GEL Laboratories LLC

a member of The GEL Group INC

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

gel.com

June 27, 2016

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

Re: CHPRC SAF S16-004
Work Order: 394858
SDG: GEL394858

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 08, 2016. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. Per client P&D, the SAF was updated.

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,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: S16-004-176
Enclosures

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Problem and Discrepancy Report

Problem and Discrepancy Report

GEL

SDG GEL394858

06/02/16

The data package has the following issues:

The SAF number on the data package (S16-005) is the wrong SAF number. It should be S16-004.

Resolution: *Provide correction.*

Lab Response:

The lab will correct and re-submit the data package.

Provide a resolution to each issue noted on the report

Case Narrative

Per client P&D, the SAF was updated.

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S16-004
SDG: GEL394858

June 27, 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 April 08, 2016, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification
The laboratory received the following sample:

Laboratory Identification	Sample Description
394858001	B34M06

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.

6/27/2016

Heather Shaffer

Heather Shaffer
Project Manager

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL394858
Work Order #: 394858

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: COMMON

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

Technical Information

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

Recounts
Samples 1203525459 (Non SDG 394227001MSD) and 1203525460 (LCS) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203525458 (Non SDG 394227001MS) and 1203525459 (Non SDG 394227001MSD), aliquots were reduced to conserve sample volume.

TRITIUM_DIST_LSC: COMMON

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

Quality Control (QC) Information

QC Information
The blank, 1203524614 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information

Recounts
Sample 394858001 (B34M06) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Certification Statement

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

Chain of Custody and Supporting Documentation

91 lbs

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **S16-004-176**

Page 1 of ~~1~~ 2

2W4/7/16

Collector	K.C. Patterson/CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	S16-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071
Project Title	SURV, APRIL 2016	Logbook No.	HNF-N-506 85/32+33	Ice Chest No.	6WS-489
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7760 6112 0169
Protocol	CERCLA	Priority:	30 Days **PRIORITY**	Offsite Property No.	6503

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

394858

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

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B34M06	N	W	APR 0 6 2016	1241	2x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B34M06	N	W	↓	↓	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B34M06	N	W	↓	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.C. Patterson/CHPRC			APR 0 6 2016 1325	L.D. Wall CHPRC			APR 0 6 2016 1325
L.D. Wall CHPRC			APR 0 6 2016 1350	SSU-1			APR 0 6 2016 1350
SSU-1			APR 0 7 2016 0730	L.D. Wall CHPRC			APR 0 7 2016 0730
L.D. Wall CHPRC			APR 0 7 2016 1400	FEDEX			

Matrix *

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

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

PRINTED ON 2/18/2016 FSR ID = FSR25525 A-6004-842 (REV 2)

6/27/2016

Revision #1 27-JUN-2016 REV. 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. S16-004-176

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	FED EX				Patricia Dent	P. Dent	4/8/16 09:15

A-6003-962 (03/05)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	SDG/AR/COC/Work Order: 394858
Received By: P. Nent	Date Received: 4/8/16

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 20c
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 20140337
3	Chain of custody documents included with shipment?	X			
4	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		X		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		X		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		X		Sample ID's and containers affected:
9	Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	X			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
13	Number of containers received match number indicated on COC?	X			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			X	
15	COC form is properly signed in relinquished/received sections?	X			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7760 6110 0169 7760 6110 0423 7760 6699 7689 7760 6699 6741

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 4/8/16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

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

Report Date: 27−JUN−16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 27 June 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 #: GEL394858
Work Order #: 394858

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: 1558783

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

GEL Sample ID#	Client Sample Identification
394858001	B34M06
1203525563	Method Blank (MB)
1203525564	394858001(B34M06) Sample Duplicate (DUP)
1203525565	394858001(B34M06) Matrix Spike (MS)
1203525566	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **9310_ALPHABETA_GPC: COMMON**
Analytical Method: BETA_GPC
Analytical Procedure: GL-RAD-A-001 REV# 18
Analytical Batch: 1558748

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

GEL Sample ID#	Client Sample Identification
394858001	B34M06
1203525456	Method Blank (MB)
1203525457	394227001(NonSDG) Sample Duplicate (DUP)
1203525458	394227001(NonSDG) Matrix Spike (MS)
1203525459	394227001(NonSDG) Matrix Spike Duplicate (MSD)
1203525460	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 1203525459 (Non SDG 394227001MSD) and 1203525460 (LCS) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information

Additional Comments
The matrix spike and matrix spike duplicate, 1203525458 (Non SDG 394227001MS) and 1203525459 (Non SDG 394227001MSD), aliquots were reduced to conserve sample volume.

Product: **TRITIUM_DIST_LSC: COMMON**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 21
Analytical Batch: 1558488

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

GEL Sample ID#	Client Sample Identification
394858001	B34M06
1203524614	Method Blank (MB)
1203524615	394221001(NonSDG) Sample Duplicate (DUP)
1203524616	394221001(NonSDG) Matrix Spike (MS)
1203524617	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 blank, 1203524614 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information

Recounts
Sample 394858001 (B34M06) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL394858 GEL Work Order: 394858

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

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

Date: 29 APR 2016 **Title: Group Leader**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL394858**	**Client:**	**CPRC001**	**Project:**	**CPRC0S16005**
Lab Sample ID:	**394858001**	**Date Collected:**	**04/06/2016 12:41**	**Matrix:**	**WATER**
		Date Received:	**04/08/2016 09:15**		
Client ID:	**B34M06**			**Prep Basis:**	**"As Received"**
Batch ID:	**1558748**	**Method:**	**BETA_GPC**	**SOP Ref:**	**GL-RAD-A-001**
Run Date:	**04/19/2016 14:57**	**Analyst:**	**JXC9**	**Instrument:**	**LB4100F1**
Data File:	**AB1558748rr.xls**	**Aliquot:**	**150 mL**	**Count Time:**	**240 min**
Prep Batch:	**1558748**	**Prep Method:**	**EPA 900.0/SW846 9310**		
Prep Date:	**04/18/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha *ALPHA*	U	2.40	pCi/L	+/-1.64	1.69	2.50	3.00
12587-47-2	Beta *BETA*		40.1	pCi/L	+/-2.57	6.99	2.50	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	GEL394858	**Client:**	CPRC001	**Project:**	CPRC0S16005
Lab Sample ID:	394858001	**Date Collected:**	04/06/2016 12:41	**Matrix:**	WATER
		Date Received:	04/08/2016 09:15		
Client ID:	B34M06			**Prep Basis:**	"As Received"
Batch ID:	1558783	**Method:**	DOE EML HASL-300,I-01 Mo	**SOP Ref:**	GL-RAD-A-006
Run Date:	04/22/2016 09:12	**Analyst:**	MJH1	**Instrument:**	GAM05
Data File:	I394858001.CNF;1	**Aliquot:**	1.5 L	**Count Time:**	240 min
Prep Batch:	1558783	**Prep Method:**	DOE EML HASL-300,I-01 M		
Prep Date:	04/20/2016 00:00				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		4.28	pCi/L	+/-0.534	0.682	0.568	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	GEL394858	**Client:**	CPRC001	**Project:**	CPRC0S16005
Lab Sample ID:	394858001	**Date Collected:**	04/06/2016 12:41	**Matrix:**	WATER
		Date Received:	04/08/2016 09:15		
Client ID:	B34M06			**Prep Basis:**	"As Received"
Batch ID:	1558488	**Method:**	TRITIUM_DIST_LSC	**SOP Ref:**	GL-RAD-A-002
Run Date:	04/16/2016 01:22	**Analyst:**	TXJ1	**Instrument:**	LSCBROWN
Data File:	T1558488.xls	**Aliquot:**	50 mL	**Count Time:**	40 min
Prep Batch:	1558488	**Prep Method:**	EPA 906.0 Modified		
Prep Date:	04/14/2016 00:00				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		15700	pCi/L	+/-614	3100	351	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 29, 2016
Page 1 of 3

Client : **CH2MHill Plateau Remediation Company**
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: **Mr. Scot Fitzgerald**

Workorder: **394858**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch 1558783									
QC1203525563 MB									
Iodine-129			U	0.120	pCi/L			MJH1	04/25/1606:56
Uncert:				+/-0.380					
TPU:				+/-0.384					
QC1203525564 394858001 DUP									
Iodine-129		4.28		4.07	pCi/L				04/25/1606:58
Uncert:		+/-0.534		+/-1.07		RPD: 5	(0% - 20%)		
TPU:		+/-0.682		+/-1.15		RER: 0.298	(0-2)		
QC1203525565 394858001 MS									
Iodine-129	27.7	4.28		27.2	pCi/L	REC: 83	(75%-125%)		04/25/1608:09
Uncert:		+/-0.534		+/-2.76					
TPU:		+/-0.682		+/-3.88					
QC1203525566 LCS									
Iodine-129	27.7			24.7	pCi/L	REC: 89	(80%-120%)		04/25/1608:26
Uncert:				+/-3.45					
TPU:				+/-4.25					
Rad Gas Flow									
Batch 1558748									
QC1203525456 MB									
Alpha			U	-0.0136	pCi/L			JXC9	04/19/1614:58
Uncert:				+/-1.04					
TPU:				+/-1.04					
Beta			U	1.17	pCi/L				
Uncert:				+/-2.15					
TPU:				+/-2.16					
QC1203525457 394227001 DUP									
Alpha	U	1.13	U	0.691	pCi/L				04/19/1614:57
Uncert:		+/-1.40		+/-1.41		RPD: 0	N/A		
TPU:		+/-1.41		+/-1.42		RER: 0.429	(0-2)		
Beta		145		142	pCi/L				
Uncert:		+/-4.16		+/-4.14		RPD: 2	(0% - 20%)		
TPU:		+/-23.9		+/-23.3		RER: 0.205	(0-2)		
QC1203525458 394227001 MS									
Alpha	240 U	1.13		283	pCi/L	REC: 118	(75%-125%)		04/19/1614:58
Uncert:		+/-1.40		+/-27.7					
TPU:		+/-1.41		+/-56.3					
Beta	880	145		1230	pCi/L	REC: 123	(75%-125%)		
Uncert:		+/-4.16		+/-40.3					
TPU:		+/-23.9		+/-206					
QC1203525459 394227001 MSD									
Alpha	240 U	1.13		295	pCi/L	REC: 123	(75%-125%)		04/20/1613:21
Uncert:		+/-1.40		+/-28.0		RPD: 4	(0%-20%)		
TPU:		+/-1.41		+/-57.8		RER: 0.296	(0-2)		
Beta	880	145		1180	pCi/L	REC: 118	(75%-125%)		
Uncert:		+/-4.16		+/-39.5		RPD: 4	(0%-20%)		

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QC Summary

Workorder: 394858

Parmname	NOM		Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Gas Flow											
Batch 1558748											
	TPU:		+/-23.9		+/-203						
							RER:	0.335	(0-2)		
QC1203525460 LCS											
Alpha	79.9				68.2	pCi/L	REC:	85	(80%-120%)		04/25/1611:54
	Uncert:				+/-7.23						
	TPU:				+/-13.3						
Beta	293				337	pCi/L	REC:	115	(80%-120%)		
	Uncert:				+/-12.4						
	TPU:				+/-56.9						
Rad Liquid Scintillation											
Batch 1558488											
QC1203524614 MB											
Tritium				U	-82.6	pCi/L				TXJ1	04/16/1602:04
	Uncert:				+/-191						
	TPU:				+/-191						
QC1203524615 394221001 DUP											
Tritium		U	55.7	U	103	pCi/L					04/16/1602:46
	Uncert:		+/-200		+/-201		RPD:	0	N/A		
	TPU:		+/-200		+/-202		RER:	0.324	(0-2)		
QC1203524616 394221001 MS											
Tritium	2360	U	55.7		2590	pCi/L	REC:	110	(75%-125%)		04/16/1603:28
	Uncert:		+/-200		+/-307						
	TPU:		+/-200		+/-588						
QC1203524617 LCS											
Tritium	2350				2260	pCi/L	REC:	96	(80%-120%)		04/16/1604:09
	Uncert:				+/-292						
	TPU:				+/-526						

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
- 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

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QC Summary

Workorder: **394858**

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

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

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