

July 21, 2015

REV 1



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April 30, 2015

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

Re: CHPRC SAF F11-031
Work Order: 371244
SDG: GEL371244

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 17, 2015. 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,

A handwritten signature in cursive script that reads "Heather Shaffer".

Heather Shaffer
Project Manager

Purchase Order: 302853JPRC - 9C
Chain of Custody: F11-031-080
Enclosures



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Case Narrative

**General Narrative
for
CH2M Hill Plateau Remediation Company
CHPRC SAF F11-031
SDG: GEL371244**

April 30, 2015

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 April 17, 2015, 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
371244001	B312K3

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: Radiochemistry.

This package, to the best of my knowledge, 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.

July 21, 2015

REV 1

Heather Shaffer

Heather Shaffer
Project Manager

Problem and Discrepancy Report

GEL

SDG GEL371244

06/10/15

The data package has the following issues:

SR-RAD (total Sr) was requested for sample B312K3, however Sr-90 with SRTOT method was reported.

Resolution: *Provide correction.*

Lab Response:

Please correct the issues and resubmit the hard copy and electronic data package.

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>371244</u>
Received By: <u>MK</u>		Date Received: <u>4-17-15</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>0</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 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: <u>Ice bags</u> Blue ice Dry ice None Other (describe) all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130532776</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: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 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:
8 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
9 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
10 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:
11 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 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>7733 8971 2618 2c</u> <u>7733 8971 2662 2c</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556-8171

Report Date: 30-APR-15

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	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	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	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).	Y	Inorganics	Metals	Replaces J Estimated Value
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely performed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	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).	Y	General Chemistry		Replaces J Estimated Value
C	Programmed	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.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	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.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

July 21, 2015

REV 1

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

Report Date: 30-APR-15

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy—Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 30 April 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
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	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL371244
Work Order #: 371244

Method/Analysis Information

Product: AMCMISO_EIE_PLATE_AEA:COMMON
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 1472490
Prep Batch Number: 1472170

Sample ID	Client ID
371244001	B312K3
1203302562	Method Blank (MB)
1203302564	Laboratory Control Sample (LCS)
1203302563	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	PUIISO_PLATE_AEA: COMMON
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1472491
Prep Batch Number:	1472170

Sample ID	Client ID
371244001	B312K3
1203302565	Method Blank (MB)
1203302567	Laboratory Control Sample (LCS)

1203302566 371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 1203302567 (LCS) was recounted due to high recovery. The recount is reported. Sample 371244001 (B312K3) was recounted twice due to high MDC. The third count is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: UIISO_PLATE_AEA: COMMON
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 1472492
Prep Batch Number: 1472170

Sample ID	Client ID
371244001	B312K3
1203302568	Method Blank (MB)
1203302570	Laboratory Control Sample (LCS)
1203302569	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	THISO_IE_PLATE_AEA: COMMON (TH232)
Analytical Method:	DOE EML HASL-300, Th-01-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1473293
Prep Batch Number:	1472170

Sample ID Client ID

371244001	B312K3
1203304706	Method Blank (MB)
1203304708	Laboratory Control Sample (LCS)
1203304707	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-038 REV# 16.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: NP237_LLE_PLATE_AEA: COMMON

Analytical Method: ASTM C 1476-00 Modified

Prep Method: Dry Soil Prep

Analytical Batch Number: 1473375

Prep Batch Number: 1472170

Sample ID	Client ID
371244001	B312K3
1203304928	Method Blank (MB)
1203304930	Laboratory Control Sample (LCS)
1203304929	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-032 REV# 19.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	GAMMA_GS: COMMON + ADD ON (Pa231)
Analytical Method:	DOE HASL 300, 4.5.2.3/Ga-01-R
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1472300
Prep Batch Number:	1472170

Sample ID	Client ID
371244001	B312K3
1203302031	Method Blank (MB)
1203302033	Laboratory Control Sample (LCS)
1203302032	371247001(B31331) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371247001 (B31331).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Data rejected due to no valid peak.	Europium-155	1203302032	B31331(371247001DUP)
		Protactinium-231	1203302032	B31331(371247001DUP)

Method/Analysis Information

Product: I129_SEP_LEPS_GS: COMMON
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Batch Number: 1472805

Sample ID	Client ID
371244001	B312K3
1203303484	Method Blank (MB)
1203303487	Laboratory Control Sample (LCS)
1203303485	371244001(B312K3) Sample Duplicate (DUP)
1203303486	371244001(B312K3) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-006 REV# 21.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	SRTOT_SEP_PRECEIP_GPC: COMMON
Analytical Method:	EPA 905.0 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1472580
Prep Batch Number:	1472170

Sample ID	Client ID
371244001	B312K3
1203302755	Method Blank (MB)
1203302757	Laboratory Control Sample (LCS)
1203302756	371247001(B31331) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371247001 (B31331).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203302756 (Non SDG 371247001DUP), have a relative error ratio greater than 2 but there is no activity being reported in either sample.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Sample 1203302755 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ALPHABETA_GPC: COMMON
Analytical Method: EPA 900.0/SW846 9310/SM 7110B Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 1472604
Prep Batch Number: 1472170

Sample ID	Client ID
371244001	B312K3
1203302859	Method Blank (MB)
1203302863	Laboratory Control Sample (LCS)
1203302860	371247001(B31331) Sample Duplicate (DUP)
1203302861	371247001(B31331) Matrix Spike (MS)
1203302862	371247001(B31331) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001B REV# 17.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371247001 (B31331).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203302860 (Non SDG 371247001DUP), did not meet the alpha relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 1.73.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

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 1203302860 (Non SDG 371247001DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: NI63_LSC: COMMON
Analytical Method: DOE RESL Ni-1, Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 1472403
Prep Batch Number: 1472170

Sample ID	Client ID
371244001	B312K3
1203302283	Method Blank (MB)
1203302285	Laboratory Control Sample (LCS)
1203302284	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 17.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	SE79_SEP_IE_LSC: COMMON
Analytical Method:	NERC ORD
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1472405
Prep Batch Number:	1472170

Sample ID	Client ID
371244001	B312K3
1203302286	Method Blank (MB)
1203302288	Laboratory Control Sample (LCS)
1203302287	371244001(B312K3) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-031 REV# 11.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

The standard used expired before analysis. The standard for this analysis is used as a reference only; therefore, expiration date does not impact data. 1203302288 (LCS).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TC99_SEP_GPC: COMMON
Analytical Method: DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number: 1472416

Sample ID	Client ID
371244001	B312K3
1203302322	Method Blank (MB)
1203302324	Laboratory Control Sample (LCS)
1203302323	371247001(B31331) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-059 REV# 3.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371247001 (B31331).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 1472422

Sample ID	Client ID
371244001	B312K3
1203302346	Method Blank (MB)
1203302349	Laboratory Control Sample (LCS)
1203302347	371244001(B312K3) Sample Duplicate (DUP)
1203302348	371244001(B312K3) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

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

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: C14_LSC: COMMON
Analytical Method: EPA EERF C-01 Modified
Analytical Batch Number: 1472436

Sample ID	Client ID
371244001	B312K3
1203302390	Method Blank (MB)
1203302393	Laboratory Control Sample (LCS)
1203302391	371244001(B312K3) Sample Duplicate (DUP)
1203302392	371244001(B312K3) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371244001 (B312K3).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

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: GEL371244 GEL Work Order: 371244

The Qualifiers in this report are defined as follows:

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Review/Validation

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

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

Signature: 

Name: Kate Gellatly

Date: 01 MAY 2015

Title: Analyst I

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3		Prep Basis: As Received
Batch ID: 1472490	Method: DOE EML HASL-300, Am-05-	SOP Ref: GL-RAD-A-011
Run Date: 04/22/2015 09:20	Analyst: MXS2	Instrument: 1065
Data File: S0371244001_AM.1B.genf	Aliquot: 0.11 g	Count Time: 239.9998 min
Prep Batch: 1472490	Prep Method: DOE EML HASL-300, Am-05	Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.115	pCi/g	+/-0.263	0.264	0.418	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	15.8	19.4	pCi/g	81.4	(15%-125%)

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).

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE EML HASL-300, Pu-11-	Prep Basis: As Received
Batch ID: 1472491	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 04/23/2015 15:07	Aliquot: 0.1 g	Instrument: 1109
Data File: S0371244001_PU.2B.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 999.9998 min
Prep Batch: 1472491		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13981-16-3	Plutonium-238	U	0.125	pCi/g	+/-0.347	0.347	0.599	1.00
OER-100-70	Plutonium-239/240	U	0.125	pCi/g	+/-0.347	0.347	0.599	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	3.84	19.7	pCi/g	19.5	(15%-125%)

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).

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE EML HASL-300, U-02-R	Prep Basis: As Received
Batch ID: 1472492	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 04/22/2015 09:20	Aliquot: 0.1 g	Instrument: 1008
Data File: S0371244001_UU.1B.genf	Prep Method: DOE EML HASL-300, U-02-R	Count Time: 239.9998 min
Prep Batch: 1472492		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/20/2015 00:00		

CAS No.	Parname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 13968-55-3/139	Uranium-233/234	U	-0.0851	pCi/g	+/-0.197	0.198	0.584	1.00
15117-96-1/13982	Uranium-235/236	U	-0.0789	pCi/g	+/-0.238	0.239	0.669	1.00
7440-61-1	Uranium-238	U	-0.0213	pCi/g	+/-0.183	0.184	0.425	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	13.7	21.3	pCi/g	64.5	(15%-125%)

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE EML HASL-300, Th-01-	Prep Basis: As Received
Batch ID: 1473293	Analyst: MXS2	SOP Ref: GL-RAD-A-038
Run Date: 04/27/2015 09:37	Aliquot: 0.053 g	Instrument: 1044
Data File: S0371244001_TH.2A.genf	Prep Method: DOE EML HASL-300, Th-01-	Count Time: 999.9998 min
Prep Batch: 1473293		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/23/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
7440-29-1	Thorium-232	U	0.113	pCi/g	+/-0.250	0.251	0.435	1.00
Surrogate/Tracer recovery			Result	Nominal	Units	Recovery%	Acceptable Limits	
Thorium-229 Tracer			28.6	37.5	pCi/g	76.1	(15%-125%)	

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: ASTM C 1476-00 Modified	Prep Basis: As Received
Batch ID: 1473375	Analyst: MXS2	SOP Ref: GL-RAD-A-032
Run Date: 04/25/2015 11:25	Aliquot: 0.124 g	Instrument: 1083
Data File: S0371244001_NP.2A.gcnf	Prep Method: ASTM C 1476-00 Modified	Count Time: 239.9998 min
Prep Batch: 1473375		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/23/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
13994-20-2	Neptunium-237	U	-0.0283	pCi/g	+/-0.166	0.167	0.396	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	1490	1580	pCi/g	94.7	(15%-125%)

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3		Prep Basis: As Received
Batch ID: 1472580	Method: EPA 905.0 Modified	SOP Ref: GL-RAD-A-004
Run Date: 04/26/2015 11:15	Analyst: KSD1	Instrument: PIC2A
Data File: S1472580r1.xls	Aliquot: 0.504 g	Count Time: 60 min
Prep Batch: 1472580	Prep Method: EPA 905.0 Modified	Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/23/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.0872	pCi/g	+/-0.326	0.326	0.665	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.70	8.10	mg	82.7	(25%-125%)

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3		Prep Basis: As Received
Batch ID: 1472604	Method: EPA 900.0/SW846 9310/SM 711	SOP Ref: GL-RAD-A-001B
Run Date: 04/23/2015 19:13	Analyst: KXB2	Instrument: PIC1A
Data File: AB1472604r.xls	Aliquot: 0.098 g	Count Time: 500 min
Prep Batch: 1472604	Prep Method: EPA 900.0/SW846 9310/SM 71	Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/21/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha <i>ALPHA</i>	U	-1.17	pCi/g	+/-1.02	1.02	2.01	4.00
12587-47-2	Beta <i>BETA</i>		8.86	pCi/g	+/-1.31	1.72	1.74	10.0

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

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE HASL 300, 4.5.2.3/Ga-01	Prep Basis: As Received
Batch ID: 1472300	Analyst: MXR1	SOP Ref: GL-RAD-A-013
Run Date: 04/20/2015 09:57	Aliquot: 56.917 g	Instrument: GAM05
Data File: G371244001.CNF;2	Prep Method: DOE HASL 300, 4.5.2.3/Ga-01	Count Time: 480 min
Prep Batch: 1472300		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	0.00666	pCi/g	+/-0.024	0.0242	0.0409	0.100
10198-40-0	Cobalt-60	U	-0.0149	pCi/g	+/-0.0235	0.0244	0.0382	0.050
14683-23-9	Europium-152	U	0.0134	pCi/g	+/-0.0585	0.0589	0.0955	0.100
15585-10-1	Europium-154	U	0.0781	pCi/g	+/-0.0693	0.078	0.120	
14391-16-3	Europium-155	U	0.0462	pCi/g	+/-0.044	0.049	0.0753	
14331-85-2	Protactinium-231	U	0.0915	pCi/g	+/-0.300	0.303	0.455	1.00

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

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3		Prep Basis: As Received
Batch ID: 1472805	Method: DOE EML HASL-300,I-01 Mo	SOP Ref: GL-RAD-A-006
Run Date: 04/21/2015 10:20	Analyst: BSW1	Instrument: XRAY1
Data File: I371244001.CNF;1	Aliquot: 1.027 g	Count Time: 60 min
Prep Batch: 1472805	Prep Method: DOE EML HASL-300,I-01 M	
Prep Date: 04/21/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.176	pCi/g	+/-0.544	0.550	1.06	2.00

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

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

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE RESL Ni-1, Modified	Prep Basis: As Received
Batch ID: 1472403	Analyst: TYJ1	SOP Ref: GL-RAD-A-022
Run Date: 04/23/2015 06:42	Aliquot: 0.508 g	Instrument: LSCSILVER
Data File: N1472403.xls	Prep Method: DOE RESL Ni-1, Modified	Count Time: 40 min
Prep Batch: 1472403		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
NI-63	Nickel-63	U	4.60	pCi/g	+/-4.55	4.63	7.61	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Nickel Carrier	14.2	25.1	mg	56.6	(25%-125%)

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).

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: NERC ORD	Prep Basis: As Received
Batch ID: 1472405	Analyst: EXK2	SOP Ref: GL-RAD-A-031
Run Date: 04/29/2015 14:22	Aliquot: 0.3855 g	Instrument: LSCGOLD
Data File: SE1472405.xls	Prep Method: NERC ORD	Count Time: 120 min
Prep Batch: 1472405		Prep SOP Ref: GL-RAD-A-021
Prep Date: 04/29/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	U	0.102	pCi/g	+/-1.95	1.95	3.32	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	17.9	20.0	mg	89.5	(25%-125%)

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: DOE EML HASL-300, Tc-02-	Prep Basis: As Received
Batch ID: 1472416	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 04/28/2015 07:32	Aliquot: 0.348 g	Instrument: LSCGOLD
Data File: E1472416.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1472416		
Prep Date: 04/23/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-2.38	pCi/g	+/-6.35	6.35	11.1	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	37200	48600	CPM	76.6	(15%-125%)

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).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: EPA 906.0 Modified	Prep Basis: As Received
Batch ID: 1472422	Analyst: BYS1	SOP Ref: GL-RAD-A-002
Run Date: 04/21/2015 14:30	Aliquot: 1.33 g	Instrument: LSCGOLD
Data File: T1472422R.xls	Prep Method: EPA 906.0 Modified	Count Time: 20 min
Prep Batch: 1472422		
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-13.8	pCi/g	+/-12.4	12.4	24.4	30.0

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

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL371244	Client: CPRC001	Project: CPRC0F11031
Lab Sample ID: 371244001	Date Collected: 04/16/2015 08:30	Matrix: OTHER SOLID
	Date Received: 04/17/2015 08:55	%Moisture: 10
Client ID: B312K3	Method: EPA EERF C-01 Modified	Prep Basis: As Received
Batch ID: 1472436	Analyst: EXK2	SOP Ref: GL-RAD-A-003
Run Date: 04/23/2015 14:16	Aliquot: 0.5004 g	Instrument: LSCGREEN
Data File: C1472436.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 40 min
Prep Batch: 1472436		
Prep Date: 04/23/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	1.14	pCi/g	+/-2.35	2.35	3.99	5.00

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

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

Quality Control Data

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QC Summary

Report Date: May 1, 2015
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Client : CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 371244

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1472490								
QC1203302562	MB								
Americium-241			U	-0.0888	pCi/g			MXS2	04/22/1509:20
				Uncert: +/-0.241					
				TPU: +/-0.241					
**Americium-243 Tracer	19.4			14.3	pCi/g	REC: 74	(15%-125%)		
				Uncert: +/-2.39					
				TPU: +/-3.56					
QC1203302563	371244001	DUP							
Americium-241		U	0.115	U	0.256	pCi/g			
				Uncert: +/-0.263	+/-0.415	RPD: 0	N/A		
				TPU: +/-0.264	+/-0.416	RER: 0.563	(0-2)		
**Americium-243 Tracer	21.2			15.8	pCi/g	REC: 65	(15%-125%)		
				Uncert: +/-2.37	+/-2.72				
				TPU: +/-3.53	+/-4.04				
QC1203302564	LCS								
Americium-241	12.8			13.3	pCi/g	REC: 104	(80%-120%)		
				Uncert: +/-2.01					
				TPU: +/-2.70					
**Americium-243 Tracer	19.4			15.5	pCi/g	REC: 80	(15%-125%)		
				Uncert: +/-2.41					
				TPU: +/-3.58					
Batch	1472491								
QC1203302565	MB								
Plutonium-238			U	-0.0329	pCi/g			MXS2	04/22/1509:20
				Uncert: +/-0.227					
				TPU: +/-0.227					
Plutonium-239/240			U	0.0209	pCi/g				
				Uncert: +/-0.219					
				TPU: +/-0.219					
**Plutonium-242 Tracer	19.7			15.3	pCi/g	REC: 78	(15%-125%)		
				Uncert: +/-2.39					
				TPU: +/-3.56					
QC1203302566	371244001	DUP							
Plutonium-238		U	0.125	U	0.402	pCi/g			
				Uncert: +/-0.347	+/-0.638	RPD: 0	N/A		
				TPU: +/-0.347	+/-0.643	RER: 0.742	(0-2)		
Plutonium-239/240		U	0.125	U	0.363	pCi/g			
				Uncert: +/-0.347	+/-0.642	RPD: 0	N/A		
				TPU: +/-0.347	+/-0.646	RER: 0.637	(0-2)		
**Plutonium-242 Tracer	19.7			3.84	pCi/g	REC: 35	(15%-125%)		
				Uncert: +/-2.21	+/-3.53				
				TPU: +/-3.32	+/-5.11				
QC1203302567	LCS								
Plutonium-238			U	0.244	pCi/g				04/23/1509:59
				Uncert: +/-0.387					

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QC Summary

Workorder: 371244

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Alpha Spec										
Batch	1472491									
Plutonium-239/240	19.7	TPU:		+/-0.389						
		Uncert:		22.4	pCi/g	REC:	114	(80%-120%)		
		TPU:		+/-2.90						
**Plutonium-242 Tracer	19.7	TPU:		+/-4.44						
		Uncert:		12.1	pCi/g	REC:	61	(15%-125%)		
		TPU:		+/-2.73						
		TPU:		+/-4.02						
Batch	1472492									
QC1203302568	MB									
Uranium-233/234			U	0.113	pCi/g			MXS2	04/22/1509:20	
		Uncert:		+/-0.298						
		TPU:		+/-0.298						
Uranium-235/236			U	-0.0429	pCi/g					
		Uncert:		+/-0.190						
		TPU:		+/-0.190						
Uranium-238			U	0.055	pCi/g					
		Uncert:		+/-0.206						
		TPU:		+/-0.207						
**Uranium-232 Tracer	21.3			16.2	pCi/g	REC:	76	(15%-125%)		
		Uncert:		+/-2.46						
		TPU:		+/-4.21						
QC1203302569	371244001	DUP								
Uranium-233/234		U	-0.0851	U	0.336	pCi/g				
		Uncert:	+/-0.197		+/-0.499		RPD:	0	N/A	
		TPU:	+/-0.198		+/-0.503		RER:	1.53	(0-2)	
Uranium-235/236		U	-0.0789	U	-0.0657	pCi/g				
		Uncert:	+/-0.238		+/-0.290		RPD:	0	N/A	
		TPU:	+/-0.239		+/-0.291		RER:	0.0687	(0-2)	
Uranium-238		U	-0.0213	U	-0.106	pCi/g				
		Uncert:	+/-0.183		+/-0.246		RPD:	0	N/A	
		TPU:	+/-0.184		+/-0.247		RER:	0.541	(0-2)	
**Uranium-232 Tracer	21.3		13.7		11.8	pCi/g	REC:	56	(15%-125%)	
		Uncert:	+/-2.75		+/-3.09					
		TPU:	+/-4.56		+/-4.97					
QC1203302570	LCS									
Uranium-233/234				28.1	pCi/g					
		Uncert:		+/-2.71						
		TPU:		+/-5.20						
Uranium-235/236				1.37	pCi/g					
		Uncert:		+/-0.694						
		TPU:		+/-0.727						
Uranium-238	27.2			28.2	pCi/g	REC:	104	(80%-120%)		
		Uncert:		+/-2.71						
		TPU:		+/-5.22						
**Uranium-232 Tracer	21.3			18.9	pCi/g	REC:	89	(15%-125%)		
		Uncert:		+/-2.37						
		TPU:		+/-4.11						
Batch	1473293									
QC1203304706	MB									

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QC Summary

Workorder: 371244

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Alpha Spec										
Batch	1473293									
Thorium-232			U	-0.0415	pCi/g			MXS2	04/27/1509:37	
				Uncert: +/-0.120						
				TPU: +/-0.120						
**Thorium-229 Tracer	36.2			30.7	pCi/g	REC: 85	(15%-125%)			
				Uncert: +/-1.96						
				TPU: +/-4.39						
QC1203304707	371244001	DUP								
Thorium-232		U	0.113	U	0.0685					
				Uncert: +/-0.250		RPD: 0	N/A			
				TPU: +/-0.251		RER: 0.302	(0-2)			
**Thorium-229 Tracer	36.2		28.6	29.8	pCi/g	REC: 82	(15%-125%)			
				Uncert: +/-2.16						
				TPU: +/-4.68						
QC1203304708	LCS									
Thorium-232				38.4	pCi/g	REC: 106	(80%-120%)			
				Uncert: +/-1.94						
				TPU: +/-4.57						
**Thorium-229 Tracer	36.2			35.1	pCi/g	REC: 97	(15%-125%)			
				Uncert: +/-1.90						
				TPU: +/-4.33						
Batch	1473375									
QC1203304928	MB									
Neptunium-237			U	-0.0237	pCi/g			MXS2	04/25/1511:25	
				Uncert: +/-0.164						
				TPU: +/-0.164						
**Americium-243 Tracer	1580			1280	pCi/g	REC: 82	(15%-125%)			
QC1203304929	371244001	DUP								
Neptunium-237		U	-0.0283	U	-0.0511					
				Uncert: +/-0.166		RPD: 0	N/A			
				TPU: +/-0.167		RER: 0.218	(0-2)			
**Americium-243 Tracer	1840		1490	1850	pCi/g	REC: 100	(15%-125%)			
QC1203304930	LCS									
Neptunium-237				38.8	pCi/g	REC: 112	(80%-120%)			
				Uncert: +/-2.94						
				TPU: +/-5.13						
**Americium-243 Tracer	1580			1350	pCi/g	REC: 85	(15%-125%)			
Rad Gamma Spec										
Batch	1472300									
QC1203302031	MB									
Cesium-137			U	-0.000357	pCi/g			MXR1	04/20/1510:28	
				Uncert: +/-0.0157						
				TPU: +/-0.0157						
Cobalt-60			U	-0.00727	pCi/g					
				Uncert: +/-0.0159						
				TPU: +/-0.0162						
Europium-152			U	0.0436	pCi/g					
				Uncert: +/-0.0416						
				TPU: +/-0.0462						
Europium-154			U	0.0291	pCi/g					

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gamma Spec										
Batch	1472300									
Europium-155				Uncert: +/-0.0405 TPU: +/-0.0426						
			U	0.0023	pCi/g					
Protactinium-231				Uncert: +/-0.0322 TPU: +/-0.0322						
			U	0.106	pCi/g					
				Uncert: +/-0.183 TPU: +/-0.190						
QC1203302032	371247001	DUP								
Cesium-137		U	0.00495	U	-0.00144	pCi/g				04/20/1510:28
				Uncert: +/-0.0165 TPU: +/-0.0167		RPD: 0 RER: 0.518	N/A (0-2)			
Cobalt-60		U	0.0238	U	0.00565	pCi/g				
				Uncert: +/-0.0178 TPU: +/-0.0208		RPD: 0 RER: 1.27	N/A (0-2)			
Europium-152		U	-0.0251	U	-0.045	pCi/g				
				Uncert: +/-0.0487 TPU: +/-0.0501		RPD: 0 RER: 0.567	N/A (0-2)			
Europium-154		U	-0.0709	U	-0.0224	pCi/g				
				Uncert: +/-0.0662 TPU: +/-0.0737		RPD: 0 RER: 1.01	N/A (0-2)			
Europium-155		X	0.123	X	0.0944	pCi/g				
				Uncert: +/-0.0563 TPU: +/-0.0577		RPD: 0 RER: 0.688	(0% - 100%) (0-2)			
Protactinium-231			0.754	X	0.851	pCi/g				
				Uncert: +/-0.278 TPU: +/-0.324		RPD: 12 RER: 0.394	(0% - 100%) (0-2)			
QC1203302033	LCS									
Americium-241		490			566	pCi/g	REC: 115	(80%-120%)		04/20/1510:21
				Uncert: +/-11.4 TPU: +/-40.3						
Cesium-137		185			182	pCi/g	REC: 98	(80%-120%)		
				Uncert: +/-3.31 TPU: +/-14.8						
Cobalt-60		194			185	pCi/g	REC: 95	(80%-120%)		
				Uncert: +/-3.79 TPU: +/-14.8						
Europium-152					1.17	pCi/g				
				Uncert: +/-1.78 TPU: +/-1.86						
Europium-154					1.11	pCi/g				
				Uncert: +/-1.42 TPU: +/-1.51						
Europium-155					-0.531	pCi/g				
				Uncert: +/-1.49 TPU: +/-1.51						
Protactinium-231					0.930	pCi/g				
				Uncert: +/-7.93 TPU: +/-7.95						
Batch	1472805									

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gamma Spec										
Batch	1472805									
QC1203303484	MB									
Iodine-129			U	0.596	pCi/g			BSW1	04/21/1510:21	
				Uncert: +/-1.11						
				TPU: +/-1.11						
QC1203303485	371244001	DUP								
Iodine-129			U	-0.176	U	-0.127			04/21/1510:21	
				Uncert: +/-0.544		+/-0.251	RPD: 0	N/A		
				TPU: +/-0.550		+/-0.258	RER: 0.157	(0-2)		
QC1203303486	371244001	MS								
Iodine-129			U	-0.176		36.6			04/21/1510:22	
				Uncert: +/-0.544		+/-4.72	REC: 92	(75%-125%)		
				TPU: +/-0.550		+/-5.97				
QC1203303487	LCS									
Iodine-129				39.4		38.8			04/21/1510:22	
				Uncert: +/-5.39			REC: 98	(80%-120%)		
				TPU: +/-6.64						
Rad Gas Flow										
Batch	1472580									
QC1203302755	MB									
Strontium-90			U	-0.0342	pCi/g			KSD1	04/27/1517:50	
				Uncert: +/-0.223						
				TPU: +/-0.223						
**Strontium Carrier				8.10	mg	7.70	REC: 95	(25%-125%)		
QC1203302756	371247001	DUP								
Strontium-90			U	-0.398	U	0.274			04/26/1511:15	
				Uncert: +/-0.391		+/-0.459	RPD: 0	N/A		
				TPU: +/-0.391		+/-0.462	RER: 2.18	(0-2)		
**Strontium Carrier				8.10	mg	6.90	REC: 85	(25%-125%)		
QC1203302757	LCS									
Strontium-90				41.2		40.8			04/26/1511:04	
				Uncert: +/-2.04			REC: 99	(80%-120%)		
				TPU: +/-7.78						
**Strontium Carrier				8.10	mg	6.90	REC: 85	(25%-125%)		
Batch	1472604									
QC1203302859	MB									
Alpha			U	-0.903	pCi/g			KXB2	04/23/1519:13	
				Uncert: +/-0.764						
				TPU: +/-0.764						
Beta			U	0.350	pCi/g					
				Uncert: +/-0.880						
				TPU: +/-0.882						
QC1203302860	371247001	DUP								
Alpha				12.2		17.8			04/30/1515:06	
				Uncert: +/-2.40		+/-4.10	RPD: 37*	(0% - 20%)		
				TPU: +/-3.37		+/-5.38	RER: 1.73	(0-2)		
Beta				27.0		25.0				
				Uncert: +/-1.93		+/-2.96	RPD: 8	(0% - 20%)		
				TPU: +/-4.23		+/-4.60	RER: 0.635	(0-2)		
QC1203302861	371247001	MS								
Alpha				118	12.2	114			04/23/1513:21	
							REC: 86	(75%-125%)		

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QC Summary

Workorder: 371244

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gas Flow										
Batch	1472604									
				Uncert:						
				TPU:						
Beta	459	27.0		491	pCi/g	REC: 101	(75%-125%)			
				Uncert:						
				TPU:						
QC1203302862	371247001	MSD								
Alpha	115	12.2		128	pCi/g	REC: 101	(75%-125%)		04/23/1513:21	
				Uncert:						
				TPU:						
Beta	446	27.0		502	pCi/g	REC: 107	(75%-125%)			
				Uncert:						
				TPU:						
QC1203302863	LCS									
Alpha	115			99.6	pCi/g	REC: 87	(80%-120%)		04/23/1513:21	
				Uncert:						
				TPU:						
Beta	446			482	pCi/g	REC: 108	(80%-120%)			
				Uncert:						
				TPU:						
Rad Liquid Scintillation										
Batch	1472403									
QC1203302283	MB									
Nickel-63			U	2.13	pCi/g			TYJ1	04/23/1507:24	
				Uncert:						
				TPU:						
**Nickel Carrier	25.1			15.1	mg	REC: 60	(25%-125%)			
QC1203302284	371244001	DUP								
Nickel-63		U	4.60	U	1.31	pCi/g			04/23/1508:06	
				Uncert:						
				TPU:						
**Nickel Carrier	25.1			16.6	mg	REC: 66	(25%-125%)			
QC1203302285	LCS									
Nickel-63	252			274	pCi/g	REC: 109	(80%-120%)		04/23/1508:48	
				Uncert:						
				TPU:						
**Nickel Carrier	25.1			16.1	mg	REC: 64	(25%-125%)			
Batch	1472405									
QC1203302286	MB									
Selenium-79			U	-1.24	pCi/g			EXK2	04/29/1516:26	
				Uncert:						
				TPU:						
**Selenium Carrier	20.0			14.9	mg	REC: 75	(25%-125%)			
QC1203302287	371244001	DUP								
Selenium-79		U	0.102	U	-0.0268	pCi/g			04/29/1518:30	
				Uncert:						
				TPU:						
**Selenium Carrier	20.0			18.2	mg	REC: 91	(25%-125%)			
QC1203302288	LCS									
Selenium-79	208			197	pCi/g	REC: 95	(80%-120%)		04/29/1520:33	
				Uncert:						
				TPU:						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1472405									
		TPU:		+/-44.3						
**Selenium Carrier	20.0			16.8	mg	REC:	84 (25%-125%)			
Batch	1472416									
QC1203302322	MB									
Technetium-99			U	0.237	pCi/g			MYM1	04/28/1508:36	
		Uncert:		+/-4.87						
		TPU:		+/-4.87						
**Technetium-99m Tracer	48600			45600	CPM	REC:	94 (15%-125%)			
QC1203302323	371247001	DUP								
Technetium-99		U	-1.62	U	1.95	pCi/g			04/28/1509:08	
		Uncert:	+/-5.32		+/-5.13		RPD: 0 N/A			
		TPU:	+/-5.32		+/-5.13		RER: 0.947 (0-2)			
**Technetium-99m Tracer	48600	46300		45600	CPM	REC:	94 (15%-125%)			
QC1203302324	LCS									
Technetium-99	247			238	pCi/g	REC:	96 (80%-120%)		04/28/1509:40	
		Uncert:		+/-9.88						
		TPU:		+/-29.4						
**Technetium-99m Tracer	48600			45500	CPM	REC:	94 (15%-125%)			
Batch	1472422									
QC1203302346	MB									
Tritium			U	-7.44	pCi/g			BYS1	04/21/1514:52	
		Uncert:		+/-13.1						
		TPU:		+/-13.1						
QC1203302347	371244001	DUP								
Tritium		U	-13.8	U	3.56	pCi/g			04/21/1515:13	
		Uncert:	+/-12.4		+/-14.7		RPD: 0 N/A			
		TPU:	+/-12.4		+/-14.8		RER: 1.76 (0-2)			
QC1203302348	371244001	MS								
Tritium	72.7	U	-13.8		75.4	pCi/g	REC:	104 (75%-125%)	04/21/1515:34	
		Uncert:	+/-12.4		+/-19.2					
		TPU:	+/-12.4		+/-25.7					
QC1203302349	LCS									
Tritium	69.4				73.7	pCi/g	REC:	106 (80%-120%)	04/21/1515:56	
		Uncert:			+/-18.8					
		TPU:			+/-25.2					
Batch	1472436									
QC1203302390	MB									
Carbon-14			U	2.62	pCi/g			EXK2	04/23/1514:57	
		Uncert:		+/-2.24						
		TPU:		+/-2.25						
QC1203302391	371244001	DUP								
Carbon-14		U	1.14	U	0.0837	pCi/g			04/23/1515:39	
		Uncert:	+/-2.35		+/-2.16		RPD: 0 N/A			
		TPU:	+/-2.35		+/-2.16		RER: 0.647 (0-2)			
QC1203302392	371244001	MS								
Carbon-14	150	U	1.14		163	pCi/g	REC:	109 (75%-125%)	04/23/1516:21	
		Uncert:	+/-2.35		+/-5.14					
		TPU:	+/-2.35		+/-13.1					
QC1203302393	LCS									
Carbon-14	141				145	pCi/g	REC:	103 (80%-120%)	04/23/1517:03	

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch		1472436								

Uncert: +/-4.73
 TPU: +/-11.7

Notes:

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

The Qualifiers in this report are defined as follows:

- B The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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.