



October 26, 2015

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

Re: CHPRC SAF S16-010
Work Order: 382303
SDG: GEL382303

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 03, 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,

Sarah Edwards for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: S16-010-159, S16-010-234 and S16-010-235
Enclosures



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Case Narrative

October 30, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S16-010
SDG: GEL382303

October 26, 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 October 03, 2015, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
382303001	B32N78
382303002	B32RJ2
382303003	B32RJ3

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.

October 30, 2015

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.



Sarah Edwards for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

62 105

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 382303
 C.O.C. # **S16-010-159**
 Page 1 of 1

Collector **J.R. Aguilar/CHPRC** Telephone No. **509-376-4650**
 SAF No. **S16-010** Purchase Order/Charge Code **303309**
 Project Title **SURV, OCTOBER 2015** Ice Chest No. **6205-110**
 Shipped To (Lab) **GEL Laboratories, LLC** Bill of Lading/Air Bill No. **77465562 8437**
 Protocol **SURV** Priority: **15 Days** Offsite Property No. **6017**
 SPECIAL INSTRUCTIONS **PRIORITY** Total Activity Exemption: Yes No
 N/A

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32N78	N	W	10-2-15	1049	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

October 30, 2015

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
J.R. Aguilar/CHPRC			OCT 02 2015 1105	L.D. Wall			OCT 02 2015 1105	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
L.D. Wall			OCT 02 2015 1400	Received By	FEDEX			
Relinquished By				M. Kinston			10-3-15 0900	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 PRINTED ON 9/28/2015
 FSR ID = FSR6929
 A-6004-842 (REV 2)

October 30, 2015

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **S16-010-234**
 Page 1 of 1

382303

Contact/Requester: Karen Waters-Husted Telephone No. 509-376-4650
 Sampling Origin: Hanford Site Purchase Order/Charge Code 300071
 Logbook No. HNF-N-506 76 / 69 Ice Chest No. 6005-116
 Method of Shipment: Commercial Carrier Bill of Lading/Air Bill No. 7746 5562 8437
 Priority: 30 Days Offsite Property No. 6017

PRIORITY
 SPECIAL INSTRUCTIONS: Hold Time
 N/A Total Activity Exemption: Yes No

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

Sample No.	Filter	* Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B32RJ2	N	W 10-1-15	1305	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
J.R. Aguilar/CHPRC			OCT 01 2015 1330	SSU #1			OCT 01 2015 1330	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
8 of 27			OCT 02 2015 0945	L.D. Wall CHPRC			OCT 02 2015 0945	
L.D. Wall CHPRC			OCT 02 2015 1400	FEDEX				
Relinquished By				Received By				
				M. Kuslow CHPRC			10-3-15 0900	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By	Date/Time
PRINTED ON	9/14/2015							

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

S16-010-235

Page 1 of 1

382303

Collector: J.R. Aguilar/CHPRC Telephone No. 509-376-4650
 SAF No. S16-010 Purchase Order/Charge Code 300071
 Project Title: SURV, OCTOBER 2015 Ice Chest No. 6017-116
 Shipped To (Lab): GEL Laboratories, LLC Bill of Lading/Air Bill No. 77465562 8437
 Protocol: SURV Priority: 30 Days Commercial Carrier: **PRIORITY**
 Method of Shipment: HNF-N-506 76 / 69 Offsite Property No. 6017

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

Sample No.	Filter	* No	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32RJ3	N	W	10-1-15	1305	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2

October 30, 2015

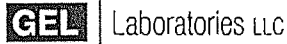
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
J.R. Aguilar/CHPRC			OCT 01 2015 1330	SSU-1			OCT 01 2015 1330	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
Relinquished By			OCT 02 2015 0945	LD. Wall CHPRC			OCT 02 2015 0945	
Relinquished By			OCT 02 2015 1400	LD. Wall CHPRC			OCT 02 2015 1400	
Relinquished By					FEDEX			
Relinquished By							10:375 0900	

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

October 30, 2015



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CARC</u>		SDG/AR/COC/Work Order:	
Received By: <u>MIC</u>		Date Received: <u>10-3-15</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPMD</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
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>F409202492L</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: FedEx Air <u>FedEx Ground</u> UPS Field Services Courier Other <u>7746 5270 1401 2c</u> <u>7746 5562 8437 2c</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

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

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

Radiological Analysis

October 30, 2015

Radiochemistry

Technical Case Narrative

CH2M Hill Plateau Remediation Company (CPRC)

SDG #: GEL382303

Work Order #: 382303

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Batch Number: 1512648

Sample ID	Client ID
382303001	B32N78
1203405935	Method Blank (MB)
1203405938	Laboratory Control Sample (LCS)
1203405936	382305001(B32T95) Sample Duplicate (DUP)
1203405937	382305001(B32T95) Matrix Spike (MS)

Sample 382303 001 in this SDG was 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 382305001 (B32T95).

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: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Batch Number: 1515849

Sample ID	Client ID
382303002	B32RJ2
382303003	B32RJ3
1203413702	Method Blank (MB)
1203413704	Laboratory Control Sample (LCS)
1203413703	382303002(B32RJ2) Sample Duplicate (DUP)

Samples 382303 002 and 003 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.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 382303002 (B32RJ2).

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 382303003 (B32RJ3) was recounted to verify sample results. 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.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

October 30, 2015

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

October 30, 2015

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: GEL382303 GEL Work Order: 382303

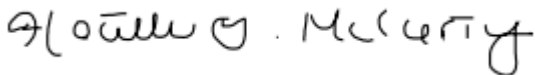
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Heather McCarty

Date: 29 OCT 2015

Title: Analyst II

Sample Data Summary

October 30, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL382303	Client: CPRC001	Project: CPRC0S16010
Lab Sample ID: 382303001	Date Collected: 10/02/2015 10:49	Matrix: WATER
	Date Received: 10/03/2015 09:00	
Client ID: B32N78	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1512648	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 10/12/2015 18:40	Aliquot: 50 mL	Instrument: LSCORANGE
Data File: T1512648R.xls	Prep Method: EPA 906.0 Modified	Count Time: 15.02965 min
Prep Batch: 1512648		
Prep Date: 10/08/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		11000	pCi/L	+/-721	2250	199	100

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

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

October 30, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL382303	Client: CPRC001	Project: CPRC0S16010
Lab Sample ID: 382303002	Date Collected: 10/01/2015 13:05	Matrix: WATER
	Date Received: 10/03/2015 09:00	
Client ID: B32RJ2	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1515849	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 10/27/2015 08:46	Aliquot: 200 mL	Instrument: LSCRED
Data File: E1515849.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 30 min
Prep Batch: 1515849		
Prep Date: 10/22/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		68.4	pCi/L	+/-10.3	12.8	14.2	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	68500	71800	CPM	95.4	(15%-125%)

Comments:

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

October 30, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL382303	Client: CPRC001	Project: CPRC0S16010
Lab Sample ID: 382303003	Date Collected: 10/01/2015 13:05	Matrix: WATER
	Date Received: 10/03/2015 09:00	
Client ID: B32RJ3	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1515849	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 10/27/2015 13:28	Aliquot: 300 mL	Instrument: LSCRED
Data File: E1515849R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1515849		
Prep Date: 10/22/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		55.6	pCi/L	+/-9.31	11.2	13.0	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	69400	71800	CPM	96.6	(15%-125%)

Comments:

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

Quality Control Data

GEL LABORATORIES LLC

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

QC Summary

Report Date: October 28, 2015
Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 382303

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1512648								
QC1203405935	MB								
Tritium			U	9.04	pCi/L			GXR1	10/13/1502:16
				Uncert: +/-46.3					
				TPU: +/-46.4					
QC1203405936	382305001	DUP							
Tritium		4330		4440	pCi/L				10/13/1504:18
				Uncert: +/-460		RPD: 3 (0% - 20%)			
				TPU: +/-955		RER: 0.159 (0-2)			
QC1203405937	382305001	MS							
Tritium		4330		6050	pCi/L	REC: 95 (75%-125%)			10/13/1504:36
				Uncert: +/-460					
				TPU: +/-955					
QC1203405938	LCS								
Tritium		1800		1550	pCi/L	REC: 86 (80%-120%)			10/13/1504:53
				Uncert: +/-286					
				TPU: +/-415					
Batch	1515849								
QC1203413702	MB								
Technetium-99			U	10.1	pCi/L			MYM1	10/27/1509:53
				Uncert: +/-6.21					
				TPU: +/-6.31					
**Technetium-99m Tracer		71800		63400	CPM	REC: 88 (15%-125%)			
QC1203413703	382303002	DUP							
Technetium-99		68.4		66.4	pCi/L				10/27/1510:28
				Uncert: +/-10.3		RPD: 3 (0% - 100%)			
				TPU: +/-12.8		RER: 0.215 (0-2)			
**Technetium-99m Tracer		71800		67100	CPM	REC: 93 (15%-125%)			
QC1203413704	LCS								
Technetium-99		287		292	pCi/L	REC: 102 (80%-120%)			10/27/1511:01
				Uncert: +/-12.1					
				TPU: +/-34.6					
**Technetium-99m Tracer		71800		66300	CPM	REC: 92 (15%-125%)			

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 >= 2X the MDA and, after corrections, result is >= 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

~~October 30, 2015~~
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QC Summary

Workorder: 382303

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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.