

7/14/2016



July 12, 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: 399588
SDG: GEL399588

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 17, 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: S16-006-251 and S16-006-284
Enclosures

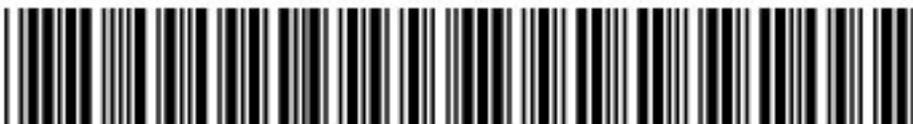


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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION

SIR NUM	SIR16-457
REV NUM	0
DATE INITIATED	7/5/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) S16-006
OPERABLE UNIT(S) NONE
PROJECT(S) SURV16
SAMPLE EVENT TITLE(S) SURV16
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B35CF2
SAMPLE MATRIX WATER
COLLECTION DATE 6/16/2016 - 6/16/2016
SDG NUM GEL399588

ISSUE BACKGROUND

CLASS Laboratory Issue

TYPE Quality Control Failure

DESCRIPTION The Se-79 batch for the listed SDGs had an LCS recovery of 121% that does not meet the client recovery range of 80-120%; however, it does meet our standard requirement of 125%. All of the sample results in the batch are less than MDA; therefore, this high bias does not impact the data.

DISPOSITION

DESCRIPTION Proposed Resolution: Initiate SIR, report results and include a detailed comment in the case narrative.

JUSTIFICATION Final Disposition: Accept proposed resolution.

SUBMITTED BY: Heather Shaffer DATE: 07/01/2016
ACCEPTED BY: Sarah Nagel DATE: 07/05/2016

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S16-006
SDG: GEL399588**

July 12, 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 June 17, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Please see the enclosed SIR regarding a QC issue for Se79 analysis.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
399588001	B35BC8
399588002	B35CF2

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.

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.

7/14/2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL399588
Work Order #: 399588

PUISO_PRECIP_AEA:COMMON

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

Technical Information**Recounts**

Sample 399588002 (B35CF2) was recounted due to poor resolution. The recount is reported.

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.

UIISO_IE_PRECIP_AEA:COMMON

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

GAMMA_GS:COMMON + GW 01

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**

The sample and the duplicate, 1203570526 (B35C93DUP), did not meet the Cs-137 relative error ratio requirement; however, both results are less than their respective MDCs.

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.

9310_ALPHABETA_GPC: Gross Beta

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

Samples 1203574715 (B35D60MSD) and 1203574716 (LCS) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203574714 (B35D60MS) and 1203574715 (B35D60MSD), 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 1203574969 (B359Y1DUP) was recounted due to results more negative than the three sigma TPU. The second count is reported. Sample 399588002 (B35CF2) was recounted due to a suspected false positive. The recount is reported.

PU241_IE_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.

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.

Quality Control (QC) Information

QC Information

The laboratory control sample 1203570474 (LCS) does not meet the client's LCS requirement of 80-120%; however, it does meet GEL's standard LCS requirement of 75-125%. Reporting results.

Technical Information

Recounts

Sample 1203570474 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

TC99_EIE_LSC: COMMON

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

TRITIUM_DIST_LSC: COMMON

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

C14_LSC: COMMON

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

Certification Statement

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

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # S16-006-251
CH2M Hill Plateau Remediation Company		Page 1 of 1
Collector <i>Juan Aguilar CA P 22</i>	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 86 / 29	Ice Chest No. <i>6057506</i>
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. <i>7765415/9897</i>
Protocol SURV	Priority: 30 Days	Offsite Property No. <i>6738</i>
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		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
SPECIAL INSTRUCTIONS N/A		Hold Time
Sample No. B35BC8	Filter N	Sample Analysis SRISO_SEP_PRECIP_GPC: COMMON
Date <i>6-15-16</i>	No/Type Container 3x1-L G/P	Holding Time 6 Months
Time <i>1319</i>	Preservative	HNO3 to pH <2

Relinquished By <i>Juan Aguilar</i>	Print <i>[Signature]</i>	Sign	Date/Time JUN 15 2016 1410	Received By SSU #1	Print <i>[Signature]</i>	Sign	Date/Time JUN 15 2016 1410	Matrix *
Relinquished By SSU #1	Print <i>[Signature]</i>	Sign	Date/Time JUN 16 2016 0815	Received By <i>Leahy Wall</i>	Print <i>[Signature]</i>	Sign	Date/Time JUN 16 2016 0815	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By <i>Leahy Wall</i>	Print <i>[Signature]</i>	Sign	Date/Time JUN 16 2016 1400	Received By <i>FEDEX</i>	Print <i>[Signature]</i>	Sign	Date/Time JUN 16 2016 1400	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Print	Sign	Date/Time	Received By <i>M. Kinston</i>	Print <i>[Signature]</i>	Sign	Date/Time 6-17-16	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time			

CH2M Hill Plateau Remediation Company
 C.O.C.# S16-006-284
 Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 3991688
 Telephone No. 509-376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. 6005-414
 Bill of Lading/Air Bill No. 6738
 Offsite Property No. 776541517555

Contact/Requester Karen Waters-Husted
 Sampling Origin Hanford Site
 Logbook No. HNF-N-506 86/31
 Method of Shipment Commercial Carrier
 Priority: 30 Days **PRIORITY**
 SPECIAL INSTRUCTIONS Hold Time
 N/A

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35CF2	N	6-16-16	1026	2x1-L P	9310_ALPHABETA_GPC: Gross Beta	6 Months	HNO3 to pH <2
B35CF2	N			1x1-L G/P	AMCMISO_EIE_PRECIP_AEA: COMMON	180 Days	HNO3 to pH <2
B35CF2	N			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35CF2	N			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B35CF2	N			2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35CF2	N			1x1-L G/P	PU241_IE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CF2	N			1x1-L G/P	PUISO_PLATE_AEA: COMMON	6 Months	HNO3 to pH <2
B35CF2	N			1x1-L G/P	SE79_SEP_IE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CF2	N			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35CF2	N			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35CF2	N			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35CF2	N	6-16-16	1036	3x1-L G/P	UIISO_IE_PRECIP_AEA: COMMON	6 Months	HNO3 to pH <2

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

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Dan Woehle CHPRG		<i>Dan Woehle</i>	JUN 16 2016 1255	Lesly Wall ICMERC		<i>Lesly Wall</i>	JUN 16 2016 1255	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
Relinquished By		<i>Lesly Wall</i>	JUN 16 2016 1400	FEDEX				
Relinquished By		<i>Lesly Wall</i>	JUN 16 2016 1400	Received By		<i>Matthew M. Fisher</i>	6-17-16 6900	
Relinquished By				Received By				

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 = FSR32012
 A-6004-842 (REV 2)

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>399588</u>
Received By: <u>ML</u>		Date Received: <u>6-17-16</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPM</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>130421961</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.				Circle Applicable: FedEx Air <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <input type="checkbox"/> <u>7765 4151 7897 2C</u> <u>7555 20^C NO ICE</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 12 July 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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL399588
Work Order #: 399588

Product: PUISO_PRECIP_AEA:COMMON
Analytical Method: PUISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1576179

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203571626	Method Blank (MB)
1203571627	399479001(B35CH2) Sample Duplicate (DUP)
1203571628	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 399588002 (B35CF2) was recounted due to poor resolution. The recount is reported.

Product: AMCMISO_EIE_PRECIP_AEA: COMMON
Analytical Method: AMCMISO_EIE_PREC_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1576183

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203571630	Method Blank (MB)
1203571631	399479001(B35CH2) Sample Duplicate (DUP)
1203571632	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: UISO_IE_PRECIP_AEA:COMMON
Analytical Method: UISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1576192

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203571666	Method Blank (MB)
1203571667	399479001(B35CH2) Sample Duplicate (DUP)
1203571668	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: 1575754

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203570525	Method Blank (MB)
1203570526	399283007(B35C93) Sample Duplicate (DUP)
1203570527	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.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203570526 (B35C93DUP), did not meet the Cs-137 relative error ratio requirement; however, both results are less than their respective MDCs.

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: 1575923

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203571035	Method Blank (MB)
1203571036	399283007(B35C93) Sample Duplicate (DUP)
1203571037	399283007(B35C93) Matrix Spike (MS)
1203571038	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: Gross Beta

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001 REV# 18

Analytical Batch: 1577403

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203574712	Method Blank (MB)
1203574713	399366006(B35D60) Sample Duplicate (DUP)
1203574714	399366006(B35D60) Matrix Spike (MS)
1203574715	399366006(B35D60) Matrix Spike Duplicate (MSD)
1203574716	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

Samples 1203574715 (B35D60MSD) and 1203574716 (LCS) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203574714 (B35D60MS) and 1203574715 (B35D60MSD), 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: 1577470

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588001	B35BC8
399588002	B35CF2
1203574968	Method Blank (MB)
1203574969	399704005(B359Y1) Sample Duplicate (DUP)
1203574970	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 1203574969 (B359Y1DUP) was recounted due to results more negative than the three sigma TPU. The second count is reported. Sample 399588002 (B35CF2) was recounted due to a suspected false positive. The recount is reported.

Product: PU241_IE_LSC: COMMON

Analytical Method: PU241_IE_LSC

Analytical Procedure: GL-RAD-A-035 REV# 17

Analytical Batch: 1576184

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203571634	Method Blank (MB)
1203571635	399479001(B35CH2) Sample Duplicate (DUP)
1203571636	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: SE79_SEP_IE_LSC: COMMON

Analytical Method: SE79_SEP_IE_LSC

Analytical Procedure: GL-RAD-A-031 REV# 11

Analytical Batch: 1575739

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203570472	Method Blank (MB)
1203570473	398770001(B35D12) Sample Duplicate (DUP)
1203570474	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.

Quality Control (QC) Information**QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: The laboratory control sample 1203570474 (LCS) does not meet the client's LCS requirement of 80-120%; however, it does meet GEL's standard LCS requirement of 75-125%. Reporting results.

Technical Information**Recounts**

Sample 1203570474 (LCS) was recounted due to high recovery. The recount is reported.

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

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

Analytical Batch: 1575749

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203570510	Method Blank (MB)
1203570511	399283007(B35C93) Sample Duplicate (DUP)
1203570512	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

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

Analytical Batch: 1576839

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203573300	Method Blank (MB)

1203573301	399283007(B35C93) Sample Duplicate (DUP)
1203573302	399283007(B35C93) Matrix Spike (MS)
1203573303	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: 1576854

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399588002	B35CF2
1203573364	Method Blank (MB)
1203573365	399283007(B35C93) Sample Duplicate (DUP)
1203573367	399283007(B35C93) Matrix Spike (MS)
1203573369	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: GEL399588 GEL Work Order: 399588

The Qualifiers in this report are defined as follows:

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:



Name: Theresa Austin

Date: 12 JUL 2016

Title: Group Leader

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588001	Date Collected: 06/15/2016 13:19	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35BC8	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1577470	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/06/2016 12:40	Aliquot: 300 mL	Instrument: PIC10B
Data File: S1577470r.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1577470		
Prep Date: 07/05/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	1.03	pCi/L	+/-0.910	0.924	1.46	2.00

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

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: PUIISO_PRECIP_AEA	Prep Basis: "As Received"
Batch ID: 1576179	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/05/2016 11:02	Aliquot: 0.4 L	Instrument: 1105
Data File: S0399588002_PU.1B.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 239.9998 min
Prep Batch: 1576179		
Prep Date: 07/01/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.002	pCi/L	+/-0.0921	0.0922	0.202	1.00
OER-100-70	Plutonium-239/240	U	0.0571	pCi/L	+/-0.101	0.101	0.153	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	2.75	4.93	pCi/L	55.7	(30%-105%)

Comments:

- 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.
- 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: AMCMISO_EIE_PREC_AEA	Prep Basis: "As Received"
Batch ID: 1576183	Analyst: MXS2	SOP Ref: GL-RAD-A-011
Run Date: 07/02/2016 10:51	Aliquot: 0.4 L	Instrument: 1112
Data File: S0399588002_AM.1A.gcnf	Prep Method: DOE EML HASL-300, Am-05	Count Time: 240 min
Prep Batch: 1576183		
Prep Date: 07/01/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14596-10-2	Americium-241	U	0.0235	pCi/L	+/-0.0648	0.0649	0.112	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Americium-243 Tracer	4.02	5.34	pCi/L	75.2	(30%-105%)

Comments:

- 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.
- 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: PU241_IE_LSC	Prep Basis: "As Received"
Batch ID: 1576184	Analyst: MXS2	SOP Ref: GL-RAD-A-035
Run Date: 07/08/2016 10:54	Aliquot: 0.4 L	Instrument: LSCRED
Data File: PU1576184.xls	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 40 min
Prep Batch: 1576184		
Prep Date: 07/01/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14119-32-5	Plutonium-241	U	4.31	pCi/L	+/-12.9	13.0	22.1	25.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	2.75	4.93	pCi/L	55.7	(30%-105%)

Comments:

- 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.
- 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

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SDG Number: GEL399588
 Lab Sample ID: 399588002

Client: CPRC001
 Date Collected: 06/15/2016 10:26
 Date Received: 06/17/2016 09:00

Project: CPRC0S16006
 Matrix: WATER

Client ID: B35CF2
 Batch ID: 1576192
 Run Date: 07/02/2016 10:50
 Data File: S0399588002_UU.1A.gcnf
 Prep Batch: 1576192
 Prep Date: 07/01/2016 00:00

Method: UIISO_IE_PRECIP_AEA
 Analyst: MXS2
 Aliquot: 0.4 L
 Prep Method: DOE EML HASL-300, U-02-R

Prep Basis: "As Received"
 SOP Ref: GL-RAD-A-011
 Instrument: 1005
 Count Time: 239.9998 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		1.57	pCi/L	+/-0.357	0.423	0.115	1.00
15117-96-1/13982-7	Uranium-235/236		0.148	pCi/L	+/-0.134	0.136	0.123	1.00
7440-61-1	Uranium-238		0.939	pCi/L	+/-0.279	0.311	0.127	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Uranium-232 Tracer	3.65	5.21	pCi/L	70.1	(30%-105%)
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Comments:

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.

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: GEL399588
Lab Sample ID: 399588002

Client: CPRC001
Date Collected: 06/15/2016 10:26
Date Received: 06/17/2016 09:00

Project: CPRC0S16006
Matrix: WATER

Client ID: B35CF2
Batch ID: 1577403
Run Date: 07/01/2016 11:30
Data File: AB1577403rr.xls
Prep Batch: 1577403
Prep Date: 06/30/2016 14:18

Method: 9310_ALPHABETA_GPC
Analyst: JXC9
Aliquot: 125 mL
Prep Method: EPA 900.0/SW846 9310

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-001
Instrument: PIC3C
Count Time: 60 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-47-2	Beta BETA		10.3	pCi/L	+/-3.13	3.56	3.63	4.00

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

- 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. 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1577470	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/11/2016 15:32	Aliquot: 300 mL	Instrument: PIC4C
Data File: S1577470r.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1577470		
Prep Date: 07/05/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.114	pCi/L	+/-0.433	0.433	0.795	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.80	7.37	mg	92.3	(40%-110%)

Comments:

- 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.
- 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: GEL399588
Lab Sample ID: 399588002

Client ID: B35CF2
Batch ID: 1575754
Run Date: 06/28/2016 10:32
Data File: G399588002.CNF;1
Prep Batch: 1575754
Prep Date: 06/24/2016 00:00

Client: CPRC001
Date Collected: 06/15/2016 10:26
Date Received: 06/17/2016 09:00

Method: 901.1_GAMMA_GS
Analyst: MXR1
Aliquot: 2 L
Prep Method: EPA 901.1

Project: CPRC0S16006
Matrix: WATER

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-013
Instrument: GAM30
Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14234-35-6	Antimony-125	U	1.23	pCi/L	+/-6.33	6.35	11.9	
13967-70-9	Cesium-134	U	1.42	pCi/L	+/-2.33	2.42	4.91	
10045-97-3	Cesium-137	U	-1.8	pCi/L	+/-2.32	2.47	3.76	15.0
10198-40-0	Cobalt-60	U	0.374	pCi/L	+/-2.12	2.12	4.34	
14683-23-9	Europium-152	U	-5.71	pCi/L	+/-6.27	6.80	10.5	
15585-10-1	Europium-154	U	-0.985	pCi/L	+/-6.40	6.42	12.1	
14391-16-3	Europium-155	U	-1.46	pCi/L	+/-8.11	8.14	14.2	
13966-00-2	Potassium-40	U	-6.08	pCi/L	+/-30.9	31.0	57.4	

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

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.

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

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SDG Number: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1575923	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 07/01/2016 06:41	Aliquot: 1.5 L	Instrument: XRAY1
Data File: I399588002.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 120 min
Prep Batch: 1575923		
Prep Date: 06/29/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.344	pCi/L	+/-0.571	0.572	0.647	1.00
Surrogate/Tracer recovery		Result	Nominal	Units	Recovery%	Acceptable Limits		

Comments:

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.

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: GEL399588
Lab Sample ID: 399588002

Client: CPRC001
Date Collected: 06/15/2016 10:26
Date Received: 06/17/2016 09:00

Project: CPRC0S16006
Matrix: WATER

Client ID: B35CF2
Batch ID: 1575739
Run Date: 06/24/2016 20:27
Data File: SE1575739R2.xls
Prep Batch: 1575739
Prep Date: 06/22/2016 00:00

Method: SE79_SEP_IE_LSC
Analyst: CXS7
Aliquot: 0.1 L
Prep Method: NERC ORD

Prep Basis: "As Received"
SOP Ref: GL-RAD-A-031
Instrument: LSCBLUE
Count Time: 60 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15758-45-9	Selenium-79	NU	2.56	pCi/L	+/-10.4	10.4	17.7	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Selenium Carrier	17.3	20.0	mg	86.5	(40%-110%)

Comments:

- 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.
- 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1575749	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 07/05/2016 20:45	Aliquot: 100 mL	Instrument: LSCBLUE
Data File: E1575749.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1575749		
Prep Date: 06/30/2016 12:36		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		114	pCi/L	+/-19.9	23.6	28.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	38200	43800	CPM	87.1	(30%-105%)

Comments:

- 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.
- 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2		Prep Basis: "As Received"
Batch ID: 1576839	Method: TRITIUM_DIST_LSC	SOP Ref: GL-RAD-A-002
Run Date: 06/30/2016 12:55	Analyst: TXJ1	Instrument: LSCRED
Data File: T1576839.xls	Aliquot: 50 mL	Count Time: 40 min
Prep Batch: 1576839	Prep Method: EPA 906.0 Modified	
Prep Date: 06/29/2016 15:40		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	69.0	pCi/L	+/-191	192	330	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

- 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.
- 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: GEL399588	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 399588002	Date Collected: 06/15/2016 10:26	Matrix: WATER
	Date Received: 06/17/2016 09:00	
Client ID: B35CF2		Prep Basis: "As Received"
Batch ID: 1576854	Method: C14_LSC	SOP Ref: GL-RAD-A-003
Run Date: 07/01/2016 09:40	Analyst: TXJ1	Instrument: LSCBROWN
Data File: C1576854.xls	Aliquot: 60 mL	Count Time: 30 min
Prep Batch: 1576854	Prep Method: EPA EERF C-01 Modified	
Prep Date: 06/30/2016 16:07		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14	U	-6.74	pCi/L	+/-18.6	18.6	32.6	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

- 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.
- TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
- The MDC is a sample specific MDC.

Quality Control Summary

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QC Summary

Report Date: July 12, 2016

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Client : CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 399588

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1576179								
QC1203571626	MB								
Plutonium-238			U	-0.0426	pCi/L			MXS2	07/02/1610:52
				Uncert: +/-0.060					
				TPU: +/-0.0601					
Plutonium-239/240			U	-0.0233	pCi/L				
				Uncert: +/-0.0788					
				TPU: +/-0.0789					
**Plutonium-242 Tracer	4.93			3.62	pCi/L	REC: 73	(30%-105%)		
				Uncert: +/-0.695					
				TPU: +/-1.02					
QC1203571627	399479001	DUP							
Plutonium-238		U	-0.00948	U	-0.00519	pCi/L			07/02/1610:52
			Uncert: +/-0.0419		+/-0.0448		RPD: 0	N/A	
			TPU: +/-0.042		+/-0.0449		RER: 0.137	(0-2)	
Plutonium-239/240		U	0.0261	U	0.104	pCi/L			
			Uncert: +/-0.0817		+/-0.115		RPD: 0	N/A	
			TPU: +/-0.0818		+/-0.116		RER: 1.07	(0-2)	
**Plutonium-242 Tracer	4.93		3.53		4.15	pCi/L	REC: 84	(30%-105%)	
			Uncert: +/-0.616		+/-0.643				
			TPU: +/-0.912		+/-0.949				
QC1203571628	LCS								
Plutonium-238			U	0.090	pCi/L				07/02/1610:53
				Uncert: +/-0.114					
				TPU: +/-0.115					
Plutonium-239/240	4.94			5.26	pCi/L	REC: 107	(80%-120%)		
				Uncert: +/-0.727					
				TPU: +/-1.08					
**Plutonium-242 Tracer	4.93			3.60	pCi/L	REC: 73	(30%-105%)		
				Uncert: +/-0.699					
				TPU: +/-1.03					
Batch	1576183								
QC1203571630	MB								
Americium-241			U	0.0516	pCi/L			MXS2	07/02/1610:53
				Uncert: +/-0.082					
				TPU: +/-0.0824					
**Americium-243 Tracer	5.34			4.97	pCi/L	REC: 93	(30%-105%)		
				Uncert: +/-0.647					
				TPU: +/-0.981					
QC1203571631	399479001	DUP							
Americium-241		U	0.0131	U	0.0078	pCi/L			07/02/1610:53
			Uncert: +/-0.0729		+/-0.0889		RPD: 0	N/A	
			TPU: +/-0.073		+/-0.089		RER: 0.0906	(0-2)	
**Americium-243 Tracer	5.34		3.12		4.13	pCi/L	REC: 77	(30%-105%)	
			Uncert: +/-0.719		+/-0.707				
			TPU: +/-1.08		+/-1.06				

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1576183								
QC1203571632	LCS								
Americium-241	4.93			4.46	pCi/L	REC: 91 (80%-120%)			07/02/1610:53
	Uncert:			+/-0.593					
	TPU:			+/-0.853					
*Americium-243 Tracer	5.34			4.80	pCi/L	REC: 90 (30%-105%)			
	Uncert:			+/-0.644					
	TPU:			+/-0.976					
Batch	1576184								
QC1203571634	MB								
Plutonium-241			U	8.39	pCi/L			MXS2	07/08/1611:36
	Uncert:			+/-9.88					
	TPU:			+/-10.1					
*Plutonium-242 Tracer	4.93			3.62	pCi/L	REC: 73 (30%-105%)			
	Uncert:			+/-0.695					
	TPU:			+/-1.02					
QC1203571635	399479001	DUP							
Plutonium-241		U	2.79	U	-4.75	pCi/L			07/08/1612:18
	Uncert:		+/-9.89		+/-8.17		RPD: 0 N/A		
	TPU:		+/-9.91		+/-8.17		RER: 1.15 (0-2)		
*Plutonium-242 Tracer	4.93		3.53		4.15	pCi/L	REC: 84 (30%-105%)		
	Uncert:		+/-0.616		+/-0.643				
	TPU:		+/-0.912		+/-0.949				
QC1203571636	LCS								
Plutonium-241	193			174	pCi/L	REC: 90 (80%-120%)			07/08/1613:00
	Uncert:			+/-12.8					
	TPU:			+/-40.2					
*Plutonium-242 Tracer	4.93			4.13	pCi/L	REC: 84 (30%-105%)			
	Uncert:			+/-0.651					
	TPU:			+/-0.960					
Batch	1576192								
QC1203571666	MB								
Uranium-233/234			U	0.0378	pCi/L			MXS2	07/02/1610:50
	Uncert:			+/-0.0752					
	TPU:			+/-0.0754					
Uranium-235/236			U	-0.011	pCi/L				
	Uncert:			+/-0.0486					
	TPU:			+/-0.0487					
Uranium-238			U	0.0148	pCi/L				
	Uncert:			+/-0.0665					
	TPU:			+/-0.0665					
*Uranium-232 Tracer	5.21			4.06	pCi/L	REC: 78 (30%-105%)			
	Uncert:			+/-0.621					
	TPU:			+/-0.956					
QC1203571667	399479001	DUP							
Uranium-233/234			0.216	0.271	pCi/L				
	Uncert:		+/-0.172	+/-0.150		RPD: 23 (0% - 100%)			
	TPU:		+/-0.175	+/-0.155		RER: 0.465 (0-2)			
Uranium-235/236		U	0.0167	U	0.112	pCi/L			
	Uncert:		+/-0.0926	+/-0.114		RPD: 0 N/A			
	TPU:		+/-0.0928	+/-0.115		RER: 1.26 (0-2)			

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1576192								
Uranium-238		0.195		0.290	pCi/L				
	Uncert:	+/-0.154		+/-0.155		RPD: 39	(0% - 100%)		
	TPU:	+/-0.157		+/-0.160		RER: 0.834	(0-2)		
**Uranium-232 Tracer	5.21	3.66		4.18	pCi/L	REC: 80	(30%-105%)		
	Uncert:	+/-0.732		+/-0.626					
	TPU:	+/-1.10		+/-0.963					
QC1203571668	LCS								
Uranium-233/234				5.71	pCi/L				
	Uncert:			+/-0.624					
	TPU:			+/-1.00					
Uranium-235/236				0.412	pCi/L				
	Uncert:			+/-0.196					
	TPU:			+/-0.204					
Uranium-238	6.73			6.02	pCi/L	REC: 89	(80%-120%)		
	Uncert:			+/-0.639					
	TPU:			+/-1.04					
**Uranium-232 Tracer	5.21			4.48	pCi/L	REC: 86	(30%-105%)		
	Uncert:			+/-0.603					
	TPU:			+/-0.934					
Rad Gamma Spec									
Batch	1575754								
QC1203570525	MB								
Antimony-125			U	-3.53	pCi/L			MXR1	06/29/1612:28
	Uncert:			+/-6.33					
	TPU:			+/-6.53					
Cesium-134			U	2.72	pCi/L				
	Uncert:			+/-2.58					
	TPU:			+/-2.86					
Cesium-137			U	0.0772	pCi/L				
	Uncert:			+/-2.19					
	TPU:			+/-2.19					
Cobalt-60			U	0.786	pCi/L				
	Uncert:			+/-2.51					
	TPU:			+/-2.53					
Europium-152			U	-1.29	pCi/L				
	Uncert:			+/-6.43					
	TPU:			+/-6.46					
Europium-154			U	-1.19	pCi/L				
	Uncert:			+/-6.57					
	TPU:			+/-6.59					
Europium-155			U	-3.92	pCi/L				
	Uncert:			+/-7.68					
	TPU:			+/-7.88					
Potassium-40			U	17.2	pCi/L				
	Uncert:			+/-30.0					
	TPU:			+/-31.0					
QC1203570526	399283007	DUP							
Antimony-125		U	-2.48	U	7.46	pCi/L			06/29/1612:59
	Uncert:		+/-7.56		+/-10.3		RPD: 0	N/A	
	TPU:		+/-7.64		+/-10.9		RER: 1.47	(0-2)	

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1575754								
Cesium-134		U	-1.86	U	2.17	pCi/L			
		Uncert:	+/-2.81		+/-5.31		RPD: 0	N/A	
		TPU:	+/-2.94		+/-5.40		RER: 1.28	(0-2)	
Cesium-137		U	0.109	U	6.40	pCi/L			
		Uncert:	+/-2.76		+/-4.63		RPD: 0	N/A	
		TPU:	+/-2.76		+/-4.64		RER: 2.28	(0-2)	
Cobalt-60		U	-1.37	U	-0.538	pCi/L			
		Uncert:	+/-3.43		+/-4.49		RPD: 0	N/A	
		TPU:	+/-3.49		+/-4.50		RER: 0.287	(0-2)	
Europium-152		U	2.60	U	-4.35	pCi/L			
		Uncert:	+/-10.9		+/-11.1		RPD: 0	N/A	
		TPU:	+/-11.0		+/-11.2		RER: 0.869	(0-2)	
Europium-154		U	-7.55	U	6.91	pCi/L			
		Uncert:	+/-11.0		+/-10.6		RPD: 0	N/A	
		TPU:	+/-11.5		+/-11.1		RER: 1.78	(0-2)	
Europium-155		U	-3.02	U	-1.94	pCi/L			
		Uncert:	+/-12.3		+/-12.8		RPD: 0	N/A	
		TPU:	+/-12.4		+/-12.8		RER: 0.12	(0-2)	
Potassium-40		U	26.9	U	8.19	pCi/L			
		Uncert:	+/-38.7		+/-46.2		RPD: 0	N/A	
		TPU:	+/-38.8		+/-46.2		RER: 0.61	(0-2)	
QC1203570527	LCS								
Americium-241	34400				36200	pCi/L	REC: 105 (80%-120%)		06/29/1614:35
		Uncert:			+/-917				
		TPU:			+/-2850				
Antimony-125				U	45.9	pCi/L			
		Uncert:			+/-200				
		TPU:			+/-201				
Cesium-134				U	41.9	pCi/L			
		Uncert:			+/-71.5				
		TPU:			+/-74.0				
Cesium-137	13400				14500	pCi/L	REC: 108 (80%-120%)		
		Uncert:			+/-310				
		TPU:			+/-695				
Cobalt-60	13500				13700	pCi/L	REC: 101 (80%-120%)		
		Uncert:			+/-326				
		TPU:			+/-600				
Europium-152				U	-52.7	pCi/L			
		Uncert:			+/-186				
		TPU:			+/-188				
Europium-154				U	35.6	pCi/L			
		Uncert:			+/-122				
		TPU:			+/-123				
Europium-155				U	-60.5	pCi/L			
		Uncert:			+/-216				
		TPU:			+/-218				
Potassium-40				U	-41.8	pCi/L			
		Uncert:			+/-237				
		TPU:			+/-237				
Batch	1575923								

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1575923								
QC1203571035	MB								
Iodine-129			U	0.0646	pCi/L			MJH1	07/01/1611:02
				Uncert:					
				TPU:					
QC1203571036	399283007	DUP							
Iodine-129		U	0.166	U	0.134				07/01/1611:02
				Uncert:	+/-0.361	+/-0.218	RPD: 0	N/A	
				TPU:	+/-0.369	+/-0.226	RER: 0.145	(0-2)	
QC1203571037	399283007	MS							
Iodine-129		U	0.166		25.2	pCi/L	REC: 90	(75%-125%)	07/01/1611:03
				Uncert:	+/-0.361	+/-3.28			
				TPU:	+/-0.369	+/-4.14			
QC1203571038	LCS								
Iodine-129		27.7			26.2	pCi/L	REC: 95	(80%-120%)	07/01/1611:08
				Uncert:	+/-2.90				
				TPU:	+/-3.88				
Rad Gas Flow									
Batch	1577403								
QC1203574712	MB								
Beta			U	-0.345	pCi/L			JXC9	07/01/1611:46
				Uncert:	+/-1.58				
				TPU:	+/-1.58				
QC1203574713	399366006	DUP							
Beta			49.0		48.8	pCi/L			07/01/1611:46
				Uncert:	+/-3.23	+/-5.21	RPD: 0	(0% - 20%)	
				TPU:	+/-8.75	+/-9.63	RER: 0.0305	(0-2)	
QC1203574714	399366006	MS							
Beta		876	49.0		1130	pCi/L	REC: 124	(75%-125%)	07/01/1611:50
				Uncert:	+/-3.23	+/-41.0			
				TPU:	+/-8.75	+/-193			
QC1203574715	399366006	MSD							
Beta		876	49.0		925	pCi/L	REC: 100	(75%-125%)	07/06/1614:30
				Uncert:	+/-3.23	+/-36.7	RPD: 20	(0%-20%)	
				TPU:	+/-8.75	+/-158	RER: 1.64	(0-2)	
QC1203574716	LCS								
Beta		292			345	pCi/L	REC: 118	(80%-120%)	07/07/1610:00
				Uncert:	+/-12.3				
				TPU:	+/-58.2				
Batch	1577470								
QC1203574968	MB								
Strontium-90			U	-0.308	pCi/L			KSD1	07/06/1613:36
				Uncert:	+/-0.968				
				TPU:	+/-0.969				
**Strontium Carrier		7.37			6.80	mg	REC: 92	(40%-110%)	
QC1203574969	399704005	DUP							
Strontium-90		U	0.777	U	-0.0764	pCi/L			07/07/1611:17
				Uncert:	+/-0.817	+/-0.466	RPD: 0	N/A	
				TPU:	+/-0.826	+/-0.466	RER: 1.76	(0-2)	
**Strontium Carrier		7.37	6.10		7.10	mg	REC: 96	(40%-110%)	
QC1203574970	LCS								

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1577470								
Strontium-90	72.9			82.0	pCi/L	REC: 112	(80%-120%)		
	Uncert:			+/-4.65					
	TPU:			+/-13.6					
**Strontium Carrier	7.37			7.10	mg	REC: 96	(40%-110%)		
Rad Liquid Scintillation									
Batch	1575739								
QC1203570472	MB								
Selenium-79			U	5.06	pCi/L			CXS7	06/24/1623:35
	Uncert:			+/-10.5					
	TPU:			+/-10.5					
**Selenium Carrier	20.0			17.3	mg	REC: 87	(40%-110%)		
QC1203570473	398770001	DUP							
Selenium-79		NU	1.64	NU	5.80	pCi/L			06/25/1600:37
	Uncert:	+/-11.3		+/-10.0		RPD: 0	N/A		
	TPU:	+/-11.3		+/-10.0		RER: 0.54	(0-2)		
**Selenium Carrier	20.0		16.0	18.1	mg	REC: 91	(40%-110%)		
QC1203570474	LCS								
Selenium-79	866		N	1050	pCi/L	REC: 121*	(80%-120%)		06/30/1619:28
	Uncert:			+/-30.7					
	TPU:			+/-42.8					
**Selenium Carrier	20.0			18.6	mg	REC: 93	(40%-110%)		
Batch	1575749								
QC1203570510	MB								
Technetium-99			U	-10.7	pCi/L			CXS7	07/05/1622:04
	Uncert:			+/-15.4					
	TPU:			+/-15.4					
**Technetium-99m Tracer	43800			39300	CPM	REC: 90	(30%-105%)		
QC1203570511	399283007	DUP							
Technetium-99		U	-17.2	U	-2.88	pCi/L			07/05/1622:36
	Uncert:	+/-15.6		+/-15.6		RPD: 0	N/A		
	TPU:	+/-15.6		+/-15.6		RER: 1.28	(0-2)		
**Technetium-99m Tracer	43800		38400	39600	CPM	REC: 90	(30%-105%)		
QC1203570512	LCS								
Technetium-99	861			837	pCi/L	REC: 97	(80%-120%)		07/05/1623:08
	Uncert:			+/-34.4					
	TPU:			+/-99.0					
**Technetium-99m Tracer	43800			39600	CPM	REC: 90	(30%-105%)		
Batch	1576839								
QC1203573300	MB								
Tritium			U	-159	pCi/L			TXJ1	06/30/1618:31
	Uncert:			+/-185					
	TPU:			+/-185					
QC1203573301	399283007	DUP							
Tritium		U	0.624	U	70.2	pCi/L			06/30/1619:13
	Uncert:	+/-189		+/-196		RPD: 0	N/A		
	TPU:	+/-189		+/-197		RER: 0.499	(0-2)		
QC1203573302	399283007	MS							
Tritium	2330	U	0.624	1890	pCi/L	REC: 81	(75%-125%)		06/30/1619:55
	Uncert:	+/-189		+/-279					

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1576839								
		TPU:	+/-189	+/-459					
QC1203573303	LCS								
Tritium	2330			2090	pCi/L	REC: 90 (80%-120%)			06/30/1620:37
		Uncert:		+/-287					
		TPU:		+/-495					
Batch	1576854								
QC1203573364	MB								
Carbon-14			U	-8.98	pCi/L			TXJ1	07/01/1613:51
		Uncert:		+/-18.5					
		TPU:		+/-18.5					
QC1203573365	399283007	DUP							
Carbon-14		U	0.650	U	1.82				07/01/1614:22
		Uncert:	+/-18.9		+/-18.9	RPD: 0	N/A		
		TPU:	+/-18.9		+/-18.9	RER: 0.0861	(0-2)		
QC1203573367	399283007	MS							
Carbon-14	1260	U	0.650		1210	pCi/L	REC: 96 (75%-125%)		07/01/1614:53
		Uncert:	+/-18.9		+/-43.1				
		TPU:	+/-18.9		+/-229				
QC1203573369	LCS								
Carbon-14	1260				1250	pCi/L	REC: 99 (80%-120%)		07/01/1615:25
		Uncert:			+/-43.7				
		TPU:			+/-237				

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.