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

www.gel.com

October 03, 2014

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

Re: CHPRC SAF A14-009
Work Order: 356207
SDG: GEL356207

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 06, 2014. 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,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: A14-009-001 and A14-009-002
Enclosures

Table of Contents

Case Narrative

General Narrative
for
Hanford MSA (51204)
CHPRC SAF A14-009
SDG: GEL356207

October 03, 2014

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 September 06, 2014, 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 samples were received and analyzed within hold time.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
356207001	B2XJN7
356207002	B2XJP1

Case Narrative

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

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

356207

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # A14-009-001

Collector	CHRIS FULTON CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	A14-009	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071ES20
Project Title	LLWMA(3)-PA, SEPTEMBER 2014	**Logbook No.**	HNF-N-506 65 / 90	**Ice Chest No.**	GW3.425
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7710 6077 6284
Protocol	Other	**Priority:**	30 Days PRIORITY	**Offsite Property No.**	5863

POSSIBLE SAMPLE HAZARDS/REMARKS

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

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2XJN7	N	W	9-5-14	0848	1x500-mL G/P	KPA_UTOT: COMMON	6 Months	HNO3 to pH <2
B2XJN7	N	W	↓	↓	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B2XJN7	N	W	↓	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

	Print	Sign	Date/Time		Print	Sign	Date/Time
Relinquished By	CHRIS FULTON CHPRC		9-5-14 1015	Received By	F.M. Hall CHPRC		9-5-14 1015
Relinquished By	F.M. Hall CHPRC		SEP 05 2014 1400	Received By	FEDEX		
Relinquished By	FEDX			Received By	P. Whent Patricia Dent		9/6/14 0900
Relinquished By				Received By			

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 O 7/17/2014

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # A14-009-002

Collector	CHRIS FULTON CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	A14-009	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071ES20
Project Title	LLWMA(3)-PA, SEPTEMBER 2014	**Logbook No.**	HNF-N-506 65/90	**Ice Chest No.**	GWS-425
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	~~7710 6077 6284~~ 7710 6077 6284
Protocol	Other	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	5063

POSSIBLE SAMPLE HAZARDS/REMARKS

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

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2XJP1	N	W	9-5-14	0939	1x500-mL G/P	KPA_UTOT: COMMON	6 Months	HNO3 to pH <2
B2XJP1	N	W	↓	↓	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B2XJP1	N	W	↓	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
CHRIS FULTON CHPRC		9-5-14	1015	F.M. Hall CHPRC		9-5-14	1015
F.M. Hall CHPRC		SEP 05 2014	1400	FEDEX			
FED X				P. Nent Patricia Dent		9/6/14	09:06

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 O 7/17/2014

A-6004-842 (REV 2)

OCTOBER 3, 2014

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: HMSA	**SDG/AR/COC/Work Order:** 356207
Received By: P. Valent	**Date Received:** 9/6/14

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 contatiners < 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 segregeated 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) 2C *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966
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	VOA vials free of headspace (defined as < 6mm bubble)?		X		Sample ID's and containers affected:
7	Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			
14	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7710 6077 6284-2c

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials PD Date 9/6/14 Page 1 of 1

Data Review Qualifier Definitions

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

Report Date: 03−OCT−14

Project Specific Qualifier Definitions for GEL Client Code: HMSA

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 (0rganics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely preformed
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 >= 2X the MDA and, after corrections, result is >= 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 >= 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 >= 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

Laboratory Certifications

List of current GEL Certifications as of 03 October 2014

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−14−9
Utah NELAP	SC000122014−14
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12
Wisconsin	999887790

Radiological Analysis

Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL356207
Work Order 356207

Method/Analysis Information

Product:	**KPA_UTOT: COMMON**
Analytical Method:	UTOT_KPA
Analytical Batch Number:	1417119

Sample ID	Client ID
356207001	B2XJN7
356207002	B2XJP1
1203162309	MB for batch 1417119
1203162312	Laboratory Control Sample (LCS)
1203162313	Laboratory Control Sample (LCS)
1203162310	356207001(B2XJN7) Sample Duplicate (DUP)
1203162311	356207001(B2XJN7) Matrix Spike (MS)

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

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-023 REV# 19.

Calibration Information:

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

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

Quality Control (QC) Information:

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

Designated QC
The following sample was used for QC: 356207001 (B2XJN7).

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis
Samples 356207001 (B2XJN7) and 356207002 (B2XJP1) were treated with a post-spike due to contractual requirements and reanalyzed to test for quenching. The post-spike verified the initial results, so the initial results are reported.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

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

Additional Comments
MB 1203162309 (MB) failed R2 and/or lifetime. This was due to insufficient uranium in the sample for measurement. The results are reported.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**TC99_EIE_LSC: COMMON**
Analytical Method:	TC99_EIE_LSC
Analytical Batch Number:	1418507

Sample ID	Client ID
356207001	B2XJN7
356207002	B2XJP1
1203165939	MB for batch 1418507
1203165941	Laboratory Control Sample (LCS)
1203165940	356431004(B2XH59) Sample Duplicate (DUP)

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

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

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

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

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

Quality Control (QC) Information:

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

Designated QC
The following sample was used for QC: 356431004 (B2XH59).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

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

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Samples 1203165939 (MB), 1203165941 (LCS), 356207001 (B2XJN7) and 356207002 (B2XJP1) were recounted to verify sample results. Recounts are reported. Sample 1203165940 (B2XH59) was recounted to verify sample results and due to high MDC. Second recount is reported.

Miscellaneous Information:

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

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

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**TRITIUM_DIST_LSC: COMMON**
Analytical Method:	TRITIUM_DIST_LSC

Analytical Batch Number: 1418820

Sample ID	Client ID
356207001	B2XJN7
356207002	B2XJP1
1203166815	MB for batch 1418820
1203166818	Laboratory Control Sample (LCS)
1203166816	356403002(B2X7N8) Sample Duplicate (DUP)
1203166817	356403002(B2X7N8) Matrix Spike (MS)

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

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

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

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

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

Quality Control (QC) Information:

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

Designated QC
The following sample was used for QC: 356403002 (B2X7N8).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

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

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Samples 1203166816 (B2X7N8), 1203166817 (B2X7N8) and 1203166818 (LCS) were recounted due to low recovery. The recounts are reported. Samples 1203166815 (MB), 356207001 (B2XJN7) and 356207002 (B2XJP1) were recounted due to low recovery and then recounted due to high MDCs. The third counts 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.

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

HMSA001 Hanford MSA (51204)

Client SDG: GEL356207 GEL Work Order: 356207

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: Kate Gellatly**

Date: 02 OCT 2014 **Title: Analyst I**

Sample Data Summary

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

Certificate of Analysis

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

Report Date: October 2, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF A14-009

Client Sample ID: B2XJN7
Sample ID: 356207001
Matrix: WATER
Collect Date: 05-SEP-14
Receive Date: 06-SEP-14
Collector: Client

Project: HMSA0A14009
Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis													
TC99_EIE_LSC: COMMON "As Received"													
Technetium-99	U	5.28	+/-6.42	10.8	+/-6.45	15.0	pCi/L		MYM 1	09/30/14	1341	1418507	1
TRITIUM_DIST_LSC: COMMON "As Received"													
Tritium	U	28.3	+/-51.1	87.7	+/-51.4	100	pCi/L		BYS1	09/29/14	2314	1418820	2
Rad Total Uranium													
KPA_UTOT: COMMON "As Received"													
Total Uranium		0.941	+/-0.0261	0.233	+/-0.082	1.00	ug/L	1	JAOC	09/30/14	1233	1417119	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Tc-02-RC Modified
2	EPA 906.0 Modified
3	ASTM D 5174

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Technetium-99m Tracer	TC99_EIE_LSC: COMMON "As Received"	1418507	97.6	(15%-125%)

Notes:

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

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

Certificate of Analysis

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

Report Date: October 2, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF A14-009

Client Sample ID: B2XJP1
Sample ID: 356207002
Matrix: WATER
Collect Date: 05-SEP-14
Receive Date: 06-SEP-14
Collector: Client

Project: HMSA0A14009
Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis													
TC99_EIE_LSC: COMMON "As Received"													
Technetium-99		13.0	+/-6.27	10.1	+/-6.43	15.0	pCi/L		MYM1	09/30/14	1408	1418507	1
TRITIUM_DIST_LSC: COMMON "As Received"													
Tritium	U	35.1	+/-51.8	88.2	+/-52.2	100	pCi/L		BYS1	09/30/14	0216	1418820	2
Rad Total Uranium													
KPA_UTOT: COMMON "As Received"													
Total Uranium		1.27	+/-0.0328	0.233	+/-0.110	1.00	ug/L	1	JAOC	09/30/14	1235	1417119	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Tc-02-RC Modified
2	EPA 906.0 Modified
3	ASTM D 5174

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Technetium-99m Tracer	TC99_EIE_LSC: COMMON "As Received"	1418507	102	(15%-125%)

Notes:

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

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

Workorder: **356207**

Report Date: October 2, 2014

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1418507									
QC1203165939 MB									
Technetium-99			U	9.04	pCi/L			MYM1	09/30/1415:31
Uncert:				+/-6.55					
TPU:				+/-6.62					
QC1203165940 356431004 DUP									
Technetium-99	U	6.69	U	10.8	pCi/L				10/01/1410:23
Uncert:		+/-8.54		+/-7.98		RPD: 0	N/A		
TPU:		+/-8.57		+/-8.07		RER: 0.686	(0-2)		
QC1203165941 LCS									
Technetium-99	290			259	pCi/L	REC: 89	(80%-120%)		09/30/1416:27
Uncert:				+/-12.2					
TPU:				+/-31.2					
Batch 1418820									
QC1203166815 MB									
Tritium			U	49.4	pCi/L			BYS1	09/30/1405:19
Uncert:				+/-50.4					
TPU:				+/-51.3					
QC1203166816 356403002 DUP									
Tritium		1160		1050	pCi/L				09/26/1420:40
Uncert:		+/-144		+/-140		RPD: 10	(0% - 20%)		
TPU:		+/-266		+/-247		RER: 0.593	(0-2)		
QC1203166817 356403002 MS									
Tritium	1910	1160		2800	pCi/L	REC: 86	(75%-125%)		09/26/1422:13
Uncert:		+/-144		+/-340					
TPU:		+/-266		+/-639					
QC1203166818 LCS									
Tritium	1910			1750	pCi/L	REC: 92	(80%-120%)		09/26/1422:45
Uncert:				+/-268					
TPU:				+/-432					
Rad Total U									
Batch 1417119									
QC1203162309 MB									
Total Uranium			U	0.0079	ug/L			JAOC	09/30/1412:46
Uncert:				+/-0.00153					
TPU:				+/-0.00166					
QC1203162310 356207001 DUP									
Total Uranium		0.941		0.888	ug/L				09/30/1412:49
Uncert:		+/-0.0261		+/-0.0236		RPD: 6	(0% - 100%)		
TPU:		+/-0.082		+/-0.077		RER: 0.923	(0-2)		
QC1203162311 356207001 MS									
Total Uranium	50.0	0.941		54.7	ug/L	REC: 108	(75%-125%)		09/30/1412:52
Uncert:		+/-0.0261		+/-3.38					
TPU:		+/-0.082		+/-5.64					
QC1203162312 LCS									
						REC:			

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QC Summary

Workorder: **356207**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Total U									
Batch 1417119									
Total Uranium	50.0			54.5	ug/L	109	(80%-120%)		
	Uncert:			+/-3.39					
	TPU:			+/-5.63					
QC1203162313 LCS									
Total Uranium	5.00			5.22	ug/L REC:	104	(80%-120%)		09/30/1412:56
	Uncert:			+/-0.130					
	TPU:			+/-0.450					

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.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

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