22/2016 17:20  
Data File: S1588469r2.xls  
Prep Batch: 1588469  
Prep Date: 08/19/2016 00:00

Method: SRTOT\_SEP\_PRECIP\_GPC  
Analyst: KSD1  
Aliquot: 0.44 g  
Prep Method: EPA 905.0 Modified/DOE RP5

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-004  
Instrument: PIC9C  
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	0.244	pCi/g	+/-0.633	0.636	1.13	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.60	7.37	mg	89.6	(40%-110%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "As Received"
Batch ID: 1585659	Method: I129_SEP_LEPS_GS	SOP Ref: GL-RAD-A-006
Run Date: 08/22/2016 11:53	Analyst: MJH1	Instrument: XRAY6
Data File: I402941002.CNF;1	Aliquot: 1.561 g	Count Time: 60 min
Prep Batch: 1585659	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 08/19/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.00886	pCi/g	+/-0.263	0.263	0.664	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 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: GEL402941  
 Lab Sample ID: 402941002  
  
 Client ID: B35XJ3  
 Batch ID: 1587994  
 Run Date: 09/01/2016 08:58  
 Data File: G402941002.CNF;2  
 Prep Batch: 1587994  
 Prep Date: 08/11/2016 00:00

Client: CPRC001  
 Date Collected: 08/01/2016 13:40  
 Date Received: 08/03/2016 09:15  
  
 Method: GAMMA\_GS  
 Analyst: RXF2  
 Aliquot: 154.46 g  
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F16028  
 Matrix: SOIL  
 %Moisture: 12.8  
  
 Prep Basis: "Dry Weight Corrected"  
 SOP Ref: GL-RAD-A-013  
 Instrument: GAM12  
 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	-0.0162	pCi/g	+/-0.0198	0.0212	0.0356	0.100
10198-40-0	Cobalt-60	U	0.0173	pCi/g	+/-0.020	0.0215	0.0449	0.100
14683-23-9	Europium-152	U	0.0375	pCi/g	+/-0.0639	0.0661	0.113	0.100
15585-10-1	Europium-154	U	-0.0125	pCi/g	+/-0.0711	0.0713	0.133	0.100
14391-16-3	Europium-155	U	0.0087	pCi/g	+/-0.0632	0.0633	0.123	0.100
13982-63-3	Radium-226		0.447	pCi/g	+/-0.101	0.107	0.0778	1.00
15262-20-1	Radium-228		0.590	pCi/g	+/-0.202	0.216	0.160	3.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "As Received"
Batch ID: 1588132	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 08/17/2016 09:58	Analyst: CXS7	Instrument: LSCGOLD
Data File: E1588132.xls	Aliquot: 1.236 g	Count Time: 20 min
Prep Batch: 1588132	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 08/11/2016 13:02		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-1.97	pCi/g	+/-2.30	2.30	4.13	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	22400	31800	CPM	70.4	(30%-105%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "As Received"
Batch ID: 1588489	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 08/18/2016 10:30	Analyst: TXJ1	Instrument: LSCYELLOW
Data File: C1588489.xls	Aliquot: 0.54 g	Count Time: 45 min
Prep Batch: 1588489	Prep Method: EPA EERF C-01 Modified	
Prep Date: 08/17/2016 16:16		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	1.22	pCi/g	+/-1.66	1.66	2.80	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.  
 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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "As Received"
Batch ID: 1588517	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 08/18/2016 05:33	Analyst: TXJ1	Instrument: LSCGOLD
Data File: T1588517R3.xls	Aliquot: 1.31 g	Count Time: 60 min
Prep Batch: 1588517	Prep Method: EPA 906.0 Modified	
Prep Date: 08/15/2016 15:12		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-1.53	pCi/g	+/-7.62	7.62	13.5	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.  
 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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "Dry Weight Corrected"
Batch ID: 1591683	Method: NI63_LSC	SOP Ref: GL-RAD-A-022
Run Date: 08/23/2016 14:35	Analyst: CXS7	Instrument: LSCBROWN
Data File: N1591683.xls	Aliquot: 0.511 g	Count Time: 30 min
Prep Batch: 1591683	Prep Method: DOE RESL Ni-1, Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/22/2016 09:39		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	-0.269	pCi/g	+/-3.52	3.52	6.16	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	20.2	24.6	mg	82.2	(40%-110%)

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941002	Date Collected: 08/01/2016 13:40	Matrix: SOIL
	Date Received: 08/03/2016 09:15	%Moisture: 12.8
Client ID: B35XJ3		Prep Basis: "As Received"
Batch ID: 1589767	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 08/12/2016 11:46	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1589767		
Prep Date: 08/12/2016 11:46		

CAS No.	Parmname	Qual	Result	Units	MDC
%MOISTURE	Moisture		12.7	percent +/-	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. 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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587947	Method: AMCMISO_EIE_PREC_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1100
Data File: S0402941003_AM.1A.gcnf	Aliquot: 0.107 g	Count Time: 240 min
Prep Batch: 1587947	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.182	pCi/g	+/-0.324	0.325	0.526	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	16.0	20.0	pCi/g	80.1	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587948	Method: PUIISO_PRECIP_AEA	SOP Ref: GL-RAD-A-011
Run Date: 08/18/2016 09:39	Analyst: HAKB	Instrument: 1108
Data File: S0402941003_PU.1A.gcnf	Aliquot: 0.107 g	Count Time: 239.9998 min
Prep Batch: 1587948	Prep Method: DOE EML HASL-300, Pu-11-	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	-0.102	pCi/g	+/-0.164	0.164	0.523	1.00
OER-100-70	Plutonium-239/240	U	-0.0509	pCi/g	+/-0.154	0.154	0.431	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	13.1	18.5	pCi/g	70.8	(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: GEL402941  
Lab Sample ID: 402941003

Client: CPRC001  
Date Collected: 08/02/2016 08:58  
Date Received: 08/04/2016 09:05

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 14.7

Client ID: B35XJ5  
Batch ID: 1587949  
Run Date: 08/18/2016 09:12  
Data File: S0402941003\_UU.1A.gcnf  
Prep Batch: 1587949  
Prep Date: 08/16/2016 00:00

Method: UIISO\_IE\_PRECIP\_AEA  
Analyst: HAKB  
Aliquot: 0.107 g  
Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-011  
Instrument: 1114  
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	0.589	pCi/g	+/-0.619	0.626	0.888	1.00
15117-96-1/13982-7	Uranium-235/236	U	0.357	pCi/g	+/-0.470	0.473	0.357	1.00
7440-61-1	Uranium-238		1.11	pCi/g	+/-0.685	0.707	0.533	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	14.1	19.5	pCi/g	72.4	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "Dry Weight Corrected"
Batch ID: 1587950	Method: ASTM C 1475-00 Modified	SOP Ref: GL-RAD-A-032
Run Date: 08/18/2016 09:38	Analyst: HAKB	Instrument: 1072
Data File: S0402941003_NP.1A.gcnf	Aliquot: 0.104 g	Count Time: 240 min
Prep Batch: 1587950	Prep Method: ASTM C 1475-00 Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/16/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0633	pCi/g	+/-0.147	0.147	0.434	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1660	1930	pCi/g	85.7	(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: GEL402941  
Lab Sample ID: 402941003

Client: CPRC001  
Date Collected: 08/02/2016 08:58  
Date Received: 08/04/2016 09:05

Project: CPRC0F16028  
Matrix: SOIL  
%Moisture: 14.7

Client ID: B35XJ5  
Batch ID: 1594561  
Run Date: 08/31/2016 23:18  
Data File: S0402941003\_TH.3A.gcnf  
Prep Batch: 1594561  
Prep Date: 08/30/2016 00:00

Method: THISO\_IE\_PRECIP\_AEA  
Analyst: MXS2  
Aliquot: 0.104 g  
Prep Method: DOE EML HASL-300, Th-01-

Prep Basis: "Dry Weight Corrected"  
SOP Ref: GL-RAD-A-038  
Instrument: 1028  
Count Time: 239.9998 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	U	0.211	pCi/g	+/-0.268	0.270	0.333	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Actinium-227 Tracer	13.8	13.4	pCi/g	103	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "Dry Weight Corrected"
Batch ID: 1592814	Method: SRTOT_SEP_PRECIP_GPC	SOP Ref: GL-RAD-A-004
Run Date: 08/30/2016 12:56	Analyst: KSD1	Instrument: PIC6A
Data File: S1592814.xls	Aliquot: 0.465 g	Count Time: 60 min
Prep Batch: 1592814	Prep Method: EPA 905.0 Modified/DOE RP5	Prep SOP Ref: GL-RAD-A-021
Prep Date: 08/29/2016 10:23		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
SR-RAD	Total Strontium	U	-0.623	pCi/g	+/-0.662	0.662	1.37	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.10	7.37	mg	82.8	(40%-110%)

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "As Received"
Batch ID: 1585659	Method: I129_SEP_LEPS_GS	SOP Ref: GL-RAD-A-006
Run Date: 08/22/2016 12:26	Analyst: MJH1	Instrument: XRAY5
Data File: I402941003.CNF;1	Aliquot: 1.471 g	Count Time: 60 min
Prep Batch: 1585659	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 08/19/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.0118	pCi/g	+/-0.415	0.415	0.955	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941  
 Lab Sample ID: 402941003  
  
 Client ID: B35XJ5  
 Batch ID: 1587994  
 Run Date: 09/01/2016 08:59  
 Data File: G402941003.CNF;2  
 Prep Batch: 1587994  
 Prep Date: 08/11/2016 00:00

Client: CPRC001  
 Date Collected: 08/02/2016 08:58  
 Date Received: 08/04/2016 09:05  
  
 Method: GAMMA\_GS  
 Analyst: RXF2  
 Aliquot: 159.04 g  
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F16028  
 Matrix: SOIL  
 %Moisture: 14.7  
  
 Prep Basis: "Dry Weight Corrected"  
 SOP Ref: GL-RAD-A-013  
 Instrument: GAM14  
 Count Time: 150 min  
 Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	-0.00715	pCi/g	+/-0.0184	0.0187	0.0315	0.100
10198-40-0	Cobalt-60	U	-0.0101	pCi/g	+/-0.0185	0.0191	0.0331	0.100
14683-23-9	Europium-152	U	0.00327	pCi/g	+/-0.0407	0.0407	0.0796	0.100
15585-10-1	Europium-154	U	-0.0171	pCi/g	+/-0.0504	0.051	0.0933	0.100
14391-16-3	Europium-155	U	0.0229	pCi/g	+/-0.0484	0.0496	0.0934	0.100
13982-63-3	Radium-226		0.416	pCi/g	+/-0.0887	0.0953	0.0575	1.00
15262-20-1	Radium-228	UX	0.00	pCi/g	+/-0.146	0.342	0.273	3.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "As Received"
Batch ID: 1588132	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 08/17/2016 10:19	Analyst: CXS7	Instrument: LSCGOLD
Data File: E1588132.xls	Aliquot: 1.388 g	Count Time: 20 min
Prep Batch: 1588132	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 08/11/2016 13:02		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-0.639	pCi/g	+/-1.93	1.93	3.39	5.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24300	31800	CPM	76.3	(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: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "As Received"
Batch ID: 1588489	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 08/18/2016 11:16	Analyst: TXJ1	Instrument: LSCYELLOW
Data File: C1588489.xls	Aliquot: 0.55 g	Count Time: 45 min
Prep Batch: 1588489	Prep Method: EPA EERF C-01 Modified	
Prep Date: 08/17/2016 16:16		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	1.54	pCi/g	+/-1.62	1.63	2.72	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: GEL402941  
 Lab Sample ID: 402941003  
 Client ID: B35XJ5  
 Batch ID: 1588517  
 Run Date: 08/18/2016 06:36  
 Data File: T1588517R3.xls  
 Prep Batch: 1588517  
 Prep Date: 08/15/2016 15:12

Client: CPRC001  
 Date Collected: 08/02/2016 08:58  
 Date Received: 08/04/2016 09:05  
 Method: TRITIUM\_DIST\_LSC  
 Analyst: TXJ1  
 Aliquot: 1.34 g  
 Prep Method: EPA 906.0 Modified

Project: CPRC0F16028  
 Matrix: SOIL  
 %Moisture: 14.7  
 Prep Basis: "As Received"  
 SOP Ref: GL-RAD-A-002  
 Instrument: LSCGOLD  
 Count Time: 60 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-1.05	pCi/g	+/-7.18	7.18	12.7	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: GEL402941  
 Lab Sample ID: 402941003  
  
 Client ID: B35XJ5  
 Batch ID: 1591683  
 Run Date: 08/23/2016 15:07  
 Data File: N1591683.xls  
 Prep Batch: 1591683  
 Prep Date: 08/22/2016 09:39

Client: CPRC001  
 Date Collected: 08/02/2016 08:58  
 Date Received: 08/04/2016 09:05  
  
 Method: NI63\_LSC  
 Analyst: CXS7  
 Aliquot: 0.586 g  
 Prep Method: DOE RESL Ni-1, Modified

Project: CPRC0F16028  
 Matrix: SOIL  
 %Moisture: 14.7  
  
 Prep Basis: "Dry Weight Corrected"  
 SOP Ref: GL-RAD-A-022  
 Instrument: LSCBROWN  
 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	0.573	pCi/g	+/-3.12	3.12	5.40	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	20.1	24.6	mg	81.8	(40%-110%)

**Comments:**

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL402941	Client: CPRC001	Project: CPRC0F16028
Lab Sample ID: 402941003	Date Collected: 08/02/2016 08:58	Matrix: SOIL
	Date Received: 08/04/2016 09:05	%Moisture: 14.7
Client ID: B35XJ5		Prep Basis: "As Received"
Batch ID: 1589767	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 08/12/2016 11:46	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1589767		
Prep Date: 08/12/2016 11:46		

CAS No.	Parmname	Qual	Result	Units	MDC
%MOISTURE	Moisture		18.4	percent +/-	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

**Comments:**

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

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: September 2, 2016  
Page 1 of 8

**Client :** CH2MHill Plateau Remediation Company  
MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352  
**Contact:** Mr. Scot Fitzgerald  
**Workorder:** 402941

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Gravimetric Solids</b>									
Batch	1589767								
QC1203605963	402941002	DUP							
Moisture		12.7		12.0	percent	RPD: 6	(0%-20%)	CXC1	08/12/1611:46
<b>Rad Alpha Spec</b>									
Batch	1587947								
QC1203600136	MB								
Americium-241			U	-0.0519	pCi/g			HAKB	08/18/1609:38
				Uncert: +/-0.120					
				TPU: +/-0.120					
**Americium-243 Tracer	16.6			13.4	pCi/g	REC: 81	(30%-105%)		
				Uncert: +/-1.85					
				TPU: +/-2.84					
QC1203600137	402941001	DUP							
Americium-241		U	0.0217	U	-0.026	pCi/g			
				Uncert: +/-0.227		RPD: 0	N/A		
				TPU: +/-0.227		RER: 0.367	(0-2)		
**Americium-243 Tracer	16.7	8.94		14.1	pCi/g	REC: 84	(30%-105%)		
				Uncert: +/-2.22					
				TPU: +/-3.32					
QC1203600138	LCS								
Americium-241		15.3		16.8	pCi/g	REC: 110	(80%-120%)		
				Uncert: +/-1.86					
				TPU: +/-2.86					
**Americium-243 Tracer	16.6			13.4	pCi/g	REC: 81	(30%-105%)		
				Uncert: +/-1.84					
				TPU: +/-2.82					
Batch	1587948								
QC1203600139	MB								
Plutonium-238			U	0.0741	pCi/g			HAKB	08/18/1609:39
				Uncert: +/-0.170					
				TPU: +/-0.170					
Plutonium-239/240			U	0.0136	pCi/g				
				Uncert: +/-0.143					
				TPU: +/-0.143					
**Plutonium-242 Tracer	15.3			12.7	pCi/g	REC: 83	(30%-105%)		
				Uncert: +/-1.70					
				TPU: +/-2.55					
QC1203600140	402941001	DUP							
Plutonium-238		U	0.0631	U	-0.0458	pCi/g			
				Uncert: +/-0.177		RPD: 0	N/A		
				TPU: +/-0.178		RER: 0.947	(0-2)		
Plutonium-239/240		U	0.0479	U	0.00254	pCi/g			
				Uncert: +/-0.180		RPD: 0	N/A		
				TPU: +/-0.180		RER: 0.341	(0-2)		

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 2 of 8

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Alpha Spec</b>									
Batch	1587948								
**Plutonium-242 Tracer	15.4	10.9		11.1	pCi/g	REC: 72	(30%-105%)		
	Uncert:	+/-1.93		+/-1.95					
	TPU:	+/-2.87		+/-2.89					
QC1203600141 LCS									
Plutonium-238			U	-0.0658	pCi/g				
	Uncert:			+/-0.125					
	TPU:			+/-0.125					
Plutonium-239/240	15.3			16.8	pCi/g	REC: 110	(80%-120%)		
	Uncert:			+/-1.89					
	TPU:			+/-2.89					
**Plutonium-242 Tracer	15.3			11.9	pCi/g	REC: 78	(30%-105%)		
	Uncert:			+/-1.80					
	TPU:			+/-2.69					
Batch	1587949								
QC1203600142 MB									
Uranium-233/234			U	0.00493	pCi/g			HAKB	08/18/1609:12
	Uncert:			+/-0.226					
	TPU:			+/-0.227					
Uranium-235/236			U	-0.0183	pCi/g				
	Uncert:			+/-0.158					
	TPU:			+/-0.158					
Uranium-238			U	0.00246	pCi/g				
	Uncert:			+/-0.183					
	TPU:			+/-0.183					
**Uranium-232 Tracer	16.1			14.9	pCi/g	REC: 92	(30%-105%)		
	Uncert:			+/-1.98					
	TPU:			+/-3.05					
QC1203600143 402941001 DUP									
Uranium-233/234		1.55		1.05	pCi/g				08/18/1609:12
	Uncert:	+/-0.586		+/-0.641		RPD: 39	(0% - 100%)		
	TPU:	+/-0.622		+/-0.662		RER: 1.09	(0-2)		
Uranium-235/236		U 0.195	U	0.103	pCi/g				
	Uncert:	+/-0.256		+/-0.289		RPD: 45	N/A		
	TPU:	+/-0.258		+/-0.290		RER: 0.464	(0-2)		
Uranium-238		1.16		0.689	pCi/g				
	Uncert:	+/-0.507		+/-0.522		RPD: 51	(0% - 100%)		
	TPU:	+/-0.530		+/-0.533		RER: 1.22	(0-2)		
**Uranium-232 Tracer	16.3	13.0		11.5	pCi/g	REC: 71	(30%-105%)		
	Uncert:	+/-1.82		+/-2.30					
	TPU:	+/-2.84		+/-3.47					
QC1203600144 LCS									
Uranium-233/234				22.1	pCi/g				08/18/1609:12
	Uncert:			+/-2.47					
	TPU:			+/-4.14					
Uranium-235/236				1.43	pCi/g				
	Uncert:			+/-0.736					
	TPU:			+/-0.767					
Uranium-238	20.9			24.0	pCi/g	REC: 115	(80%-120%)		
	Uncert:			+/-2.57					
	TPU:			+/-4.43					

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 3 of 8

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Alpha Spec</b>									
Batch	1587949								
**Uranium-232 Tracer	16.1			12.6	pCi/g	REC: 78 (30%-105%)			
	Uncert:			+/-2.11					
	TPU:			+/-3.22					
Batch	1587950								
QC1203600145 MB									
Neptunium-237			U	0.0977	pCi/g			HAKB	08/18/1609:28
	Uncert:			+/-0.269					
	TPU:			+/-0.269					
**Americium-243 Tracer	1860			1630	pCi/g	REC: 88 (30%-105%)			
QC1203600146 402941001 DUP									
Neptunium-237		U	-0.0806	U 0.038	pCi/g				08/18/1609:38
	Uncert:		+/-0.153	+/-0.245		RPD: 0 N/A			
	TPU:		+/-0.153	+/-0.245		RER: 0.804 (0-2)			
**Americium-243 Tracer	1910		1840	1510	pCi/g	REC: 79 (30%-105%)			
QC1203600147 LCS									
Neptunium-237	41.3			46.1	pCi/g	REC: 112 (80%-120%)			
	Uncert:			+/-3.25					
	TPU:			+/-6.01					
**Americium-243 Tracer	1860			1780	pCi/g	REC: 96 (30%-105%)			
Batch	1587951								
QC1203600148 MB									
Thorium-232			U	-0.025	pCi/g			HAKB	08/18/1609:28
	Uncert:			+/-0.153					
	TPU:			+/-0.153					
**Thorium-229 Tracer	18.6			17.1	pCi/g	REC: 92 (30%-105%)			
	Uncert:			+/-2.31					
	TPU:			+/-3.66					
QC1203600149 402941001 DUP									
Thorium-232			0.644	0.586	pCi/g				08/18/1609:28
	Uncert:		+/-0.478	+/-0.422		RPD: 9 (0% - 100%)			
	TPU:		+/-0.488	+/-0.432		RER: 0.173 (0-2)			
**Thorium-229 Tracer	18.6		17.7	18.3	pCi/g	REC: 98 (30%-105%)			
	Uncert:		+/-2.36	+/-2.22					
	TPU:		+/-3.74	+/-3.55					
QC1203600150 LCS									
Thorium-232	18.2			20.5	pCi/g	REC: 113 (80%-120%)			08/18/1609:28
	Uncert:			+/-2.97					
	TPU:			+/-4.69					
**Thorium-229 Tracer	18.6			10.8	pCi/g	REC: 58 (30%-105%)			
	Uncert:			+/-2.85					
	TPU:			+/-4.36					
Batch	1594561								
QC1203617115 MB									
Thorium-232			U	-0.013	pCi/g			MXS2	08/31/1623:18
	Uncert:			+/-0.112					
	TPU:			+/-0.112					
**Actinium-227 Tracer	13.4			12.9	pCi/g	REC: 96 (30%-105%)			
	Uncert:			+/-1.73					
	TPU:			+/-2.62					

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 4 of 8

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Alpha Spec</b>									
Batch	1594561								
QC1203617116	402941003	DUP							
Thorium-232		U	0.211	0.712	pCi/g				09/01/1609:58
		Uncert:	+/-0.268	+/-0.600		RPD:	73 (0% - 100%)		
		TPU:	+/-0.270	+/-0.614		RER:	1.46 (0-2)		
**Actinium-227 Tracer	13.9	13.8	12.0	12.0	pCi/g	REC:	86 (30%-105%)		
		Uncert:	+/-1.87	+/-2.49					
		TPU:	+/-2.80	+/-3.66					
QC1203617117	LCS								
Thorium-232	19.1			20.1	pCi/g	REC:	105 (80%-120%)		09/01/1609:58
		Uncert:		+/-2.83					
		TPU:		+/-4.68					
**Actinium-227 Tracer	13.5			11.7	pCi/g	REC:	87 (30%-105%)		
		Uncert:		+/-2.41					
		TPU:		+/-3.54					
<b>Rad Gamma Spec</b>									
Batch	1585659								
QC1203594530	MB								
Iodine-129			U	-0.191	pCi/g			MJH1	08/22/1612:30
		Uncert:		+/-0.373					
		TPU:		+/-0.383					
QC1203594531	402432001	DUP							
Iodine-129		U	0.435	0.0841	pCi/g				08/22/1612:30
		Uncert:	+/-0.415	+/-0.357		RPD:	0 N/A		
		TPU:	+/-0.461	+/-0.359		RER:	1.18 (0-2)		
QC1203594532	402432001	MS							
Iodine-129	31.9	U	0.435	33.6	pCi/g	REC:	105 (75%-125%)		08/22/1613:08
		Uncert:	+/-0.415	+/-3.62					
		TPU:	+/-0.461	+/-4.89					
QC1203594533	LCS								
Iodine-129	26.3			27.8	pCi/g	REC:	106 (80%-120%)		08/22/1613:08
		Uncert:		+/-3.37					
		TPU:		+/-4.37					
Batch	1587994								
QC1203600272	MB								
Cesium-137			U	0.00493	pCi/g			RXF2	09/01/1608:59
		Uncert:		+/-0.0175					
		TPU:		+/-0.0177					
Cobalt-60			U	0.00955	pCi/g				
		Uncert:		+/-0.0127					
		TPU:		+/-0.0134					
Europium-152			U	0.0251	pCi/g				
		Uncert:		+/-0.0453					
		TPU:		+/-0.0467					
Europium-154			U	0.0301	pCi/g				
		Uncert:		+/-0.0416					
		TPU:		+/-0.0437					
Europium-155			U	-0.000868	pCi/g				
		Uncert:		+/-0.042					
		TPU:		+/-0.042					
Radium-226			U	-0.00105	pCi/g				

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 5 of 8

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Gamma Spec</b>									
Batch	1587994								
Radium-228				Uncert: +/-0.0393 TPU: +/-0.0393					
			U	0.0189	pCi/g				
				Uncert: +/-0.0737 TPU: +/-0.0742					
QC1203600273 402941001 DUP Cesium-137		U 0.0112	U	0.0174	pCi/g				09/01/1609:00
		Uncert: +/-0.0155 TPU: +/-0.0163		+/-0.0235 +/-0.0248		RPD: 0 RER: 0.412	N/A (0-2)		
Cobalt-60		U 0.00191	U	-0.000809	pCi/g				
		Uncert: +/-0.0113 TPU: +/-0.0113		+/-0.0208 +/-0.0208		RPD: 0 RER: 0.225	N/A (0-2)		
Europium-152		U 0.00143	U	0.0506	pCi/g				
		Uncert: +/-0.0278 TPU: +/-0.0278		+/-0.0549 +/-0.0595		RPD: 0 RER: 1.47	N/A (0-2)		
Europium-154		U 0.0397	U	0.0113	pCi/g				
		Uncert: +/-0.0378 TPU: +/-0.0418		+/-0.0698 +/-0.070		RPD: 0 RER: 0.681	N/A (0-2)		
Europium-155		UX 0.00	U	-0.0497	pCi/g				
		Uncert: +/-0.0622 TPU: +/-0.0627		+/-0.0667 +/-0.0705		RPD: 0 RER: 3.39	N/A (0-2)		
Radium-226		0.769		0.695	pCi/g				
		Uncert: +/-0.0546 TPU: +/-0.0638		+/-0.121 +/-0.125		RPD: 10 RER: 1.05	(0% - 20%) (0-2)		
Radium-228		1.18		1.10	pCi/g				
		Uncert: +/-0.122 TPU: +/-0.136		+/-0.197 +/-0.205		RPD: 7 RER: 0.653	(0% - 20%) (0-2)		
QC1203600274 LCS Americium-241		489		521	pCi/g	REC: 106	(80%-120%)		09/01/1609:00
		Uncert: +/-7.36 TPU: +/-38.8							
Cesium-137		180		189	pCi/g	REC: 105	(80%-120%)		
		Uncert: +/-3.17 TPU: +/-8.68							
Cobalt-60		164		155	pCi/g	REC: 95	(80%-120%)		
		Uncert: +/-3.35 TPU: +/-6.60							
Europium-152			U	1.02	pCi/g				
		Uncert: +/-1.41 TPU: +/-1.49							
Europium-154			U	0.0687	pCi/g				
		Uncert: +/-0.852 TPU: +/-0.853							
Europium-155			U	-0.431	pCi/g				
		Uncert: +/-1.05 TPU: +/-1.07							
Radium-226			U	0.423	pCi/g				
		Uncert: +/-0.951 TPU: +/-0.970							
Radium-228			U	-1.16	pCi/g				

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 6 of 8

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Gamma Spec</b>									
Batch	1587994								
				Uncert:					
				TPU:					
<b>Rad Gas Flow</b>									
Batch	1588469								
QC1203601566	MB								
Total Strontium			U	-0.201	pCi/g			KSD1	08/23/1610:51
				Uncert:					
				TPU:					
**Strontium Carrier				7.37	6.60	mg	REC: 90 (40%-110%)		
QC1203601567	402432002	DUP							
Total Strontium		U	-0.276	U	0.387	pCi/g			08/22/1617:24
			Uncert:				RPD: 0 N/A		
			TPU:				RER: 1.31 (0-2)		
**Strontium Carrier			7.37	7.10	7.00	mg	REC: 95 (40%-110%)		
QC1203601568	LCS								
Total Strontium				45.3	47.3	pCi/g	REC: 104 (80%-120%)		08/22/1617:24
				Uncert:					
				TPU:					
**Strontium Carrier				7.37	6.80	mg	REC: 92 (40%-110%)		
Batch	1592814								
QC1203612718	MB								
Total Strontium			U	-1.17	pCi/g			KSD1	08/30/1612:56
				Uncert:					
				TPU:					
**Strontium Carrier				7.37	6.90	mg	REC: 94 (40%-110%)		
QC1203612719	402941003	DUP							
Total Strontium		U	-0.623	U	-0.204	pCi/g			08/30/1612:56
			Uncert:				RPD: 0 N/A		
			TPU:				RER: 0.867 (0-2)		
**Strontium Carrier			7.37	6.10	5.80	mg	REC: 79 (40%-110%)		
QC1203612720	LCS								
Total Strontium				46.9	46.3	pCi/g	REC: 99 (80%-120%)		08/30/1612:56
				Uncert:					
				TPU:					
**Strontium Carrier				7.37	6.80	mg	REC: 92 (40%-110%)		
<b>Rad Liquid Scintillation</b>									
Batch	1588132								
QC1203600560	MB								
Technetium-99			U	-0.696	pCi/g			CXS7	08/17/1610:41
				Uncert:					
				TPU:					
**Technetium-99m Tracer				31800	25200	CPM	REC: 79 (30%-105%)		
QC1203600561	402432001	DUP							
Technetium-99		U	-1.53	U	-1.6	pCi/g			08/17/1611:03
			Uncert:				RPD: 0 N/A		
			TPU:				RER: 0.0483 (0-2)		
**Technetium-99m Tracer				31800	27400	CPM	REC: 76 (30%-105%)		
QC1203600562	LCS								
Technetium-99				62.0	74.0	pCi/g	REC: 119 (80%-120%)		08/17/1611:24

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 7 of 8

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
<b>Rad Liquid Scintillation</b>									
Batch	1588132								
				Uncert:					
				TPU:					
**Technetium-99m Tracer	31800			24300	CPM	REC: 76	(30%-105%)		
Batch	1588489								
QC1203601657	MB								
Carbon-14			U	1.69	pCi/g			TXJ1	08/18/1612:03
				Uncert:					
				TPU:					
QC1203601658	402432001	DUP							
Carbon-14		U	1.23	U	0.652				08/18/1612:49
				Uncert:					
				TPU:					
						RPD: 0	N/A		
						RER: 0.525	(0-2)		
QC1203601659	402432001	MS							
Carbon-14		133	U	1.23	133	pCi/g	REC: 100	(75%-125%)	08/18/1613:35
				Uncert:					
				TPU:					
QC1203601660	LCS								
Carbon-14		124		127	pCi/g	REC: 102	(80%-120%)		08/18/1614:21
				Uncert:					
				TPU:					
Batch	1588517								
QC1203601770	MB								
Tritium			U	-3.78	pCi/g			TXJ1	08/18/1607:38
				Uncert:					
				TPU:					
QC1203601771	402432001	DUP							
Tritium		U	-5.81	U	0.214	pCi/g			08/18/1608:40
				Uncert:					
				TPU:					
						RPD: 0	N/A		
						RER: 1.11	(0-2)		
QC1203601772	402432001	MS							
Tritium		84.0	U	-5.81	73.0	pCi/g	REC: 87	(75%-125%)	08/18/1609:43
				Uncert:					
				TPU:					
QC1203601773	LCS								
Tritium		83.7		67.2	pCi/g	REC: 80	(80%-120%)		08/18/1610:45
				Uncert:					
				TPU:					
Batch	1591683								
QC1203609943	MB								
Nickel-63			U	-0.199	pCi/g			CXS7	08/23/1615:39
				Uncert:					
				TPU:					
**Nickel Carrier	24.6			20.7	mg	REC: 84	(40%-110%)		
QC1203609944	402432001	DUP							
Nickel-63		U	0.607	U	-0.434	pCi/g			08/23/1616:11
				Uncert:					
				TPU:					
						RPD: 0	N/A		
						RER: 0.373	(0-2)		
**Nickel Carrier	24.6		17.4	19.3	mg	REC: 79	(40%-110%)		
QC1203609945	LCS								
Nickel-63		230		218	pCi/g	REC: 95	(80%-120%)		08/23/1616:43

**GEL LABORATORIES LLC**

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

**QC Summary**

Workorder: 402941

Page 8 of 8

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch		1591683								
				Uncert:		+/-8.03				
				TPU:		+/-41.1				
**Nickel Carrier		24.6		20.1	mg	REC: 82	(40%-110%)			

**Notes:**

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

The Qualifiers in this report are defined as follows:

- \* Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The associated QC sample blank has a result  $\geq 2X$  the MDA and, after corrections, result is  $\geq$  MDA for this sample
- 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.
- 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.