

OCTOBER 2, 2014



a member of **The GEL Group** INC



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2040 Savage Road Charleston, SC 29407

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www.gel.com

October 02, 2014

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

Re: CHPRC F14-021
Work Order: 356065
SDG: GEL356065

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 05, 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,

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

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: F14-021-015 and F14-021-016
Enclosures



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Case Narrative

**General Narrative
for
Hanford MSA (51204)
CHPRC F14-021
SDG: GEL356065**

October 02, 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 05, 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 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
356065001	B2XPR0
356065002	B2XPP9

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: General Chemistry and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-021-016	PAGE 1 OF 1
COLLECTOR <i>P.S. HAWKEY</i>	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION 105KW Monthly Set 1 + 2, Pt 10	PROJECT DESIGNATION 105KW Monthly Sampling - Water		SAF NO. F14-021	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. 6005-431	FIELD LOGBOOK NO. <i>HNF-N-251-4</i>	ACTUAL SAMPLE DEPTH N/A	COA 300416ES20	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. SEE PTR	BILL OF LADING/AIR BILL NO. SEE PTR			

MATRIX*	PRESERVATION	HNO3 to pH
A=Air		<2
DL=Drum	HOLDING TIME	6 Months
Liquids		
DS=Drum	TYPE OF CONTAINER	G/P
Solids		
L=Liquid	NO. OF CONTAINER(S)	1
O=Oil		
S=Soil	VOLUME	1L
SE=Settlement	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
T=Tissue		
V=Vegetation		
W=Water		
WI=Wipe		
X=Other		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B2XPR0	WATER	09-04-14	0855

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-14-154	
<i>P.S. HAWKEY</i>	09-04-14 0857	L.D. Wall	SEP 04 2014 0857	(1) GAMMA_GS: COMMON {Cesium-137}; AMCMISO EIE_PLATE_AEA: COMMON {Americium-241}; PUIISO_PLATE_AEA: COMMON; UIISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON;	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
L.D. Wall	SEP 04 2014 1400	<i>FED X</i>			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>FED X</i>		<i>P. Went Patreleia Dent</i>	9-5-14 09:30		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
				TRVL-14-154	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY		TITLE		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY		



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WCHN</u>		SDG/AR/COC/Work Order: <u>356065</u>
Received By: <u>P. Wient</u>		Date Received: <u>9/5/14</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input 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>1 MR/PH</u>
Classified Radioactive I or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input 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#: <u>2910</u>
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"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <u>OC</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<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"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7710 4509 1007</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

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 (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

Laboratory Certifications

List of current GEL Certifications as of 02 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

General Chem Analysis

Case Narrative

**General Chemistry Narrative
Hanford MSA (HMSA)
SDG GEL356065**

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1417292 **Method:** 9056_ANIONS_IC: COMMON + (add-on)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
356065002	B2XPP9
1203162811	MB for batch 1417292
1203162812	Laboratory Control Sample (LCS)
1203162813	Laboratory Control Sample Duplicate (LCSD)

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-GC-E-086 REV# 23.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The LCSD spike recovery met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD between the LCS and LCSD met the acceptance limits.

Quality Control (QC) Designation

No samples were selected for QC analysis. Please see the additional comments section of the Narrative for details.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

The following sample's aliquot from this sample group was received outside of the method specified holding time: 356065002 (B2XPP9).

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1336147. 356065002 (B2XPP9).

Manual Integrations

Manual integrations were not required for the samples in this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Specific Conductivity
Analytical Batch: 1418955 **Method:** 120.1_CONDUCTIVITY: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

Sample ID	Client ID
356065002	B2XPP9
1203167145	Laboratory Control Sample (LCS)
1203167146	355524001(B2W5B6) 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-GC-E-009 REV# 11.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB(s) analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

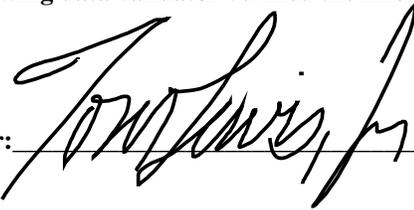
Certification Statement

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.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:  Date: 02Oct14

Sample Data Summary

GEL LABORATORIES LLC

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

**Certificate of Analysis Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL356065 GEL Work Order: 356065

The Qualifiers in this report are defined as follows:

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).

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

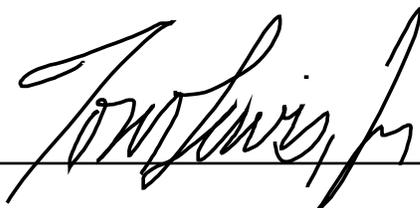
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by



GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC F14-021**

Report Date: October 2, 2014

Client Sample ID: B2XPP9
 Lab Sample ID: 356065002
 Matrix: WATER
 Collect Date: 04-SEP-14 08:55
 Receive Date: 05-SEP-14
 Collector: Client

Project: HMSA00151
 Client ID: HMSA001
 Client SDG: GEL356065

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
<i>9056_ANIONS_IC: COMMON + (add-on) "As Received"</i>												
Bromide	U	67.0	67.0	200	250	ug/L	1	MAR1	09/08/14	20:42	1417292	1
Chloride		308	67.0	200	200	ug/L	1					
Fluoride	B	53.0	33.0	100	500	ug/L	1					
Nitrate-N	X	3720	33.0	100	250	ug/L	1					
Nitrite-N	UX	38.0	38.0	100	250	ug/L	1					
Phosphorus in phosphate	UX	67.0	67.0	200	500	ug/L	1					
Sulfate		768	133	400	500	ug/L	1					

Titration and Ion Analysis

120.1_CONDUCTIVITY: COMMON "As Received"

Conductivity		86.2	1.00	1.00	1.00	umhos/cm	1	SXC5	09/16/14	10:33	1418955	2
--------------	--	------	------	------	------	----------	---	------	----------	-------	---------	---

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9056A	
2	EPA 120.1	

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: October 2, 2014

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 356065

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1417292										
QC1203162812	LCS										
Bromide	1250			1280	ug/L		102	(90%-110%)	MAR1	09/08/14	19:40
Chloride	5000			4770	ug/L		95.5	(90%-110%)			
Fluoride	2500			2470	ug/L		98.9	(90%-110%)			
Nitrate-N	2500			2420	ug/L		96.7	(90%-110%)			
Nitrite-N	2500			2410	ug/L		96.3	(90%-110%)			
Phosphorus in phosphate	1250			1180	ug/L		94.2	(90%-110%)			
Sulfate	10000			9810	ug/L		98.1	(90%-110%)			
QC1203162813	LCSD										
Bromide	1250			1270	ug/L	0.314	102	(0%-20%)		09/08/14	20:11
Chloride	5000			4780	ug/L	0.134	95.6	(0%-20%)			
Fluoride	2500			2440	ug/L	1.27	97.6	(0%-20%)			
Nitrate-N	2500			2430	ug/L	0.565	97.2	(0%-20%)			
Nitrite-N	2500			2440	ug/L	1.31	97.5	(0%-20%)			
Phosphorus in phosphate	1250			1230	ug/L	4.50	98.6	(0%-20%)			
Sulfate	10000			9810	ug/L	0.0408	98.1	(0%-20%)			
QC1203162811	MB										
Bromide			U	ND	ug/L					09/08/14	19:09
Chloride			U	ND	ug/L						
Fluoride			U	ND	ug/L						
Nitrate-N			U	ND	ug/L						
Nitrite-N			U	ND	ug/L						

GEL LABORATORIES LLC

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

QC Summary

Workorder: 356065

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
----------	-----	--------	------	----	-------	------	------	-------	-------	------	------

Ion Chromatography

Batch 1417292

Phosphorus in phosphate			U	ND	ug/L				MAR1	09/08/14	19:09
-------------------------	--	--	---	----	------	--	--	--	------	----------	-------

Sulfate			U	ND	ug/L						
---------	--	--	---	----	------	--	--	--	--	--	--

Titration and Ion Analysis

Batch 1418955

QC1203167146 355524001 DUP											
Conductivity		2000		2000	umhos/cm	0.100		(0%-10%)	SXC5	09/16/14	10:32

QC1203167145 LCS											
Conductivity	1410			1420	umhos/cm		100	(95%-105%)		09/16/14	10:27

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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).
- 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.
- 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.
 ^ 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.

* Indicates that a Quality Control parameter was not within specifications.
 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.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 22-SEP-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1417292	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 356065(GEL356065)			
Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: 356065 002		1. Aliquot was received from Rad Aliquoting out of holding.	

Originator's Name:
Mary Sherwood 22-SEP-14

Data Validator/Group Leader:
Thomas Lewis 02-OCT-14

Radiological Analysis

**Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL356065
Work Order 356065**

Method/Analysis Information

Product: AMCMISO_EIE_PLATE_AEA: (HIGH RAD)

Analytical Method: AMCMISO_EIE_PREC_AEA

Analytical Batch Number: 1417428

Sample ID	Client ID
356065001	B2XPR0
1203163162	MB for batch 1417428
1203163164	Laboratory Control Sample (LCS)
1203163163	356065001(B2XPR0) 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-011 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 356065001 (B2XPR0).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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 1203163163 (B2XPR0) and 356065001 (B2XPR0) were recounted to reduce tailing. 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. The following DER was generated for this SDG: DER 1336991 was generated due to RDL less than MDA. 1. Samples 356065001 and 1203163163 did not meet the Cm-243/244 detection limit due to the small sample aliquots used. The blank, 1203163162, did not meet the Am-241 and Cm-243/244 detection limits due to keeping the volume consistent with the other sample aliquots. 1. The sample aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interferences. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: PUIISO_PLATE_AEA:COMMON (HIGH RAD)

Analytical Method: PUIISO_PLATE_AEA

Analytical Batch Number: 1417429

Sample ID	Client ID
356065001	B2XPR0
1203163165	MB for batch 1417429
1203163167	Laboratory Control Sample (LCS)
1203163166	356065001(B2XPR0) 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-011 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 356065001 (B2XPR0).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Pu-238 blank activity is greater than the MDC but is less than five percent of the lowest activity in the batch. The blank, 1203163165 (MB), did not meet the Pu-239/240 detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

Manual integrations of alpha spectroscopy spectra 1203163165 (MB), 1203163166 (B2XPR0) and 356065001 (B2XPR0) were performed to fully separate counts in Regions of Interest which would have been biased.

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: UISO_IE_PRECIP_AEA:COMMON (HIGH RAD)

Analytical Method: UISO_IE_PRECIP_AEA

Analytical Batch Number: 1417430

Sample ID	Client ID
356065001	B2XPR0
1203163168	MB for batch 1417430
1203163170	Laboratory Control Sample (LCS)
1203163169	356065001(B2XPR0) 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-011 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 356065001 (B2XPR0).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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 high 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. The following DER was generated for this SDG: DER 1337358 was generated due to RDL less than MDA. 1. Sample 356065001 does not meet the detection limits for U-235/236 and the Method blank 1203163168 does not meet the detection limits for U-233/234, U-235/236, and U-238 due to small aliquots used. 1. Sample aliquot was reduced due to high levels of U-233/234 and U-238 activity in the sample. The Method blank aliquot was reduced in order to keep consistent with the sample aliquots. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GAMMA_GS:COMMON (Cs137) HIGH RAD

Analytical Method: 901.1_GAMMA_GS

Analytical Batch Number: 1417433

Sample ID	Client ID
356065001	B2XPR0
1203163178	MB for batch 1417433
1203163180	Laboratory Control Sample (LCS)
1203163179	356065001(B2XPR0) 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-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 356065001 (B2XPRO).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank 1203163178 (MB) did not meet the Cs-137 detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRTOT_SEP_PRECIP_GPC: COMMON (HIGH RAD)

Analytical Method: SRTOT_SEP_PRECIP_GPC

Analytical Batch Number: 1417431

Sample ID	Client ID
356065001	B2XPR0
1203163171	MB for batch 1417431
1203163173	Laboratory Control Sample (LCS)
1203163172	356065001(B2XPR0) 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-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 356065001 (B2XPR0).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank 1203163171

(MB) activity is greater than the MDC but is less than five percent of the lowest activity in the batch.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON (HIGH RAD)
Analytical Method: TRITIUM_DIST_LSC
Analytical Batch Number: 1417432

Sample ID	Client ID
356065002	B2XPP9
1203163174	MB for batch 1417432
1203163177	Laboratory Control Sample (LCS)
1203163175	356065002(B2XPP9) Sample Duplicate (DUP)
1203163176	356065002(B2XPP9) 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: 356065002 (B2XPP9).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Matrix Spike 1203163176 (B2XPP9) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration. The blank, 1203163174 (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:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

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.

DATA EXCEPTION REPORT

Mo.Day Yr. 24-SEP-14	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1417428	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 356065(GEL356065)			
Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 356065001 and 1203163163 did not meet the Cm-243/244 detection limit due to the small sample aliquots used. The blank, 1203163162, did not meet the Am-241 and Cm-243/244 detection limits due to keeping the volume consistent with the other sample aliquots.</p>		<p>1. The sample aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interferences. Reporting results.</p>	

Originator's Name:

Melanie Aycock 24-SEP-14

Data Validator/Group Leader:

Jessica Davis 26-SEP-14

DATA EXCEPTION REPORT

Mo.Day Yr. 25-SEP-14	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1417430	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 356065(GEL356065)			
Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample 356065001 does not meet the detection limits for U-235/236 and the Method blank 1203163168 does not meet the detection limits for U-233/234, U-235/236, and U-238 due to small aliquots used.		1. Sample aliquot was reduced due to high levels of U-233/234 and U-238 activity in the sample. The Method blank aliquot was reduced in order to keep consistent with the sample aliquots. Reporting results.	

Originator's Name:

Jessica Downey 25-SEP-14

Data Validator/Group Leader:

Jessica Davis 26-SEP-14

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: GEL356065 GEL Work Order: 356065

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: 26 SEP 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

Contact: Mr. Scot Fitzgerald
 Project: CHPRC F14-021

Report Date: September 26, 2014

Client Sample ID: B2XPR0
 Sample ID: 356065001
 Matrix: WATER
 Collect Date: 04-SEP-14
 Receive Date: 05-SEP-14
 Collector: Client

Project: HMSA00151
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing													
<i>AMCMISO_EIE_PLATE_AEA: (HIGH RAD) "As Received"</i>													
Americium-241		6220	+/-601	45.3	+/-1240	1.00	pCi/L		NXP2	09/24/14	0943	1417428	1
Curium-243/244	U	13.1	+/-41.6	62.7	+/-41.7	1.00	pCi/L						
<i>GAMMA_GS:COMMON (Cs137) HIGH RAD "As Received"</i>													
Cesium-137		7.71E+06	+/-5070	1060	+/-6.27E+05	15.0	pCi/L		JXC5	09/19/14	1120	1417433	2
<i>PUISO_PLATE_AEA:COMMON (HIGH RAD) "As Received"</i>													
Plutonium-238		1600	+/-219	57.3	+/-308	1.00	pCi/L		NXP2	09/15/14	1500	1417429	3
Plutonium-239/240		13900	+/-638	46.7	+/-1970	1.00	pCi/L						
<i>SRTOT_SEP_PRECIP_GPC: COMMON (HIGH RAD) "As Received"</i>													
Total Strontium		3.94E+06	+/-5470	56.3	+/-9.11E+05	2.00	pCi/L		JXC5	09/15/14	1453	1417431	4
<i>UIISO_IE_PRECIP_AEA:COMMON (HIGH RAD) "As Received"</i>													
Uranium-233/234		302	+/-138	132	+/-150	1.00	pCi/L		NXP2	09/24/14	1323	1417430	5
Uranium-235/236	U	0.00	+/-35.7	48.8	+/-35.9	1.00	pCi/L						
Uranium-238		138	+/-91.2	77.2	+/-94.8	1.00	pCi/L						

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	EPA 901.1
3	DOE EML HASL-300, Pu-11-RC Modified
4	EPA 905.0 Modified
5	DOE EML HASL-300, U-02-RC Modified

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		AMCMISO_EIE_PLATE_AEA: (HIGH RAD) "As Received"	1417428	100	(15%-125%)
Plutonium-236 Tracer		PUISO_PLATE_AEA:COMMON (HIGH RAD) "As Received"	1417429	65.5	(15%-125%)
Strontium Carrier		SRTOT_SEP_PRECIP_GPC: COMMON (HIGH RAD) "As Received"	1417431	84.1	(25%-125%)
Uranium-232 Tracer		UIISO_IE_PRECIP_AEA:COMMON (HIGH RAD) "As Received"	1417430	26.0	(15%-125%)

OCTOBER 2, 2014

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
Contact: Mr. Scot Fitzgerald
Project: CHPRC F14-021
Client Sample ID: B2XPR0
Sample ID: 356065001

Report Date: September 26, 2014

Project: HMSA00151
Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test					Batch ID	Recovery%	Acceptable Limits				

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

OCTOBER 2, 2014

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: September 26, 2014

Contact: Mr. Scot Fitzgerald

Project: CHPRC F14-021

Client Sample ID: B2XPP9
Sample ID: 356065002
Matrix: WATER
Collect Date: 04-SEP-14
Receive Date: 05-SEP-14
Collector: Client

Project: HMSA00151
Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing													
<i>TRITIUM_DIST_LSC: COMMON (HIGH RAD) "As Received"</i>													
Tritium		1.27E+06	+/-32200	14600	+/-2.47E+05	100	pCi/L		JXC5	09/16/14	2219	1417432	1

The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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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

Report Date: September 26, 2014

Page 1 of 4

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 356065

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1417428								
QC1203163162	MB								
Americium-241			U	6.59	pCi/L			NXP2	09/15/1415:00
				Uncert: +/-18.5					
				TPU: +/-18.5					
Curium-243/244			U	3.38	pCi/L				
				Uncert: +/-18.8					
				TPU: +/-18.8					
QC1203163163	356065001	DUP							
Americium-241		6220		6410	pCi/L				09/24/1409:43
				Uncert: +/-601		RPD: 3 (0% - 20%)			
				TPU: +/-1240		RER: 0.201 (0-2)			
Curium-243/244		U	13.1	U	37.8	pCi/L			
				Uncert: +/-41.6		RPD: 0 N/A			
				TPU: +/-41.7		RER: 0.600 (0-2)			
QC1203163164	LCS								
Americium-241	1410			1490	pCi/L	REC: 106 (80%-120%)			09/15/1415:00
				Uncert: +/-184					
				TPU: +/-254					
Curium-243/244	2810			2940	pCi/L	REC: 105 (80%-120%)			
				Uncert: +/-257					
				TPU: +/-430					
Batch	1417429								
QC1203163165	MB								
Plutonium-238				50.8	pCi/L			NXP2	09/15/1415:00
				Uncert: +/-42.7					
				TPU: +/-43.3					
Plutonium-239/240			U	9.23	pCi/L				
				Uncert: +/-25.4					
				TPU: +/-25.4					
QC1203163166	356065001	DUP							
Plutonium-238		1600		1500	pCi/L				
				Uncert: +/-219		RPD: 6 (0% - 20%)			
				TPU: +/-308		RER: 0.454 (0-2)			
Plutonium-239/240		13900		13800	pCi/L				
				Uncert: +/-638		RPD: 0 (0% - 20%)			
				TPU: +/-1970		RER: 0.0049 (0-2)			
QC1203163167	LCS								
Plutonium-238			U	1.87	pCi/L				
				Uncert: +/-35.0					
				TPU: +/-35.0					
Plutonium-239/240	1970			2160	pCi/L	REC: 110 (80%-120%)			
				Uncert: +/-264					
				TPU: +/-400					
Batch	1417430								

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1417430								
QC1203163168	MB								
Uranium-233/234			U	35.9	pCi/L			NXP2	09/24/1413:23
				Uncert: +/-53.5					
				TPU: +/-53.8					
Uranium-235/236			U	12.7	pCi/L				
				Uncert: +/-37.5					
				TPU: +/-37.5					
Uranium-238			U	-0.206	pCi/L				
				Uncert: +/-41.7					
				TPU: +/-41.8					
QC1203163169	356065001	DUP							
Uranium-233/234		302		243	pCi/L				09/24/1413:23
				Uncert: +/-138		RPD: 22	(0% - 100%)		
				TPU: +/-150		RER: 0.607	(0-2)		
Uranium-235/236		U	0.00	73.2	pCi/L				
				Uncert: +/-35.7		RPD: 40	(0% - 100%)		
				TPU: +/-35.9		RER: 1.76	(0-2)		
Uranium-238				138	pCi/L				
				Uncert: +/-91.2		RPD: 45	(0% - 100%)		
				TPU: +/-94.8		RER: 1.08	(0-2)		
QC1203163170	LCS								
Uranium-233/234				2940	pCi/L				09/24/1413:23
				Uncert: +/-391					
				TPU: +/-679					
Uranium-235/236				215	pCi/L				
				Uncert: +/-122					
				TPU: +/-129					
Uranium-238		2720		2730	pCi/L	REC: 100	(80%-120%)		
				Uncert: +/-377					
				TPU: +/-638					
Batch	1417431								
QC1203163171	MB								
Total Strontium				80.3	pCi/L			JXC5	09/15/1414:53
				Uncert: +/-40.2					
				TPU: +/-44.3					
QC1203163172	356065001	DUP							
Total Strontium		3.94E+06		3.80E+06	pCi/L				09/15/1414:53
				Uncert: +/-5470		RPD: 4	(0% - 20%)		
				TPU: +/-9.11E+05		RER: 0.226	(0-2)		
QC1203163173	LCS								
Total Strontium		11200		12800	pCi/L	REC: 114	(80%-120%)		09/15/1414:53
				Uncert: +/-311					
				TPU: +/-2970					
Batch	1417432								
QC1203163174	MB								
Tritium			U	8.61	pCi/L			JXC5	09/16/1423:21
				Uncert: +/-8310					
				TPU: +/-8310					
QC1203163175	356065002	DUP							
Tritium		1.27E+06		1.21E+06	pCi/L				09/17/1400:23

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1417432								
		Uncert:	+/-32200	+/-31600					
		TPU:	+/-2.47E+05	+/-2.37E+05		RPD: 4	(0% - 20%)		
						RER: 0.305	(0-2)		
QC1203163176	356065002	MS							
Tritium	88000	1.27E+06		1.27E+06	pCi/L	REC: N/A			09/17/1401:26
		Uncert:	+/-32200	+/-31800					
		TPU:	+/-2.47E+05	+/-2.47E+05					
QC1203163177	LCS								
Tritium	87800			88000	pCi/L	REC: 100	(80%-120%)		09/17/1402:28
		Uncert:		+/-11700					
		TPU:		+/-20600					
Batch	1417433								
QC1203163178	MB								
Cesium-137			U	22.3	pCi/L			JXC5	09/19/1411:21
		Uncert:		+/-37.8					
		TPU:		+/-39.1					
QC1203163179	356065001	DUP							
Cesium-137		7.71E+06		8.02E+06	pCi/L				09/19/1413:57
		Uncert:	+/-5070	+/-5320		RPD: 4	(0% - 20%)		
		TPU:	+/-6.27E+05	+/-6.68E+05		RER: 0.657	(0-2)		
QC1203163180	LCS								
Americium-241	2.89E+05			3.05E+05	pCi/L	REC: 106	(80%-120%)		09/19/1411:21
		Uncert:		+/-9840					
		TPU:		+/-31700					
Cobalt-60	90800			95900	pCi/L	REC: 106	(80%-120%)		
		Uncert:		+/-2650					
		TPU:		+/-8280					
Cesium-137	1.02E+05			1.05E+05	pCi/L	REC: 103	(80%-120%)		
		Uncert:		+/-2380					
		TPU:		+/-9610					

Notes:

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

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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).
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- 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.
- 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

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