GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

August 08, 2016

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

Re: CHPRC SAF S16-006
Work Order: 401494
SDG: GEL401494

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 13, 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: 300071 - 7H
Chain of Custody: S16-006-287
Enclosures

Table of Contents

Case Narrative.....1

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

Data Review Qualifier Definitions.....11

Laboratory Certifications.....13

Metals Analysis.....15

Case Narrative.....16

Sample Data Summary.....19

Quality Control Summary.....21

Radiological Analysis.....24

Case Narrative.....25

Sample Data Summary.....35

Quality Control Summary.....49

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S16-006
SDG: GEL401494

August 08, 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 July 13, 2016, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification
The laboratory received the following sample:

Laboratory Identification	Sample Description
401494001	B35CJ2

Case Narrative

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

Data Package

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

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

B. Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401494
Work Order #: 401494

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.

Calibration Information

CRDL/PQL Requirements
The CRDL standard recoveries for SW846 6020A/6020B met the advisory control limits with the exception of uranium. Client sample concentrations were greater than two times the PQL; therefore the data were not adversely affected.

Radiochemistry

AMCMISO_EIE_PRECIP_AEA: COMMON

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

NP237_IE_PRECIP_AEA: COMMON

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 1203587309 (B35CJ2DUP) and 401494001 (B35CJ2) were recounted due to high relative percent difference/relative error ratio. The recounts are reported.

PUISO_PRECIP_AEA:COMMON

All sample data provided in this report met the acceptance criteria specified in the analytical methods and

procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information
Refer to Data Exception Report (DER).

Miscellaneous Information

UISO_IE_PRECIP_AEA:COMMON

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

Technical Information

Recounts
Sample 1203587314 (MB) was recounted due to a suspected blank false positive. The recount is reported.

I129LL_SEP_LEPS_GS: COMMON (low level)

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 + GW 01

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.

9310_ALPHABETA_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

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame

until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1203586590 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203586588 (B35BY8MS) and 1203586589 (B35BY8MSD), aliquots were reduced to conserve sample volume.

SRISO_SEP_PRECIP_GPC: COMMON

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

Technical Information

Recounts
Sample 401494001 (B35CJ2) was verified by recounting at least five days from the separation date. The recount is reported.

PU241_IE_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.

Miscellaneous Information

SE79_SEP_IE_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 the quench number being outside the calibration range. The recounts are reported.

TC99_EIE_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 1203585993 (Non SDG 400884001DUP) and 401494001 (B35CJ2) were recounted to verify sample results. Recounts are reported.

TRITIUM_DIST_LSC: COMMON

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

C14_LSC: COMMON

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

Certification Statement

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

Chain of Custody and Supporting Documentation

73lbs

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

401494

C.O.C. # **S16-006-287**

Page 1 of 1

Collector	J.R. Aguilar/CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	S16-006	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071
Project Title	SURV, JUNE 2016	**Logbook No.**	HNF-N-506 85/90	**Ice Chest No.**	GWS-551
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7767 2444 7216
Protocol	SURV	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	6818

POSSIBLE SAMPLE HAZARDS/REMARKS

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35CJ2	N	W	JUL 12 2016	0832	1x500-mL G/P	6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B35CJ2	N	W			2x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x1-L G/P	AMCMISO_EIE_PRECIP_AEA: COMMON	180 Days	HNO3 to pH <2
B35CJ2	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35CJ2	N	W			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B35CJ2	N	W			2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35CJ2	N	W			1x1-L G/P	NP237_IE_PRECIP_AEA: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x1-L G/P	PU241_IE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x1-L G/P	PUISO_PLATE_AEA: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x1-L G/P	SE79_SEP_IE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CJ2	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35CJ2	N	W	JUL 12 2016	0832	3x1-L G/P	UISO_IE_PRECIP_AEA: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.R. Aguilar/CHPRC			JUL 12 2016 0930	Janelle Zunker CHPRC		Janelle Zunker	JUL 12 2016 0930
Janelle Zunker CHPRC			JUL 12 2016 1000	FEDEX			~~JUL 12 2016~~ 7-12-16
FX				M. Kristian		M. Kristian	7-13-16 0910

Matrix *

S	= Soil	DS	= Drum Solids		
SE	= Sediment	DL	= Drum Liquids		
SO	= Solid	T	= Tissue		
SL	= Sludge	WI	= Wipe		
W	= Water	L	= Liquid		
O	= Oil	V	= Vegetation		
A	= Air	X	= Other		

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

PRINTED ON 4/27/2016 FSR ID = FSR31665 A-6004-842 (REV 2)

8/9/2016

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	**SDG/AR/COC/Work Order:** 401494
Received By: MK	**Date Received:** 7-13-16

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 18C 19C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130462962 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		✓		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7767 1251 3125 18C 7767 2444 7216 19C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials BL Date 7-13-16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

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

Report Date: 08−AUG−16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol−condensation product	Organics	Semi−Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (0rganics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy−−Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 08 August 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 #: GEL401494
Work Order #: 401494

Product: **Determination of Metals by ICP-MS**
Analytical Method: 6020_METALS_ICPMS
Analytical Procedure: GL-MA-E-014 REV# 28
Analytical Batch: 1581658

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 13
Preparation Batch: 1581657

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203584645	Method Blank (MB)**ICP-MS**
1203584646	Laboratory Control Sample (LCS)
1203584649	401494001(B35CJ2L) Serial Dilution (SD)
1203584647	401494001(B35CJ2S) Matrix Spike (MS)
1203584648	401494001(B35CJ2SD) Matrix Spike Duplicate (MSD)

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.

Calibration Information

CRDL/PQL Requirements
The CRDL standard recoveries for SW846 6020A/6020B met the advisory control limits with the exception of uranium. Client sample concentrations were greater than two times the PQL; therefore the data were not adversely affected.

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: GEL401494 GEL Work Order: 401494

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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.

Review/Validation

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

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

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

Date: 09 AUG 2016 **Title: Data Validator**

Sample Data Summary

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL401494 **CONTRACT:** CPRC0S16006 **METHOD TYPE:** SW846

SAMPLE ID: 401494001 **BASIS:** As Received **DATE COLLECTED** 12−JUL−16

CLIENT ID: B35CJ2 **LEVEL:** Low **DATE RECEIVED** 13−JUL−16

MATRIX: WATER **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−61−1	Uranium	23.7	ug/L		0.067	0.2	15	1	MS	SKJ	07/28/16 21:45	160728−1	1581658

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1581658	1581657	SW846 3005A	50	mL	50	mL	07/14/16	SXW1

***Analytical Methods:**

MS **SW846 3005A/6020A**

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: August 9, 2016

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **401494**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1581658										
QC1203584646 LCS										
Uranium	50.0			50.6	ug/L		101	(80%-120%)	SKJ	07/28/16 21:33
QC1203584645 MB										
Uranium			U	0.067	ug/L					07/28/16 21:29
QC1203584647 401494001 MS										
Uranium	50.0	23.7		77.0	ug/L		107	(75%-125%)		07/28/16 21:49
QC1203584648 401494001 MSD										
Uranium	50.0	23.7		77.7	ug/L	0.831	108	(0%-20%)		07/28/16 21:53
QC1203584649 401494001 SDILT										
Uranium		23.7	D	5.18	ug/L	9.17		(0%-10%)		07/28/16 22:01

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: **401494**

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401494
Work Order #: 401494

Product: **AMCMISO_EIE_PRECIP_AEA: COMMON**
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1582736

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203587305	Method Blank (MB)
1203587306	401494001(B35CJ2) Sample Duplicate (DUP)
1203587307	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: **NP237_IE_PRECIP_AEA: COMMON**
Analytical Method: NP237_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-032 REV# 21
Analytical Batch: 1582737

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203587308	Method Blank (MB)
1203587309	401494001(B35CJ2) Sample Duplicate (DUP)
1203587310	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 1203587309 (B35CJ2DUP) and 401494001 (B35CJ2) were recounted due to high relative percent difference/relative error ratio. The recounts are reported.

Product: **PUISO_PRECIP_AEA:COMMON**
Analytical Method: PUISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1582738

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203587311	Method Blank (MB)
1203587312	401494001(B35CJ2) Sample Duplicate (DUP)
1203587313	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.

Miscellaneous Information

1. The Pu-242 tracer for sample 1203587312 does not meet the resolution requirements of having a full width half maximum of 100 keV or less. 1. The tracer peak is within the Pu-242 ROI and the tracer yield requirements do meet the client acceptance criteria. Reporting results.

Product: **UISO_IE_PRECIP_AEA:COMMON**
Analytical Method: UISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1582739

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203587314	Method Blank (MB)
1203587315	401494001(B35CJ2) Sample Duplicate (DUP)
1203587316	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Sample 1203587314 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Product: **I129LL_SEP_LEPS_GS: COMMON (low level)**
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1581778

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203584985	Method Blank (MB)
1203584986	401492001(NonSDG) Sample Duplicate (DUP)
1203584987	401492001(NonSDG) Matrix Spike (MS)
1203584988	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 + GW 01**
Analytical Method: 901.1_GAMMA_GS
Analytical Procedure: GL-RAD-A-013 REV# 25
Analytical Batch: 1581790

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203585022	Method Blank (MB)
1203585023	401494001(B35CJ2) Sample Duplicate (DUP)
1203585024	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: **9310_ALPHABETA_GPC: COMMON**
Analytical Method: 9310_ALPHABETA_GPC
Analytical Procedure: GL-RAD-A-001 REV# 18
Analytical Batch: 1582447

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203586586	Method Blank (MB)
1203586587	400886001(B35BY8) Sample Duplicate (DUP)
1203586588	400886001(B35BY8) Matrix Spike (MS)
1203586589	400886001(B35BY8) Matrix Spike Duplicate (MSD)
1203586590	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

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1203586590 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203586588 (B35BY8MS) and 1203586589 (B35BY8MSD), aliquots were reduced to conserve sample volume.

Product: **SRISO_SEP_PRECIP_GPC: COMMON**
Analytical Method: SRISO_SEP_PRECIP_GPC
Analytical Procedure: GL-RAD-A-004 REV# 17
Analytical Batch: 1582477

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203586675	Method Blank (MB)
1203586676	401516001(NonSDG) Sample Duplicate (DUP)
1203586677	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts
Sample 401494001 (B35CJ2) was verified by recounting at least five days from the separation date. The recount is reported.

Product: **PU241_IE_LSC: COMMON**
Analytical Method: PU241_IE_LSC
Analytical Procedure: GL-RAD-A-035 REV# 17
Analytical Batch: 1582740

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203587317	Method Blank (MB)
1203587318	401494001(B35CJ2) Sample Duplicate (DUP)
1203587319	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.

Miscellaneous Information

1. Sample 1203587318 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: **SE79_SEP_IE_LSC: COMMON**
Analytical Method: SE79_SEP_IE_LSC
Analytical Procedure: GL-RAD-A-031 REV# 11
Analytical Batch: 1582184

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203585985	Method Blank (MB)
1203585986	400884001(NonSDG) Sample Duplicate (DUP)
1203585987	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 the quench number being outside the calibration range. The recounts are reported.

Product: **TC99_EIE_LSC: COMMON**
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 4
Analytical Batch: 1582186

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203585992	Method Blank (MB)
1203585993	400884001(NonSDG) Sample Duplicate (DUP)
1203585994	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 1203585993 (Non SDG 400884001DUP) and 401494001 (B35CJ2) were recounted to verify sample results. Recounts are reported.

Product: **TRITIUM_DIST_LSC: COMMON**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 21
Analytical Batch: 1582195

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203586023	Method Blank (MB)
1203586024	400884001(NonSDG) Sample Duplicate (DUP)
1203586025	400884001(NonSDG) Matrix Spike (MS)
1203586026	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: 1583613

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

GEL Sample ID#	Client Sample Identification
401494001	B35CJ2
1203589378	Method Blank (MB)
1203589379	401206001(NonSDG) Sample Duplicate (DUP)
1203589380	401206001(NonSDG) Matrix Spike (MS)

1203589381 Laboratory Control Sample (LCS)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401494 GEL Work Order: 401494

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

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

Date: **09 AUG 2016** **Title:** **Group Leader**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582736**	**Method:**	**AMCMISO_EIE_PREC_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/20/2016 10:06**	**Analyst:**	**MXS2**	**Instrument:**	**1096**
Data File:	**S0401494001_AM.1A.gcnf**	**Aliquot:**	**0.4 L**	**Count Time:**	**239.9998 min**
Prep Batch:	**1582736**	**Prep Method:**	**DOE EML HASL-300, Am-05**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.030	pCi/L	+/-0.0597	0.0599	0.097	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	5.28	5.34	pCi/L	98.8	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582737**	**Method:**	**NP237_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-032**
Run Date:	**07/26/2016 16:06**	**Analyst:**	**MXS2**	**Instrument:**	**1207**
Data File:	**S0401494001_NP.2A.gcnf**	**Aliquot:**	**0.1 L**	**Count Time:**	**240 min**
Prep Batch:	**1582737**	**Prep Method:**	**ASTM C 1476-00 Modified**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0402	pCi/L	+/-0.178	0.178	0.464	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1740	2010	pCi/L	86.4	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582738**	**Method:**	**PUISO_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/20/2016 10:09**	**Analyst:**	**MXS2**	**Instrument:**	**1210**
Data File:	**S0401494001_PU.1A.gcnf**	**Aliquot:**	**0.4 L**	**Count Time:**	**240 min**
Prep Batch:	**1582738**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	0.0777	pCi/L	+/-0.0916	0.0922	0.0991	1.00
OER-100-70	Plutonium-239/240		10.3	pCi/L	+/-0.907	1.69	0.173	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	4.45	4.93	pCi/L	90.2	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582739**	**Method:**	**UISO_IE_PRECIP_AEA**	**SOP Ref:**	**GL-RAD-A-011**
Run Date:	**07/20/2016 09:51**	**Analyst:**	**MXS2**	**Instrument:**	**1009**
Data File:	**S0401494001_UU.1A.gcnf**	**Aliquot:**	**0.1 L**	**Count Time:**	**239.9998 min**
Prep Batch:	**1582739**	**Prep Method:**	**DOE EML HASL-300, U-02-R**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 *13968-55-3/13966-29-5*	Uranium-233/234		7.78	pCi/L	+/-1.32	1.65	0.377	1.00
15117-96-1/13982-7	Uranium-235/236		0.515	pCi/L	+/-0.421	0.426	0.432	1.00
7440-61-1	Uranium-238		8.84	pCi/L	+/-1.40	1.80	0.317	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	19.8	20.8	pCi/L	95.1	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582740**	**Method:**	**PU241_IE_LSC**	**SOP Ref:**	**GL-RAD-A-035**
Run Date:	**07/22/2016 13:01**	**Analyst:**	**MXS2**	**Instrument:**	**LSCGREEN**
Data File:	**PU1582740.xls**	**Aliquot:**	**0.4 L**	**Count Time:**	**45 min**
Prep Batch:	**1582740**	**Prep Method:**	**DOE EML HASL-300, Pu-11-**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14119-32-5	Plutonium-241	U	4.86	pCi/L	+/-5.98	6.07	10.1	25.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	4.45	4.93	pCi/L	90.2	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582447**	**Method:**	**9310_ALPHABETA_GPC**	**SOP Ref:**	**GL-RAD-A-001**
Run Date:	**07/28/2016 06:26**	**Analyst:**	**JXC9**	**Instrument:**	**LB4100J2**
Data File:	**AB1582447r.xls**	**Aliquot:**	**150 mL**	**Count Time:**	**180 min**
Prep Batch:	**1582447**	**Prep Method:**	**EPA 900.0/SW846 9310**		
Prep Date:	**07/26/2016 16:51**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*		30.1	pCi/L	+/-4.31	6.86	2.72	3.00
12587-47-2	Beta *BETA*		2490	pCi/L	+/-20.1	404	2.03	4.00

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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582477**	**Method:**	**SRISO_SEP_PRECIP_GPC**	**SOP Ref:**	**GL-RAD-A-004**
Run Date:	**08/03/2016 12:34**	**Analyst:**	**KSD1**	**Instrument:**	**PIC1B**
Data File:	**S1582477r.xls**	**Aliquot:**	**300 mL**	**Count Time:**	**60 min**
Prep Batch:	**1582477**	**Prep Method:**	**EPA 905.0 Modified/DOE RP5**		
Prep Date:	**07/28/2016 11:01**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		611	pCi/L	+/-9.00	95.9	1.23	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.50	7.37	mg	88.3	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1581778**	**Method:**	**DOE EML HASL-300,I-01 Mo**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**08/05/2016 17:19**	**Analyst:**	**MJH1**	**Instrument:**	**XRAY3**
Data File:	**I401494001.CNF;2**	**Aliquot:**	**1.5 L**	**Count Time:**	**240 min**
Prep Batch:	**1581778**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**08/04/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.395	pCi/L	+/-0.454	0.456	0.635	1.00

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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1581790**	**Method:**	**901.1_GAMMA_GS**	**SOP Ref:**	**GL-RAD-A-013**
Run Date:	**07/27/2016 09:46**	**Analyst:**	**MXR1**	**Instrument:**	**GAM24**
Data File:	**G401494001.CNF;1**	**Aliquot:**	**2 L**	**Count Time:**	**120 min**
Prep Batch:	**1581790**	**Prep Method:**	**EPA 901.1**		
Prep Date:	**07/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14234-35-6	Antimony-125	U	0.0855	pCi/L	+/-13.9	13.9	24.0	
13967-70-9	Cesium-134	U	0.657	pCi/L	+/-3.05	3.06	5.80	
10045-97-3	Cesium-137		854	pCi/L	+/-25.1	44.4	6.37	15.0
10198-40-0	Cobalt-60	U	-0.333	pCi/L	+/-2.28	2.29	4.10	
14683-23-9	Europium-152	U	4.60	pCi/L	+/-13.1	13.2	23.2	
15585-10-1	Europium-154	U	4.36	pCi/L	+/-6.66	6.95	14.5	
14391-16-3	Europium-155	U	4.06	pCi/L	+/-13.5	13.7	23.3	
13966-00-2	Potassium-40	U	-2.44	pCi/L	+/-30.6	30.6	65.2	

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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582184**	**Method:**	**SE79_SEP_IE_LSC**	**SOP Ref:**	**GL-RAD-A-031**
Run Date:	**07/26/2016 11:38**	**Analyst:**	**CXS7**	**Instrument:**	**LSCBLUE**
Data File:	**SE1582184R.xls**	**Aliquot:**	**0.1 L**	**Count Time:**	**90 min**
Prep Batch:	**1582184**	**Prep Method:**	**NERC ORD**		
Prep Date:	**07/20/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	U	-8.83	pCi/L	+/-12.2	12.2	21.1	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	12.2	20.0	mg	61	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582186**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**07/27/2016 11:31**	**Analyst:**	**GXR1**	**Instrument:**	**LSCBROWN**
Data File:	**E1582186R.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**30 min**
Prep Batch:	**1582186**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**07/22/2016 13:25**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		245	pCi/L	+/-26.9	38.2	35.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	25500	28900	CPM	88.2	(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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582195**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**07/25/2016 13:07**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCRED**
Data File:	**T1582195.xls**	**Aliquot:**	**50 mL**	**Count Time:**	**40 min**
Prep Batch:	**1582195**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**07/22/2016 12:17**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1220	pCi/L	+/-246	341	328	400

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:	**GEL401494**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16006**
Lab Sample ID:	**401494001**	**Date Collected:**	**07/12/2016 08:32**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35CJ2**			**Prep Basis:**	**"As Received"**
Batch ID:	**1583613**	**Method:**	**C14_LSC**	**SOP Ref:**	**GL-RAD-A-003**
Run Date:	**08/02/2016 00:05**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCGOLD**
Data File:	**C1583613.xls**	**Aliquot:**	**60 mL**	**Count Time:**	**30 min**
Prep Batch:	**1583613**	**Prep Method:**	**EPA EERF C-01 Modified**		
Prep Date:	**08/01/2016 09:39**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-0.431	pCi/L	+/-20.0	20.0	34.6	50.0

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.

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: August 8, 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: **401494**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1582736									
QC1203587305 MB									
Americium-241			U	-0.0109	pCi/L			MXS2	07/20/1610:06
Uncert:				+/-0.0484					
TPU:				+/-0.0485					
**Americium-243 Tracer	5.34			3.61	pCi/L	REC: 68	(30%-105%)		
Uncert:				+/-0.681					
TPU:				+/-1.03					
QC1203587306 401494001 DUP									
Americium-241	U	0.030	U	0.0784	pCi/L				
Uncert:		+/-0.0597		+/-0.0971		RPD: 0	N/A		
TPU:		+/-0.0599		+/-0.0977		RER: 0.827	(0-2)		
**Americium-243 Tracer	5.34	5.28		4.54	pCi/L	REC: 85	(30%-105%)		
Uncert:		+/-0.548		+/-0.608					
TPU:		+/-0.851		+/-0.929					
QC1203587307 LCS									
Americium-241	4.92			4.78	pCi/L	REC: 97	(80%-120%)		07/20/1610:09
Uncert:				+/-0.606					
TPU:				+/-0.889					
**Americium-243 Tracer	5.34			5.13	pCi/L	REC: 96	(30%-105%)		
Uncert:				+/-0.635					
TPU:				+/-0.965					
Batch 1582737									
QC1203587308 MB									
Neptunium-237			U	-0.0127	pCi/L			MXS2	07/20/1609:55
Uncert:				+/-0.190					
TPU:				+/-0.190					
**Americium-243 Tracer	2010			1830	pCi/L	REC: 91	(30%-105%)		
QC1203587309 401494001 DUP									
Neptunium-237	U	-0.0402	U	-0.0336	pCi/L				07/26/1616:06
Uncert:		+/-0.178		+/-0.232		RPD: 0	N/A		
TPU:		+/-0.178		+/-0.232		RER: 0.0442	(0-2)		
**Americium-243 Tracer	2010	1740		1880	pCi/L	REC: 94	(30%-105%)		
QC1203587310 LCS									
Neptunium-237	44.7			49.4	pCi/L	REC: 111	(80%-120%)		07/20/1609:55
Uncert:				+/-3.79					
TPU:				+/-6.58					
**Americium-243 Tracer	2010			1580	pCi/L	REC: 79	(30%-105%)		
Batch 1582738									
QC1203587311 MB									
Plutonium-238			U	0.00	pCi/L			MXS2	07/20/1610:09
Uncert:				+/-0.0506					
TPU:				+/-0.0507					
Plutonium-239/240			U	-0.0532	pCi/L				
Uncert:				+/-0.0824					

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1582738									
	TPU:			+/-0.0825					
**Plutonium-242 Tracer	4.93			4.04	pCi/L	REC: 82	(30%-105%)		
	Uncert:			+/-0.698					
	TPU:			+/-1.02					
QC1203587312 401494001 DUP									
Plutonium-238	U	0.0777	U	0.0272	pCi/L				07/20/1610:46
	Uncert:	+/-0.0916		+/-0.0766		RPD: 0	N/A		
	TPU:	+/-0.0922		+/-0.0767		RER: 0.824	(0-2)		
Plutonium-239/240		10.3		11.0	pCi/L				
	Uncert:	+/-0.907		+/-1.08		RPD: 7	(0% - 20%)		
	TPU:	+/-1.69		+/-2.05		RER: 0.557	(0-2)		
**Plutonium-242 Tracer	4.93	4.45		3.35	pCi/L	REC: 68	(30%-105%)		
	Uncert:	+/-0.628		+/-0.727					
	TPU:	+/-0.930		+/-1.06					
QC1203587313 LCS									
Plutonium-238			U	0.0792	pCi/L				07/20/1610:09
	Uncert:			+/-0.108					
	TPU:			+/-0.109					
Plutonium-239/240	4.94			4.70	pCi/L	REC: 95	(80%-120%)		
	Uncert:			+/-0.665					
	TPU:			+/-0.965					
**Plutonium-242 Tracer	4.93			3.67	pCi/L	REC: 75	(30%-105%)		
	Uncert:			+/-0.681					
	TPU:			+/-1.00					
Batch 1582739									
QC1203587314 MB									
Uranium-233/234			U	0.150	pCi/L			MXS2	07/21/1610:37
	Uncert:			+/-0.498					
	TPU:			+/-0.498					
Uranium-235/236			U	0.252	pCi/L				
	Uncert:			+/-0.445					
	TPU:			+/-0.447					
Uranium-238			U	0.322	pCi/L				
	Uncert:			+/-0.484					
	TPU:			+/-0.486					
**Uranium-232 Tracer	20.8			16.9	pCi/L	REC: 81	(30%-105%)		
	Uncert:			+/-2.68					
	TPU:			+/-4.09					
QC1203587315 401494001 DUP									
Uranium-233/234		7.78		8.18	pCi/L				07/20/1609:51
	Uncert:	+/-1.32		+/-1.43		RPD: 5	(0% - 20%)		
	TPU:	+/-1.65		+/-1.79		RER: 0.322	(0-2)		
Uranium-235/236		0.515		0.802	pCi/L				
	Uncert:	+/-0.421		+/-0.535		RPD: 44	(0% - 100%)		
	TPU:	+/-0.426		+/-0.545		RER: 0.814	(0-2)		
Uranium-238		8.84		7.50	pCi/L				
	Uncert:	+/-1.40		+/-1.36		RPD: 16	(0% - 20%)		
	TPU:	+/-1.80		+/-1.68		RER: 1.07	(0-2)		
**Uranium-232 Tracer	20.8	19.8		18.9	pCi/L	REC: 91	(30%-105%)		
	Uncert:	+/-2.18		+/-2.27					

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch 1582739									
TPU:		+/-3.43		+/-3.55					
QC1203587316 LCS									
Uranium-233/234				23.8	pCi/L				
Uncert:				+/-2.45					
TPU:				+/-4.00					
Uranium-235/236				1.66	pCi/L				
Uncert:				+/-0.749					
TPU:				+/-0.781					
Uranium-238	26.9			25.5	pCi/L	REC: 95	(80%-120%)		
Uncert:				+/-2.54					
TPU:				+/-4.24					
**Uranium-232 Tracer	20.8			18.0	pCi/L	REC: 86	(30%-105%)		
Uncert:				+/-2.32					
TPU:				+/-3.61					
Batch 1582740									
QC1203587317 MB									
Plutonium-241			U	5.85	pCi/L			MXS2	07/22/1615:21
Uncert:				+/-6.68					
TPU:				+/-6.81					
**Plutonium-242 Tracer	4.93			4.04	pCi/L	REC: 82	(30%-105%)		
Uncert:				+/-0.698					
TPU:				+/-1.02					
QC1203587318 401494001 DUP									
Plutonium-241	U	4.86	U	9.17	pCi/L				07/22/1616:07
Uncert:		+/-5.98		+/-8.06		RPD: 0	N/A		
TPU:		+/-6.07		+/-8.32		RER: 0.819	(0-2)		
**Plutonium-242 Tracer	4.93	4.45		3.35	pCi/L	REC: 68	(30%-105%)		
Uncert:		+/-0.628		+/-0.727					
TPU:		+/-0.930		+/-1.06					
QC1203587319 LCS									
Plutonium-241	192			194	pCi/L	REC: 101	(80%-120%)		07/22/1616:54
Uncert:				+/-12.5					
TPU:				+/-45.2					
**Plutonium-242 Tracer	4.93			3.71	pCi/L	REC: 75	(30%-105%)		
Uncert:				+/-0.687					
TPU:				+/-1.01					
Rad Gamma Spec									
Batch 1581778									
QC1203584985 MB									
Iodine-129			U	-0.117	pCi/L			MJH1	08/06/1615:24
Uncert:				+/-0.234					
TPU:				+/-0.240					
QC1203584986 401492001 DUP									
Iodine-129	U	-0.105	U	-0.0243	pCi/L				08/06/1615:24
Uncert:		+/-0.242		+/-0.234		RPD: 0	N/A		
TPU:		+/-0.247		+/-0.234		RER: 0.465	(0-2)		
QC1203584987 401492001 MS									
Iodine-129	27.7 U	-0.105		25.3	pCi/L	REC: 92	(75%-125%)		08/06/1615:25
Uncert:		+/-0.242		+/-1.97					
TPU:		+/-0.247		+/-3.21					

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1581778									
QC1203584988 LCS									
Iodine-129	27.7			29.0	pCi/L	REC: 104	(80%-120%)		08/06/1615:27
	Uncert:			+/-2.01					
	TPU:			+/-3.53					
Batch 1581790									
QC1203585022 MB									
Antimony-125			U	8.19	pCi/L			MXR1	07/27/1611:35
	Uncert:			+/-8.30					
	TPU:			+/-9.09					
Cesium-134			U	-2.91	pCi/L				
	Uncert:			+/-3.49					
	TPU:			+/-3.73					
Cesium-137			U	-0.917	pCi/L				
	Uncert:			+/-3.26					
	TPU:			+/-3.29					
Cobalt-60			U	0.427	pCi/L				
	Uncert:			+/-3.08					
	TPU:			+/-3.09					
Europium-152			U	2.33	pCi/L				
	Uncert:			+/-9.35					
	TPU:			+/-9.41					
Europium-154			U	0.500	pCi/L				
	Uncert:			+/-7.76					
	TPU:			+/-7.76					
Europium-155			U	0.730	pCi/L				
	Uncert:			+/-10.7					
	TPU:			+/-10.7					
Potassium-40			U	-29.8	pCi/L				
	Uncert:			+/-43.0					
	TPU:			+/-45.0					
QC1203585023 401494001 DUP									
Antimony-125	U	0.0855	U	-5.61	pCi/L				07/27/1612:04
	Uncert:	+/-13.9		+/-13.6		RPD: 0	N/A		
	TPU:	+/-13.9		+/-13.8		RER: 0.569	(0-2)		
Cesium-134	U	0.657	U	0.203	pCi/L				
	Uncert:	+/-3.05		+/-2.63		RPD: 0	N/A		
	TPU:	+/-3.06		+/-2.63		RER: 0.22	(0-2)		
Cesium-137		854		836	pCi/L				
	Uncert:	+/-25.1		+/-24.6		RPD: 2	(0% - 20%)		
	TPU:	+/-44.4		+/-70.6		RER: 0.411	(0-2)		
Cobalt-60	U	-0.333	U	0.514	pCi/L				
	Uncert:	+/-2.28		+/-2.28		RPD: 0	N/A		
	TPU:	+/-2.29		+/-2.30		RER: 0.513	(0-2)		
Europium-152	U	4.60	U	-8.27	pCi/L				
	Uncert:	+/-13.1		+/-12.7		RPD: 0	N/A		
	TPU:	+/-13.2		+/-13.2		RER: 1.35	(0-2)		
Europium-154	U	4.36	U	0.862	pCi/L				
	Uncert:	+/-6.66		+/-5.74		RPD: 0	N/A		
	TPU:	+/-6.95		+/-5.76		RER: 0.76	(0-2)		
Europium-155	U	4.06	U	-11.2	pCi/L				

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Gamma Spec										
Batch 1581790										
	Uncert:	+/-13.5		+/-14.3						
	TPU:	+/-13.7		+/-15.2		RPD:	0	N/A		
						RER:	1.46	(0-2)		
Potassium-40	U	-2.44	U	-2.24	pCi/L					
	Uncert:	+/-30.6		+/-29.0		RPD:	0	N/A		
	TPU:	+/-30.6		+/-29.1		RER:	0.0091	(0-2)		
QC1203585024 LCS										
Americium-241	34400			35200	pCi/L	REC:	102	(80%-120%)		07/27/1611:07
	Uncert:			+/-840						
	TPU:			+/-3020						
Antimony-125			U	-143	pCi/L					
	Uncert:			+/-194						
	TPU:			+/-205						
Cesium-134			U	-35.3	pCi/L					
	Uncert:			+/-73.5						
	TPU:			+/-75.3						
Cesium-137	13400			14000	pCi/L	REC:	104	(80%-120%)		
	Uncert:			+/-303						
	TPU:			+/-1140						
Cobalt-60	13400			13800	pCi/L	REC:	103	(80%-120%)		
	Uncert:			+/-338						
	TPU:			+/-1160						
Europium-152			U	-19.5	pCi/L					
	Uncert:			+/-190						
	TPU:			+/-190						
Europium-154			U	-24.3	pCi/L					
	Uncert:			+/-107						
	TPU:			+/-108						
Europium-155			U	-84.6	pCi/L					
	Uncert:			+/-221						
	TPU:			+/-224						
Potassium-40			U	-115	pCi/L					
	Uncert:			+/-242						
	TPU:			+/-248						
Rad Gas Flow										
Batch 1582447										
QC1203586586 MB										
Alpha			U	-0.0251	pCi/L				JXC9	07/28/1606:22
	Uncert:			+/-0.906						
	TPU:			+/-0.907						
Beta			U	-1.68	pCi/L					
	Uncert:			+/-1.97						
	TPU:			+/-1.97						
QC1203586587 400886001 DUP										
Alpha	U	-0.462	U	0.411	pCi/L					07/28/1606:36
	Uncert:	+/-1.24		+/-1.52		RPD:	0	N/A		
	TPU:	+/-1.24		+/-1.52		RER:	0.874	(0-2)		
Beta		11.5		12.0	pCi/L					
	Uncert:	+/-1.91		+/-1.76		RPD:	4	(0% - 20%)		
	TPU:	+/-2.69		+/-2.62		RER:	0.252	(0-2)		

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch 1582447									
QC1203586588 400886001 MS									
Alpha	240	U -0.462		214	pCi/L	REC: 89	(75%-125%)		07/28/1606:18
Uncert:		+/-1.24		+/-24.8					
TPU:		+/-1.24		+/-42.9					
Beta	874	11.5		1020	pCi/L	REC: 115	(75%-125%)		
Uncert:		+/-1.91		+/-38.0					
TPU:		+/-2.69		+/-170					
QC1203586589 400886001 MSD									
Alpha	240	U -0.462		234	pCi/L	REC: 98	(75%-125%)		07/28/1606:18
Uncert:		+/-1.24		+/-25.0		RPD: 9	(0%-20%)		
TPU:		+/-1.24		+/-45.7		RER: 0.625	(0-2)		
Beta	874	11.5		990	pCi/L	REC: 112	(75%-125%)		
Uncert:		+/-1.91		+/-36.4		RPD: 3	(0%-20%)		
TPU:		+/-2.69		+/-166		RER: 0.253	(0-2)		
QC1203586590 LCS									
Alpha	79.9			71.0	pCi/L	REC: 89	(80%-120%)		08/02/1611:17
Uncert:				+/-7.54					
TPU:				+/-13.9					
Beta	291			324	pCi/L	REC: 111	(80%-120%)		
Uncert:				+/-12.2					
TPU:				+/-55.1					
Batch 1582477									
QC1203586675 MB									
Strontium-90			U	-0.249	pCi/L			KSD1	07/30/1616:18
Uncert:				+/-0.431					
TPU:				+/-0.431					
**Strontium Carrier	7.37			6.60	mg	REC: 90	(40%-110%)		
QC1203586676 401516001 DUP									
Strontium-90		U -0.666	U	-0.908	pCi/L				07/30/1616:18
Uncert:		+/-0.623		+/-0.629		RPD: 0	N/A		
TPU:		+/-0.623		+/-0.629		RER: 0.535	(0-2)		
**Strontium Carrier	7.37	7.10		6.70	mg	REC: 91	(40%-110%)		
QC1203586677 LCS									
Strontium-90	72.8			68.9	pCi/L	REC: 95	(80%-120%)		07/30/1616:18
Uncert:				+/-3.55					
TPU:				+/-11.3					
**Strontium Carrier	7.37			7.00	mg	REC: 95	(40%-110%)		
Rad Liquid Scintillation									
Batch 1582184									
QC1203585985 MB									
Selenium-79			U	-11.2	pCi/L			CXS7	07/26/1614:45
Uncert:				+/-8.41					
TPU:				+/-8.41					
**Selenium Carrier	20.0			17.7	mg	REC: 89	(40%-110%)		
QC1203585986 400884001 DUP									
Selenium-79		U -5.91	U	-9.72	pCi/L				07/26/1616:18
Uncert:		+/-9.19		+/-8.37		RPD: 0	N/A		
TPU:		+/-9.19		+/-8.37		RER: 0.601	(0-2)		
**Selenium Carrier	20.0	16.4		17.9	mg	REC: 90	(40%-110%)		
QC1203585987 LCS									

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

QC Summary

Workorder: 401494

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Liquid Scintillation										
Batch 1582184										
Selenium-79	1450			1630	pCi/L	REC:	112	(80%-120%)		
Uncert:				+/-35.8						
TPU:				+/-58.7						
**Selenium Carrier	20.0			16.0	mg	REC:	80	(40%-110%)		
Batch 1582186										
QC1203585992 MB										
Technetium-99			U	1.14	pCi/L				GXR1	07/26/1613:22
Uncert:				+/-21.7						
TPU:				+/-21.7						
**Technetium-99m Tracer	28900			24100	CPM	REC:	83	(30%-105%)		
QC1203585993 400884001 DUP										
Technetium-99		41.3		55.8	pCi/L					07/27/1612:35
Uncert:		+/-22.8		+/-22.8		RPD:	30	(0% - 100%)		
TPU:		+/-23.2		+/-23.6		RER:	0.858	(0-2)		
**Technetium-99m Tracer	28900	24500		24400	CPM	REC:	84	(30%-105%)		
QC1203585994 LCS										
Technetium-99	861			837	pCi/L	REC:	97	(80%-120%)		07/26/1614:25
Uncert:				+/-38.2						
TPU:				+/-100						
**Technetium-99m Tracer	28900			25400	CPM	REC:	88	(30%-105%)		
Batch 1582195										
QC1203586023 MB										
Tritium			U	-22.9	pCi/L				TXJ1	07/25/1617:19
Uncert:				+/-180						
TPU:				+/-180						
QC1203586024 400884001 DUP										
Tritium	U	39.3	U	165	pCi/L					07/25/1618:01
Uncert:		+/-195		+/-198		RPD:	0	N/A		
TPU:		+/-195		+/-200		RER:	0.882	(0-2)		
QC1203586025 400884001 MS										
Tritium	2320 U	39.3		1900	pCi/L	REC:	82	(75%-125%)		07/25/1618:43
Uncert:		+/-195		+/-275						
TPU:		+/-195		+/-459						
QC1203586026 LCS										
Tritium	2320			1940	pCi/L	REC:	84	(80%-120%)		07/25/1619:25
Uncert:				+/-274						
TPU:				+/-464						
Batch 1583613										
QC1203589378 MB										
Carbon-14			U	15.7	pCi/L				TXJ1	08/02/1603:21
Uncert:				+/-20.6						
TPU:				+/-20.8						
QC1203589379 401206001 DUP										
Carbon-14		40100		40300	pCi/L					08/02/1603:52
Uncert:		+/-394		+/-396		RPD:	0	(0% - 20%)		
TPU:		+/-7460		+/-7490		RER:	0.0293	(0-2)		
QC1203589380 401206001 MS										
Carbon-14	1260	40100		41200	pCi/L	REC:	83	(75%-125%)		08/02/1604:04
Uncert:		+/-394		+/-404						

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

QC Summary

Workorder: **401494**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1583613									
	TPU:	+/-7460		+/-7650					
QC1203589381 LCS									
Carbon-14	1260			1240	pCi/L	REC: 99	(80%-120%)		08/02/16 04:16
	Uncert:			+/-46.0					
	TPU:			+/-235					

Notes:

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

The Qualifiers in this report are defined as follows:

*	Duplicate analysis not within control limits
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D	Results are reported from a diluted aliquot of sample.
E	Reported value is estimated due to interferences. See comment in narrative.
M	Duplicate precision not met.
N	Spike Sample recovery is outside control limits.
S	Reported value determined by the Method of Standard Additions (MSA)
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
UX	Gamma Spectroscopy--Uncertain identification
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

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