

CH2MHILL • BWXT West Valley, LLC

West Valley Demonstration Project

Mr. Bryan C. Bower, Contracting Officer's Representative
U. S. Department of Energy
West Valley Demonstration Project
10282 Rock Springs Road
West Valley, New York 14171-9799

AC-PRES
WD:2020:0753
September 8, 2020

ATTENTION: Stephen M. Bousquet

SUBJECT: Contract No. DE-EM0001529, Main Plant Process Building and Vitrification Facility Characterization Data Packages

REFERENCE: Letter JJP:379953 – 547.1 (DW:2019:0063), Bryan C. Bower to Scott A. Anderson, "Main Plant Process Building (MPPB) and Vitrification Facility Characterization Data Packages," dated January 16, 2019

Dear Mr. Bower:

In response to your request for information in the above referenced letter, CH2M HILL BWXT West Valley, LLC (CHBWV) is transmitting the data packages described in Attachment A (i.e., Radiological Controls survey reports and analytical data packages) for the Main Plant Process Building. This information was gathered at the request of DOE and in accordance with WVDP-584, Revision 1 and is in addition to data packages transmitted on February 13, 2019.

Transmittal of the remaining data packages listed in Attachment A will be made prior to the end of this contract.

Please direct any questions regarding this information to Scott Chase at Extension 2184.

Sincerely,

Approval Obtained Electronically

John D. Rendall
President & General Manager

JDR:CD:bnj

Attachments: A) MPPB Sample Status, August 27, 2020
B) SAP Data Packages, August 27, 2020

cc: S. W. Chase, CHBWV
A. M. Cooney, DOE-EMCBC
T. D. Dogal, CHBWV
L. K. Hollfelder, CHBWV
L. J. Ortega, CHBWV
J. D. Rendall, CHBWV
K. R. Whitham, CHBWV
K. A. Wooley, CHBWV

MPPB Sample Status – Part 2
August 27, 2020

Areas Included in this Data Package

Acronym	Area Sampled
CAA	Cell Access Aisle
CPC	Chemical Process Cell
GCRE	General Purpose Cell Crane Room Extension
HEV	Head-End Ventilation
Mini Cell	Miniature Cell
Mini Cell Airlock	Miniature Cell Airlock
MRR	Manipulator Repair Room
OGC	Off-Gas Cell
RER	Ram Equipment Room
XC-2	Extraction Cell - 2
XC-3	Extraction Cell - 3

Areas Remaining to be transmitted prior to Contract Completion

Acronym	Area to Sample	Status	Samples requiring Analysis
MOA PITS	Mechanical Operating Aisle Pits	Surveys and Sample to be taken	1
PPH	Product Packaging and Handling Area	Survey to be taken	0
EDR	Equipment Decontamination Room	Survey	0
FRS	Fuel Receiving and Storage Area – Obtain information after Proposal work	Survey and Sample	2
GCR	General Purpose Cell Crane Room – Obtain information after Proposal work	Survey and Sample	2
GPC	General Purpose Cell – Obtain information after Proposal work	Survey	0
LI/LO	Load In/Load Out Building – Obtain information after Proposal work	Survey	0
PPCN	Product Purification Cell North – Obtain information after Proposal work	Survey and Sample	1
PPCS	Product Purification Cell South – Obtain information after Proposal work	Samples obtained Need Surveys after Nitrocision	2
SRR	Scrap Removal Room – Obtain information after Proposal work	Survey and Sample	1

MPPB Data Packages

CAA - Cell Access Aisle

This page intentionally left blank



May 04, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 476214
SDG: 420-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 11, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

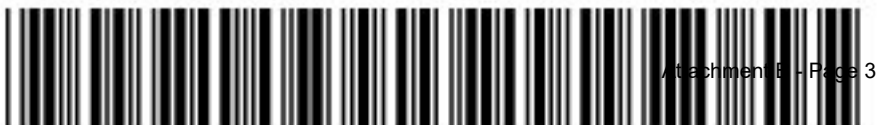
Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

May 4, 2019

Release Number

420

Purchase Order Number

CH-003169

Charge #

WV01.02.06.01.04.10.01

Description

CAA Floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 420-003169
Work Order: 476214

May 04, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

420

Charge Number

WV01.02.06.01.04.10.01

Summary

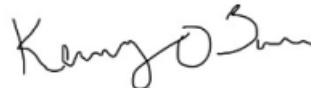
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 11, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
476214001	CAA Floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

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

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

476214

WD:2020-0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL
2. Charge #: WV01.02.06.01.04.10.01
3. Analysis Requested
4. Electronic Disk? Yes [] No [x]
5. PO #: CH-003169
6. Release #: 420
7. Report Format Level: I [x] II []
8. Cognizant Engineer/Project: MPPB Demo
9. Priority Code: Routine [x]
10. DQO/SAP#: WVDP-584
11. Report Data To: W. Connors
Comments

12.		13.				
Sample ID#	Type	# Cont.	Pres.	Date	Time	pH
<u>CAA floor</u>	<u>Grab</u>	<u>1</u>	<u>na</u>	<u>3-28-18</u>	<u>10:00</u>	<u>na</u>

14. Phase (Circle one): Solid Liquid Sludge Other:

15. Sample Bottle Size: 1000 mL Sample Bottle Type (Circle One): Glass

16. 210 mCi/Alpha NA []

17. Chain-of-Custody Reviewed by: Kian Wheeler

18. Gross Wt (g) 148 Phase (Circle one): Solid Liquid Sludge Other:

Tare Wt (g) 103.8 Type (Circle one): Smear Particulate Other: Smear

Net Wt (g) 44.2 Sample Bottle Type (Circle One): Poly

19. Sample Custodian Signature/Date/Time
Kian Wheeler 3-28-18 / 1310 Received by: Paul Wheeler 3-28-18 1310

Released by: Paul Wheeler 4-10-19 1306 Received by: [Signature] 4/11/19 855

Temperature 20 °C
Cooler Seals Intact? Yes [x] No []

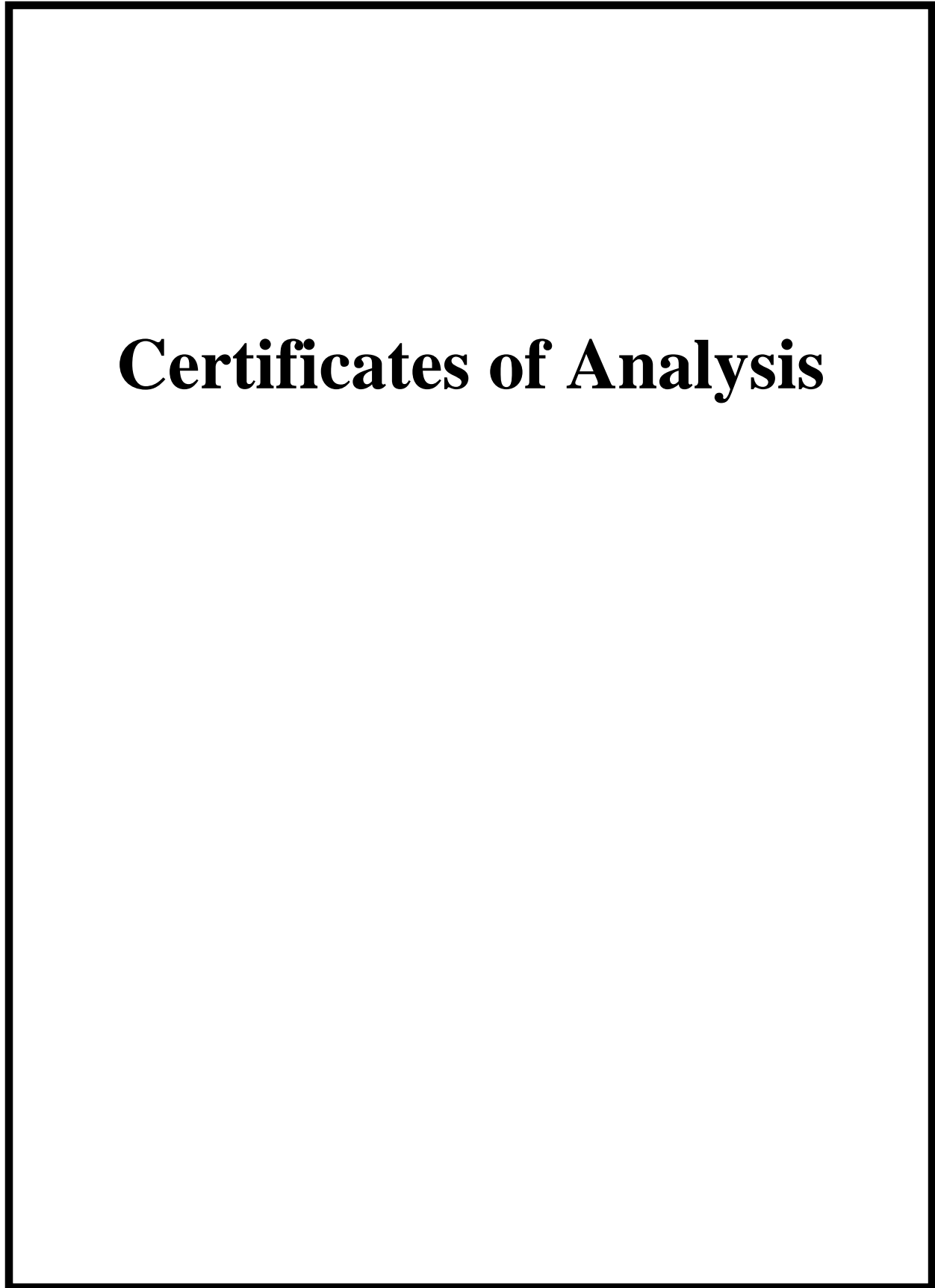
20. Sample Receipt:
Temperature 20 °C
Cooler Seals Intact? Yes [x] No []



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>476212 / 476214</u>	
Received By: <u>Greg Austin</u>		Date Received: <u>4/11/19</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other <u>81071470 9760</u>	
Suspected Hazard Information		Yes	No
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>		Hazard Class Shipped: UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples to be received as radioactive?	<input checked="" type="checkbox"/>		COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>3000 CPM</u> /mR/Hr Classified as: Rad 1 <input type="checkbox"/> Rad 2 <input checked="" type="checkbox"/> Rad 3 <input type="checkbox"/>
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/>		COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/>		If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:
Sample Receipt Criteria		Yes	NA
1 Shipping containers received intact and sealed?		<input checked="" type="checkbox"/>	
2 Chain of custody documents included with shipment?		<input checked="" type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*			<input checked="" type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?		<input checked="" type="checkbox"/>	
5 Sample containers intact and sealed?		<input checked="" type="checkbox"/>	
6 Samples requiring chemical preservation at proper pH?			<input checked="" type="checkbox"/>
7 Do any samples require Volatile Analysis?			<input checked="" type="checkbox"/>
8 Samples received within holding time?		<input checked="" type="checkbox"/>	
9 Sample ID's on COC match ID's on bottles?		<input checked="" type="checkbox"/>	
10 Date & time on COC match date & time on bottles?		<input checked="" type="checkbox"/>	
11 Number of containers received match number indicated on COC?		<input checked="" type="checkbox"/>	
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"/>	
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials WV Date 4/12 Page 1 of 1



Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: May 4, 2019

Client Sample ID: CAA Floor
 Sample ID: 476214001
 Matrix: Misc Solid
 Collect Date: 28-MAR-18
 Receive Date: 11-APR-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238	Hh	0.0144	+/-0.00189	0.00051	+/-0.00422	1.00E-06	uCi/g			JXB7	04/23/19	2022	1870155	1
Plutonium-239/240	Hh	0.0314	+/-0.00276	0.000421	+/-0.00867	1.00E-06	uCi/g							
Plutonium-242	HUh	0.000176	+/-0.000277	0.000421	+/-0.000281	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	HUh	-3.43E-05	+/-0.000112	0.000262	+/-0.000112	1.00E-06	uCi/g			JXB7	04/18/19	1601	1864678	2
Uranium-233/234	HUh	-1.54E-06	+/-6.46E-05	0.000145	+/-6.46E-05	1.00E-06	uCi/g							
Uranium-235/236	HUh	5.74E-05	+/-8.62E-05	0.000134	+/-8.68E-05	1.00E-06	uCi/g							
Uranium-238	HUh	5.66E-05	+/-7.73E-05	0.000105	+/-7.80E-05	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90	HUh	8.48E-05	+/-6.36E-05	8.73E-05	+/-6.54E-05	1.00E-04	uCi/g			JXB7	04/19/19	0727	1864681	3
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	H	0.0285	+/-9.50E-05	3.15E-05	+/-0.00441		uCi/g			AXM6	04/19/19	0803	1866818	4
Cesium-137	H	0.00022	+/-4.23E-06	7.59E-07	+/-1.84E-05	1.00E-05	uCi/g							
Cobalt-60	H	6.76E-06	+/-1.20E-06	6.49E-07	+/-1.45E-06		uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pr	Dissolution Soil Prep GL-RAD-A-015	AXM6	04/12/19	1415	1866819

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1870155	82.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	82.6	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	63.2	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1864681	111	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: May 4, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CAA Floor
 Sample ID: 476214001

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 4, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 476214

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
QC1204254055	474903001	DUP									
Uranium-232	Hh	0.000279	H	0.000412	uCi/g	38.5		(0% - 100%)	JXB7	04/23/19	22:19
Uranium-233/234	Hh	0.000573	H	0.000834	uCi/g	37.1*		(0%-20%)			
Uranium-235/236	HUh	2.40E-05	H	7.87E-05	uCi/g	74.6		(0% - 100%)			
Uranium-238	HUh	6.02E-05	HU	8.86E-05	uCi/g	N/A		N/A			
QC1204254057	LCS										
Uranium-232			U	3.77E-05	uCi/g					04/18/19	23:20
Uranium-233/234				0.00329	uCi/g						
Uranium-235/236				0.000262	uCi/g						
Uranium-238	0.00359			0.00359	uCi/g		100	(75%-125%)			
QC1204254054	MB										
Uranium-232			U	4.35E-05	uCi/g					04/18/19	16:01
Uranium-233/234			U	6.24E-07	uCi/g						
Uranium-235/236			U	4.96E-06	uCi/g						
Uranium-238			U	9.53E-06	uCi/g						
QC1204254056	474903001	MS									
Uranium-232	Hh	0.000279	H	0.000269	uCi/g					04/23/19	22:19

WD:2020:0753 - Attachment B

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

QC Summary

Workorder: 476214

Page 2 of 5

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
Uranium-233/234	Hh	0.000573	H	0.00391	uCi/g				JXB7	04/23/19	22:19
Uranium-235/236	HUh	2.40E-05	H	0.000196	uCi/g						
Uranium-238	0.00359 HUh	6.02E-05	H	0.00311	uCi/g		84.9	(75%-125%)			
Batch	1864681										
QC1204254061	474903001	DUP									
Strontium-90	Hh	0.141	H	0.124	uCi/g	12.7		(0%-20%)	JXB7	04/19/19	07:28
QC1204254063	LCS										
Strontium-90	0.00302			0.00258	uCi/g		85.4	(75%-125%)		04/19/19	07:28
QC1204254060	MB										
Strontium-90			U	3.13E-05	uCi/g					04/19/19	07:28
QC1204254062	474903001	MS									
Strontium-90	0.00317 Hh	0.141	H	0.129	uCi/g		N/A	(75%-125%)		04/19/19	07:28
Batch	1866818										
QC1204259093	476212001	DUP									
Americium-241	H	0.000167	H	0.000153	uCi/g	8.51		(0%-20%)	AXM6	04/19/19	10:49
Cobalt-60	H	5.31E-06	H	5.51E-06	uCi/g	3.74		(0%-20%)			
Cesium-137	H	0.042	H	0.0474	uCi/g	12.1		(0%-20%)			
QC1204259094	LCS										
Americium-241	0.00346			0.00367	uCi/g		106	(75%-125%)		04/19/19	10:50
Cobalt-60	0.00105			0.00118	uCi/g		112	(75%-125%)			
Cesium-137	0.00131			0.00148	uCi/g		113	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476214

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1866818										
QC1204259092	MB										
Americium-241			U	3.81E-07	uCi/g				AXM6	04/19/19	08:14
Cobalt-60			U	4.04E-08	uCi/g						
Cesium-137			U	8.17E-09	uCi/g						
Batch	1870155										
QC1204266874	476212001	DUP									
Plutonium-238	Hh	0.000117	HU	8.83E-05	uCi/g	22.2		(0% - 100%)	JXB7	04/24/19	08:35
Plutonium-239/240	Hh	0.000199	H	0.000136	uCi/g	37.7		(0% - 100%)			
Plutonium-242	HUh	2.73E-05	HU	2.25E-05	uCi/g	N/A		N/A			
QC1204266876	LCS										
Plutonium-238			U	3.53E-05	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352			0.00376	uCi/g		107	(75%-125%)			
Plutonium-242			U	6.30E-05	uCi/g						
QC1204266873	MB										
Plutonium-238			U	2.82E-05	uCi/g					04/24/19	08:35
Plutonium-239/240			U	3.26E-05	uCi/g						
Plutonium-242			U	3.65E-05	uCi/g						
QC1204266875	476212001	MS									
Plutonium-238	Hh	0.000117	H	0.000136	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352	Hh	0.000199	H	0.00405	uCi/g		110	(75%-125%)		

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476214

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch		1870155									
Plutonium-242	HUh	2.73E-05	HU	5.31E-05	uCi/g				JXB7	04/23/19	20:22

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- UL Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Other specific qualifiers were required to properly define the results. Consult case narrative.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476214

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	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.

^ 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.

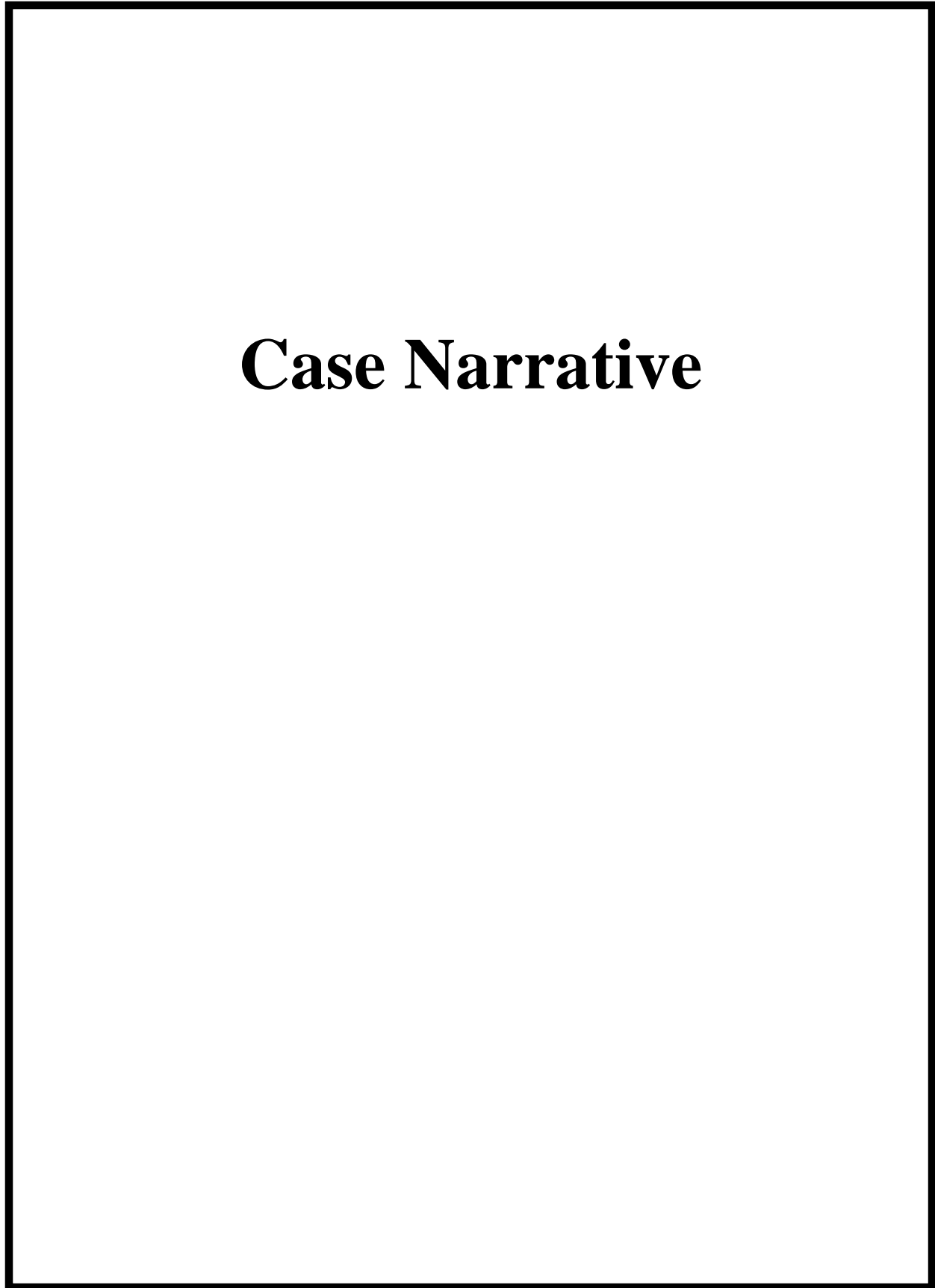
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 04 May 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 420-003169
Work Order #: 476214

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1864678**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476214001	CAA Floor
1204254054	Method Blank (MB)
1204254055	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254056	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254057	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**Duplication Criteria between QC Sample and Duplicate Sample**

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-233/234	RPD 37.1* (0.00%-20.00%) RER 1.38 (0-3)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254054 (MB)	Uranium-232	Result 0.0000435 < MDA 0.000147 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.000000624 < MDA 0.0000713 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Uranium-235/236	Result 0.00000496 < MDA 0.0000654 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000953 < MDA 0.0000713 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-238	Result 0.0000886 < MDA 0.000109 > RDL 0.000001 uCi/g
476214001 (CAA Floor)	Uranium-232	Result -0.0000343 < MDA 0.000262 > RDL 0.000001 uCi/g
	Uranium-233/234	Result -0.00000154 < MDA 0.000145 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.0000574 < MDA 0.000134 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.0000566 < MDA 0.000105 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204254055 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254056 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476214001 (CAA Floor)	Received 11-APR-19, out of holding 24-SEP-18

Recounts

The U-232 and U-236 traced portions of samples 1204254055 (XC-2 Floor DebrisDUP) and 1204254056 (XC-2 Floor DebrisMS) were given additional clean-up steps and recounted in order to remove suspected Plutonium interference. The recounts are being reported.

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1870155

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

WD:2020:0753 - Attachment B

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476214001	CAA Floor
1204266873	Method Blank (MB)
1204266874	476212001(RER Floor) Sample Duplicate (DUP)
1204266875	476212001(RER Floor) Matrix Spike (MS)
1204266876	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.

Preparation Information

Aliquot Reduced

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204266873 (MB)	Plutonium-238	Result 0.0000282 < MDA 0.0000767 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000326 < MDA 0.000105 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000365 < MDA 0.0000977 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g
476214001 (CAA Floor)	Plutonium-242	Result 0.000176 < MDA 0.000421 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204266874 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
1204266875 (RER FloorMS)	Received 11-APR-19, out of holding 24-SEP-18

WD:2020:0753 - Attachment B

476214001 (CAA Floor)

Received 11-APR-19, out of holding 24-SEP-18

Sample Re-prep/Re-analysis

Samples were repreped due to high activity. The reanalysis is being reported.

Recounts

Samples 1204266873 (MB) and 1204266874 (RER FloorDUP) were recounted due to high MDCs. The recounts are reported.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476214001	CAA Floor

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: Gammaspec, Cs137 Only, solid High Rad

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1866818

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476214001	CAA Floor
1204259092	Method Blank (MB)
1204259093	476212001(RER Floor) Sample Duplicate (DUP)
1204259094	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.

WD:2020:0753 - Attachment B

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204259093 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
476214001 (CAA Floor)	Received 11-APR-19, out of holding 24-SEP-18

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	476214001	CAA Floor

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1864681

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476214001	CAA Floor
1204254060	Method Blank (MB)
1204254061	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254062	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254063	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**Matrix Spike (MS) Recovery**

The Matrix Spike (See Below) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

WD:2020:0753 - Attachment B

Sample	Analyte	Value
1204254062 (XC-2 Floor DebrisMS)	Strontium-90	-399* (75%-125%), but result > 5x nominal

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204254061 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254062 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476214001 (CAA Floor)	Received 11-APR-19, out of holding 24-SEP-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 420-003169 GEL Work Order: 476214


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name: Theresa Austin****Date: 03 MAY 2019****Title: Group Leader**

Prep Logbook

Digestion for Soil

Batch ID: 1866819
Analyst: Andrew McKenzie (AXM6)
Method: Client Requested Procedure
Lab SOP: GL-RAD-A-015 REV# 18
Instrument: R2-38110047

Due Dates for Lab: 17-APR-2019 **Hold:** 24-SEP-2018 **Package:** 07-MAY-2019 **SDG:** 09-MA

Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1	476212001	12-APR-2019		0.5693	100	175.65431
2	476214001	12-APR-2019		0.4171	100	239.75066

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

This page intentionally left blank

CPC – Chemical Process Cell

This page intentionally left blank



February 08, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 469209
SDG: 429-433-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 17, 2019. 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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

February 8, 2019

Release Number

429

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.01

WV01.C2.06.01.04.10.01

WV01.C2.06.01.04.10.01

WV01.C2.06.01.04.10.01

WV01.C2.06.01.04.10.01

Description

CPC Floor 1

CPC Floor 2

CPC Floor 3

CPC Floor 4

CPC Floor 5

General Narrative

**Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 429-433-003169
Work Order: 469209**

February 08, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

429

Charge Number

WV01.C2.06.01.04.10.01

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on January 17, 2019 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.

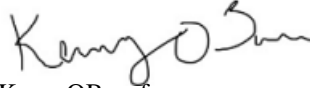
Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5

WD:2020:0753 - Attachment B

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

469209

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL 2. Charge #: WV01.02.06.01.04.10.01 3. Analysis Requested: Sr-90

5. PO #: CH-003169 6. Release #: 429 thru 433

8. Cognizant Engineer/Project: MPPB Demo

10. DQO/SAP#: WVDP-584

Sample ID#	Type	# Cont.	Pres.	Date	Time	pH
<u>CPC floor</u>	<u>Grab</u>	<u>1</u>	<u>na</u>	<u>8.7.18</u>	<u>1500</u>	<u>na</u>

11. Report Data To: W. Connors

4. Electronic Disk? Yes [] No [x]

7. Report Format Level: I [x] II []

9. Priority Code: Routine [x]

11. Report Data To: W. Connors

Comments: ** The five smears are to be composited by the lab to form a composite sample and analyzed for ²⁴¹Am, ¹³⁷Cs, ²³²U, ²³³U, ²³⁴U, ²³⁵U, ²³⁸U, ²³⁹Pu, ²⁴⁰Pu, ²⁴²Pu, ⁹⁰Sr. Report units in uCi per composite sample.

14. Phase (Circle one): Solid Liquid Sludge Other: _____

Type (Circle one): Smear Debris Coupon Pipe Section Filter Particulate Other: _____

15. Sample Bottle Size: 1 L Sample Bottle Type (Circle One): Glass

16. 10 mCi Alpha NA []

20. Sample Receipt: Temperature _____ °C
Cooler Seals Intact? Yes [] No []

17. Chain-of-Custody Reviewed by: [Signature]

19. Sample Custodian Signature/Date/Time: [Signature] 8.7.18

Released by: [Signature] 8.7.18 Received by: [Signature] 8.7.18

Released by: [Signature] 8.7.18 Received by: [Signature] 8.7.18

Released by: [Signature] 8.7.18 Received by: [Signature] 8.7.18

Released by: _____ Received by: _____



SAMPLE RECEIPT & REVIEW FORM

Client: WVNS SDG/AR/COC/Work Order: 469209

Received By: ZKW/RSO Date Received: 1/17/19

Carrier and Tracking Number: 8107 1470 9895
Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other

Suspected Hazard Information Yes No *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

A) Shipped as a DOT Hazardous? Hazard Class Shipped: _____ UN#: 2910
If UN2910, Is the Radioactive Shipment Survey Compliant? Yes No _____

B) Did the client designate the samples are to be received as radioactive? COC notation or radioactive stickers on containers equal client designation.

C) Did the RSO classify the samples as radioactive? Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 100CPM (mR/Hr)
Classified as: Rad 1 Rad 2 Rad 3

D) Did the client designate samples are hazardous? COC notation or hazard labels on containers equal client designation.

E) Did the RSO identify possible hazards? If D or E is yes, select Hazards below.
PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____

Sample Receipt Criteria Yes NA No

1 Shipping containers received intact and sealed? Comments/Qualifiers (Required for Non-Conforming Items)
Circle Applicable: Seals broken Damaged container Leaking container Other (describe)

2 Chain of custody documents included with shipment? Circle Applicable: Client contacted and provided COC COC created upon receipt

3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?* Preservation Method: Wet Ice Ice Packs Dry ice None Other: _____
*all temperatures are recorded in Celsius

4 Daily check performed and passed on IR temperature gun? Temperature Device Serial #: IR3-18 TEMP: 21c
Secondary Temperature Device Serial # (If Applicable): _____

5 Sample containers intact and sealed? Circle Applicable: Seals broken Damaged container Leaking container Other (describe)

6 Samples requiring chemical preservation at proper pH? Sample ID's and Containers Affected: _____
If Preservation added, Lot#: _____

7 Do any samples require Volatile Analysis? If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___
Sample ID's and containers affected: _____

8 Samples received within holding time? ID's and tests affected: _____

9 Sample ID's on COC match ID's on bottles? ID's and containers affected: _____

10 Date & time on COC match date & time on bottles? Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)

11 Number of containers received match number indicated on COC? Circle Applicable: No container count on COC Other (describe)

12 Are sample containers identifiable as GEL provided?

13 COC form is properly signed in relinquished/received sections? Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AM Date 1/18/19 Page 1 of 1

Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: February 8, 2019

Client Sample ID: CPC Floor 1
 Sample ID: 469209001
 Matrix: Swipe
 Collect Date: 07-FEB-18
 Receive Date: 17-JAN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00202	+/-0.000235	4.64E-05	+/-0.000384	2.00E-06	uCi/sample			AXM6	02/02/19	1027	1844224	1
Plutonium-239/240	Hh	0.00222	+/-0.000245	5.41E-05	+/-0.000414	2.00E-06	uCi/sample							
Plutonium-242	Hh	9.32E-05	+/-5.75E-05	6.24E-05	+/-5.92E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	3.67E-05	+/-4.35E-05	6.36E-05	+/-4.40E-05	2.00E-06	uCi/sample			AXM6	02/02/19	0940	1844223	2
Uranium-233/234	Hh	0.0001	+/-5.18E-05	3.79E-05	+/-5.46E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	9.47E-06	+/-2.17E-05	3.45E-05	+/-2.18E-05	2.00E-06	uCi/sample							
Uranium-238	HUh	2.19E-05	+/-2.77E-05	3.44E-05	+/-2.79E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.0194	+/-0.000327	4.60E-05	+/-0.00515	2.00E-06	uCi/sample			AXM6	02/02/19	1411	1844226	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.00919	+/-0.000843	0.000838	+/-0.0015		uCi/sample			AXM6	01/23/19	0955	1840729	4
Cesium-137	Hh	0.852	+/-0.00247	0.00036	+/-0.0726	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.000123	+/-9.20E-05	5.77E-05	+/-9.27E-05		uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	01/29/19	1004	1840728

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1844224	83.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	93.6	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	79.2	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1844226	92.7	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 1

Sample ID: 469209001

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 2
 Sample ID: 469209002
 Matrix: Swipe
 Collect Date: 07-FEB-18
 Receive Date: 17-JAN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00161	+/-0.00024	4.44E-05	+/-0.000359	2.00E-06	uCi/sample			AXM6	02/02/19	1027	1844224	1
Plutonium-239/240	Hh	0.00186	+/-0.000257	6.05E-05	+/-0.000401	2.00E-06	uCi/sample							
Plutonium-242	Hh	0.00011	+/-6.80E-05	6.05E-05	+/-7.04E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	Hh	9.62E-05	+/-5.96E-05	7.60E-05	+/-6.21E-05	2.00E-06	uCi/sample			AXM6	02/02/19	0940	1844223	2
Uranium-233/234	Hh	0.000154	+/-7.62E-05	5.39E-05	+/-8.11E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	9.20E-06	+/-3.15E-05	5.83E-05	+/-3.15E-05	2.00E-06	uCi/sample							
Uranium-238	HUh	-1.27E-05	+/-2.05E-05	6.53E-05	+/-2.05E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.00749	+/-0.000204	4.74E-05	+/-0.002	2.00E-06	uCi/sample			AXM6	02/02/19	1411	1844226	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.00489	+/-0.000538	0.000343	+/-0.000852		uCi/sample			AXM6	01/23/19	1217	1840729	4
Cesium-137	Hh	0.117	+/-0.000916	0.000149	+/-0.010	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.000395	+/-7.28E-05	4.70E-05	+/-8.09E-05		uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	01/29/19	1004	1840728

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1844224	73.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	83.1	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	104	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1844226	92.7	(25%-125%)

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 2

Sample ID: 469209002

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 3
 Sample ID: 469209003
 Matrix: Swipe
 Collect Date: 07-FEB-18
 Receive Date: 17-JAN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00341	+/-0.000329	5.76E-05	+/-0.000634	2.00E-06	uCi/sample			AXM6	02/02/19	1027	1844224	1
Plutonium-239/240	Hh	0.00407	+/-0.000359	7.92E-05	+/-0.000741	2.00E-06	uCi/sample							
Plutonium-242	Hh	0.000161	+/-7.55E-05	5.71E-05	+/-7.97E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	8.49E-05	+/-6.59E-05	9.24E-05	+/-6.75E-05	2.00E-06	uCi/sample			AXM6	02/02/19	0940	1844223	2
Uranium-233/234	HUh	4.59E-05	+/-4.53E-05	6.03E-05	+/-4.60E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	2.85E-05	+/-3.70E-05	5.25E-05	+/-3.73E-05	2.00E-06	uCi/sample							
Uranium-238	HUh	1.16E-05	+/-3.07E-05	5.52E-05	+/-3.08E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.0171	+/-0.000312	4.85E-05	+/-0.00452	2.00E-06	uCi/sample			AXM6	02/02/19	1411	1844226	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.0142	+/-0.000983	0.000717	+/-0.00215		uCi/sample			AXM6	01/23/19	1431	1840729	4
Cesium-137	Hh	0.614	+/-0.0021	0.000307	+/-0.0523	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.000465	+/-8.21E-05	5.16E-05	+/-9.21E-05		uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	01/29/19	1004	1840728

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1844224	68.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	96.1	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	84.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1844226	92.7	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 3

Sample ID: 469209003

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 4
 Sample ID: 469209004
 Matrix: Swipe
 Collect Date: 07-FEB-18
 Receive Date: 17-JAN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00499	+/-0.00041	6.76E-05	+/-0.00091	2.00E-06	uCi/sample			AXM6	02/02/19	1027	1844224	1
Plutonium-239/240	Hh	0.00536	+/-0.000424	8.41E-05	+/-0.00097	2.00E-06	uCi/sample							
Plutonium-242	Hh	9.13E-05	+/-6.20E-05	6.39E-05	+/-6.38E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	4.24E-05	+/-5.46E-05	8.90E-05	+/-5.51E-05	2.00E-06	uCi/sample			AXM6	02/02/19	0940	1844223	2
Uranium-233/234	Hh	0.000114	+/-6.01E-05	5.90E-05	+/-6.32E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	3.17E-05	+/-3.51E-05	4.64E-05	+/-3.55E-05	2.00E-06	uCi/sample							
Uranium-238	HUh	3.01E-05	+/-3.51E-05	4.87E-05	+/-3.55E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.031	+/-0.000425	4.67E-05	+/-0.00826	2.00E-06	uCi/sample			AXM6	02/02/19	1412	1844226	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.0169	+/-0.00193	0.00214	+/-0.00299		uCi/sample			AXM6	01/22/19	1544	1840729	4
Cesium-137	Hh	12.5	+/-0.00657	0.00111	+/-1.06	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.000517	+/-0.000132	0.00013	+/-0.00014		uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	01/29/19	1004	1840728

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1844224	80.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	99.3	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	90.3	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1844226	90.4	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 4

Sample ID: 469209004

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 5
 Sample ID: 469209005
 Matrix: Swipe
 Collect Date: 07-FEB-18
 Receive Date: 17-JAN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00991	+/-0.00118	0.000305	+/-0.00211	2.00E-06	uCi/sample			AXM6	02/02/19	1027	1844224	1
Plutonium-239/240	Hh	0.0121	+/-0.00131	0.00039	+/-0.00251	2.00E-06	uCi/sample							
Plutonium-242	HUh	0.000444	+/-0.000338	0.000474	+/-0.000347	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	0.000204	+/-0.000176	0.000249	+/-0.000179	2.00E-06	uCi/sample			AXM6	02/02/19	0940	1844223	2
Uranium-233/234	HUh	0.000118	+/-0.000145	0.000218	+/-0.000147	2.00E-06	uCi/sample							
Uranium-235/236	HUh	0.000102	+/-0.000124	0.000166	+/-0.000125	2.00E-06	uCi/sample							
Uranium-238	HUh	0.000142	+/-0.000162	0.000244	+/-0.000164	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.0328	+/-0.000425	5.08E-05	+/-0.00867	2.00E-06	uCi/sample			AXM6	02/02/19	1412	1844226	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.0471	+/-0.00173	0.00135	+/-0.00658		uCi/sample			AXM6	01/24/19	0553	1840729	4
Cesium-137	Hh	2.28	+/-0.00407	0.000602	+/-0.194	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.00258	+/-0.000199	7.21E-05	+/-0.000305		uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	01/29/19	1004	1840728

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1844224	54	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	76.5	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1844223	84.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1844226	92.7	(25%-125%)

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 8, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: CPC Floor 5

Sample ID: 469209005

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 8, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 469209

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1840729										
QC1204199764	LCS										
Cobalt-60	0.00719			0.00735	uCi/sample		102	(75%-125%)	AXM6	01/24/19	09:41
Americium-241	0.0295			0.028	uCi/sample		94.7	(75%-125%)			
Cesium-137	0.0103			0.0102	uCi/sample		99.3	(75%-125%)			
QC1204199765	LCSD										
Cobalt-60	0.00719			0.00757	uCi/sample	2.94	105	(0%-20%)		01/24/19	10:12
Americium-241	0.0295			0.0279	uCi/sample	0.43	94.3	(0%-20%)			
Cesium-137	0.0103			0.0104	uCi/sample	1.94	101	(0%-20%)			
QC1204199763	MB										
Cobalt-60			U	-3.48E-05	uCi/sample					01/24/19	07:57
Americium-241			U	-1.47E-06	uCi/sample						
Cesium-137			U	-3.60E-05	uCi/sample						
Batch	1844223										
QC1204207769	LCS										
Uranium-232			U	-3.91E-05	uCi/sample			(75%-125%)	AXM6	02/02/19	09:40
Uranium-233/234				0.00237	uCi/sample						
Uranium-235/236				0.00013	uCi/sample						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 469209

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1844223										
Uranium-238	0.00273			0.00276	uCi/sample		101	(75%-125%)	AXM6	02/02/19	09:40
QC1204207770	LCSD										
Uranium-232			U	-1.42E-05	uCi/sample	0		(0%-20%)		02/02/19	09:40
Uranium-233/234				0.0028	uCi/sample	16.5					
Uranium-235/236				0.000152	uCi/sample	16					
Uranium-238	0.00273			0.0029	uCi/sample	4.93	106	(0%-20%)			
QC1204207768	MB										
Uranium-232			U	2.41E-05	uCi/sample					02/02/19	09:40
Uranium-233/234			U	3.12E-05	uCi/sample						
Uranium-235/236			U	1.04E-05	uCi/sample						
Uranium-238			U	8.15E-06	uCi/sample						
Batch	1844224										
QC1204207772	LCS										
Plutonium-238				5.67E-05	uCi/sample				AXM6	02/02/19	10:27
Plutonium-239/240	0.002			0.00201	uCi/sample		100	(75%-125%)			
Plutonium-242			U	2.79E-05	uCi/sample			(75%-125%)			
QC1204207773	LCSD										
Plutonium-238				9.45E-05	uCi/sample	50				02/02/19	10:27
Plutonium-239/240	0.002			0.00193	uCi/sample	4.31	96.1	(0%-20%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 469209

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1844224										
Plutonium-242				0.000137	uCi/sample	85			AXM6	02/02/19	10:27
QC1204207771	MB										
Plutonium-238			U	3.65E-05	uCi/sample					02/02/19	10:27
Plutonium-239/240			U	1.26E-05	uCi/sample						
Plutonium-242			U	1.76E-05	uCi/sample						
Batch	1844226										
QC1204207775	LCS										
Strontium-90				0.00232							
				0.00233	uCi/sample		101	(75%-125%)	AXM6	02/02/19	14:12
QC1204207776	LCSD										
Strontium-90				0.00232		0.39	101	(0%-20%)		02/02/19	14:12
				0.00234	uCi/sample						
QC1204207774	MB										
Strontium-90			U	1.70E-05	uCi/sample					02/02/19	14:12

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 469209

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N1											
ND											
NJ											
Q											
R											
U											
UI											
UJ											
UL											
X											
Y											
^											
h											

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.

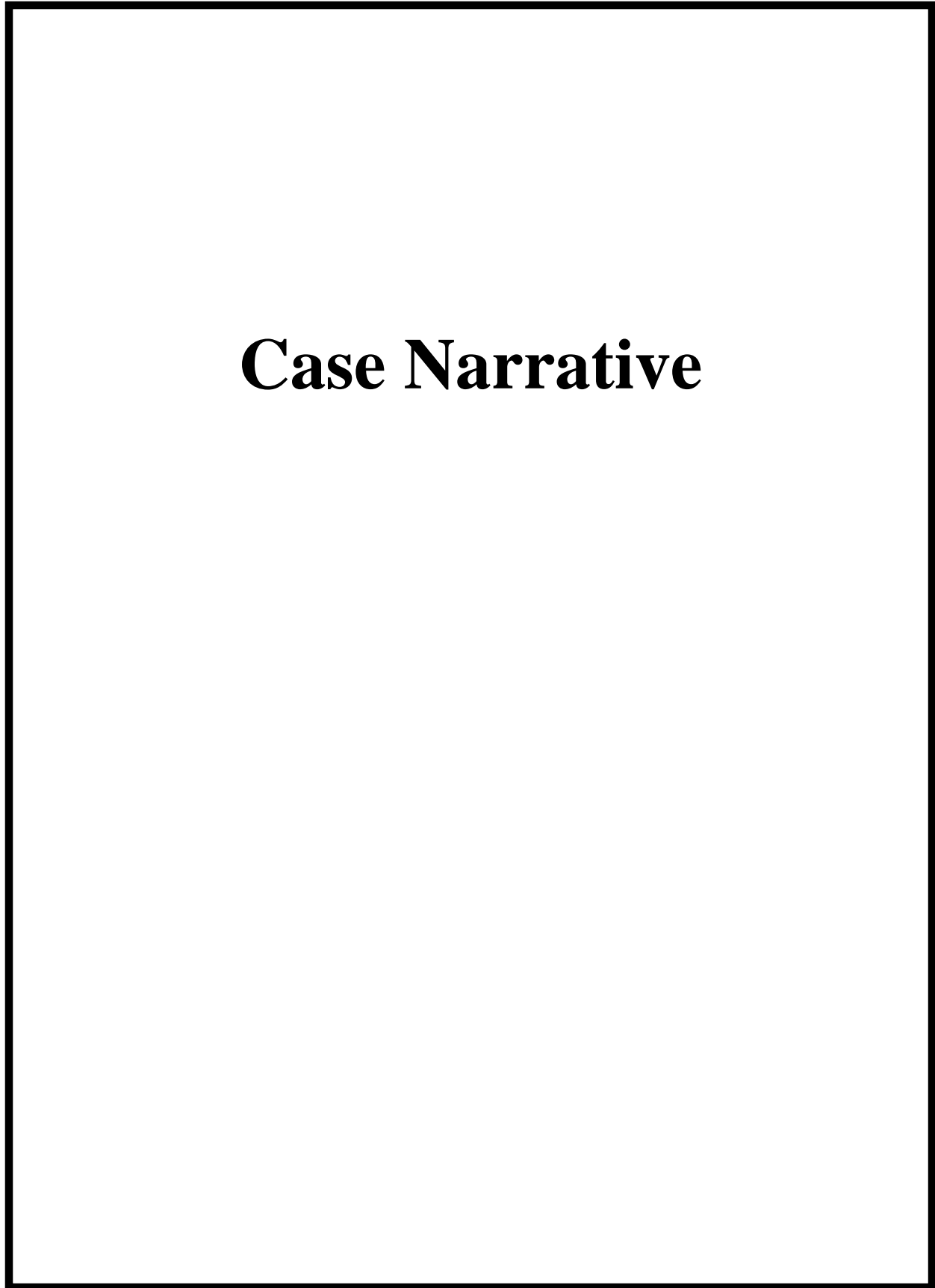
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 08 February 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-1
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 429-433-003169
Work Order #: 469209

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1844223

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1840728

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5
1204207768	Method Blank (MB)
1204207769	Laboratory Control Sample (LCS)
1204207770	Laboratory Control Sample Duplicate (LCSD)

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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204207768 (MB)	Uranium-232	Result 0.0000241 < MDA 0.0000722 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.0000312 < MDA 0.0000657 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000104 < MDA 0.0000609 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.00000815 < MDA 0.0000517 > RDL 0.000002 uCi/sample

The following detection limits were not achieved due to high sample activity.

WD:2020:0753 - Attachment B

Sample	Analyte	Value
469209001 (CPC Floor 1)	Uranium-232	Result 0.0000367 < MDA 0.0000636 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.00000947 < MDA 0.0000345 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000219 < MDA 0.0000344 > RDL 0.000002 uCi/sample
469209002 (CPC Floor 2)	Uranium-235/236	Result 0.0000092 < MDA 0.0000583 > RDL 0.000002 uCi/sample
	Uranium-238	Result -0.0000127 < MDA 0.0000653 > RDL 0.000002 uCi/sample
469209003 (CPC Floor 3)	Uranium-232	Result 0.0000849 < MDA 0.0000924 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.0000459 < MDA 0.0000603 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000285 < MDA 0.0000525 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000116 < MDA 0.0000552 > RDL 0.000002 uCi/sample
469209004 (CPC Floor 4)	Uranium-232	Result 0.0000424 < MDA 0.000089 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000317 < MDA 0.0000464 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000301 < MDA 0.0000487 > RDL 0.000002 uCi/sample
469209005 (CPC Floor 5)	Uranium-232	Result 0.000204 < MDA 0.000249 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.000118 < MDA 0.000218 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.000102 < MDA 0.000166 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.000142 < MDA 0.000244 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
469209001 (CPC Floor 1)	Received 17-JAN-19, out of holding 06-AUG-18
469209002 (CPC Floor 2)	Received 17-JAN-19, out of holding 06-AUG-18
469209003 (CPC Floor 3)	Received 17-JAN-19, out of holding 06-AUG-18
469209004 (CPC Floor 4)	Received 17-JAN-19, out of holding 06-AUG-18
469209005 (CPC Floor 5)	Received 17-JAN-19, out of holding 06-AUG-18

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD**Analytical Method:** DOE EML HASL-300, Pu-11-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1844224**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1840728

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5
1204207771	Method Blank (MB)
1204207772	Laboratory Control Sample (LCS)
1204207773	Laboratory Control Sample Duplicate (LCSD)

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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204207771 (MB)	Plutonium-238	Result 0.0000365 < MDA 0.0000442 > RDL 0.000002 uCi/sample
	Plutonium-239/240	Result 0.0000126 < MDA 0.0000189 > RDL 0.000002 uCi/sample

Sample (See Below) did not meet the detection limit due to the small sample aliquot used. The aliquot was reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
469209005 (CPC Floor 5)	Plutonium-242	Result 0.000444 < MDA 0.000474 > RDL 0.0002 uCi/sample

WD:2020:0753 - Attachment B

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
469209001 (CPC Floor 1)	Received 17-JAN-19, out of holding 06-AUG-18
469209002 (CPC Floor 2)	Received 17-JAN-19, out of holding 06-AUG-18
469209003 (CPC Floor 3)	Received 17-JAN-19, out of holding 06-AUG-18
469209004 (CPC Floor 4)	Received 17-JAN-19, out of holding 06-AUG-18
469209005 (CPC Floor 5)	Received 17-JAN-19, out of holding 06-AUG-18

Miscellaneous Information**Additional Comments**

Sample 1204207772 (LCS) did not meet the resolution requirement of having a full width half maximum of 100 keV or less for the tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1840728

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5

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**Holding Time**

Samples were received and analyzed outside the hold time.

WD:2020:0753 - Attachment B

Product: Gammaspec, Gamma, Cs137, Filter HIGH RAD**Analytical Method:** DOE HASL 300, 4.5.2.3/Ga-01-R**Analytical Procedure:** GL-RAD-A-013 REV# 27**Analytical Batch:** 1840729**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1840728

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5
1204199763	Method Blank (MB)
1204199764	Laboratory Control Sample (LCS)
1204199765	Laboratory Control Sample Duplicate (LCSD)

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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204199763 (MB)	Cesium-137	Result -0.000036 < MDA 0.0000548 > RDL 0.0000002 uCi/sample

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
469209001 (CPC Floor 1)	Received 17-JAN-19, out of holding 06-AUG-18
469209002 (CPC Floor 2)	Received 17-JAN-19, out of holding 06-AUG-18
469209003 (CPC Floor 3)	Received 17-JAN-19, out of holding 06-AUG-18
469209004 (CPC Floor 4)	Received 17-JAN-19, out of holding 06-AUG-18

WD:2020:0753 - Attachment B

469209005 (CPC Floor 5) Received 17-JAN-19, out of holding 06-AUG-18

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	469209001	CPC Floor 1
	469209002	CPC Floor 2
	469209003	CPC Floor 3
	469209004	CPC Floor 4
	469209005	CPC Floor 5

Product: GFPC, Sr90, filter HIGH RAD**Analytical Method:** EPA 905.0 Modified/DOE RP501 Rev. 1 Modified**Analytical Procedure:** GL-RAD-A-004 REV# 20**Analytical Batch:** 1844226**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1840728

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
469209001	CPC Floor 1
469209002	CPC Floor 2
469209003	CPC Floor 3
469209004	CPC Floor 4
469209005	CPC Floor 5
1204207774	Method Blank (MB)
1204207775	Laboratory Control Sample (LCS)
1204207776	Laboratory Control Sample Duplicate (LCSD)

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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

WD:2020:0753 - Attachment B

Sample	Analyte	Value
1204207774 (MB)	Strontium-90	Result 0.000017 < MDA 0.0000414 > RDL 0.000002 uCi/sample

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
469209001 (CPC Floor 1)	Received 17-JAN-19, out of holding 06-AUG-18
469209002 (CPC Floor 2)	Received 17-JAN-19, out of holding 06-AUG-18
469209003 (CPC Floor 3)	Received 17-JAN-19, out of holding 06-AUG-18
469209004 (CPC Floor 4)	Received 17-JAN-19, out of holding 06-AUG-18
469209005 (CPC Floor 5)	Received 17-JAN-19, out of holding 06-AUG-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 429-433-003169 GEL Work Order: 469209

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

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: Spencer Collins****Date: 05 FEB 2019****Title: Analyst I**

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1840728
Analyst: Andrew McKenzie (AXM6)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 10-FEB-2019 **Hold: 06-AUG-2018** **Package: 12-FEB-2019** **SDG: 14-FEB**
 Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	469209001	29-JAN-2019		1	0	0.6632	0.6632	100	0.6632	0.6632
2	469209002	29-JAN-2019		1	0	1.0624	1.0624	100	1.0624	1.0624
3	469209003	29-JAN-2019		1	0	1.1219	1.1219	100	1.1219	1.1219
4	469209004	29-JAN-2019		1	0	1.1205	1.1205	100	1.1205	1.1205
5	469209005	29-JAN-2019		1	0	1.0603	1.0603	100	1.0603	1.0603

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

GCRE – General Purpose Cell Crane Room Extension

This page intentionally left blank



December 05, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 495554
SDG: 479-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 07, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

December 5, 2019

Release Number

479

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.02

Description

GCR Floor Smear Sample

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 479-003169
Work Order: 495554

December 05, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

479

Charge Number

WV01.C2.06.01.04.10.02

Summary

Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on November 07, 2019 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.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
495554001	GCR Floor Smear Sample

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

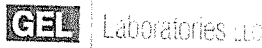
Chain of Custody and Supporting Documentation

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

495554

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL	2. Charge #: WV01.C2.06.01.04.10.02	3. Analysis Requested		4. Electronic Disk? Yes [] No [X]
5. PO #: CH-003169	6. Release #: 479			7. Report Format Level: I [X] II []
8. Cognizant Engineer/Project: FDP				9. Priority Code: Routine [X]
10. DQO/SAP#: WVDP-584				11. Report Data To: W. Connors
12.				1 [] 2 [] 3 []
Sample ID#	Type	# Cont.	Pres.	Date
GCR Floor Smear Sample	Grab	1	none	5.30.19
				Time
				10:00
				pH
				n/a
				* rad isotopes
				X
* Am-241, Cs-137, Pu-238, Pu-239, Pu-240, Pu-241, Sr-90, U-232, U-233, U-234, U-235, U-238				
18. Gross Wt (g)	140.3		14. Phase (Circle one): Solid	Liquid Sludge Other:
Tare Wt (g)	104		Type (Circle one): Debris	Coupon Pipe Section Filter Particulate Other: Smears
Net Wt (g)	36.3		15. Sample Bottle Size: ml 1000	Sample Bottle Type (Circle One): Glass (Poly)
17. Chain-of-Custody Reviewed by: <i>James Wheeler</i>				
19. Sample Custodian Signature/Date/Time				
Released by: <i>ALL</i>	5.30.19	1515	Received by: <i>James Wheeler</i>	5.30.19 1515
Released by: <i>James Wheeler</i>	5.6.19	14:27	Received by: <i>J</i>	11/7/19 850
Released by:			Received by:	
Released by:			Received by:	
		20. Sample Receipt:		Temperature 22 °C
		16. <10 mCi Alpha NA []		Cooler Seals Intact? Yes [X] No []



SAMPLE RECEIPT & REVIEW FORM

Client: WVNS SDG/AR/COC/Work Order: 495554
 Received By: [Signature] Date Received: 11/7/19

Carrier and Tracking Number

Circle Applicable:
 FedEx Express FedEx Ground UPS Field Services Courier Other

810714709601

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: _____ UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples to be received as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0.3</u> CPM <input checked="" type="radio"/> mR/Hr Classified as: Rad 1 <input checked="" type="checkbox"/> Rad 2 <input type="checkbox"/> Rad 3 <input type="checkbox"/>
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If D or E is yes, select Hazards below. PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other: _____

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Seals broken <input type="checkbox"/> Damaged container <input type="checkbox"/> Leaking container <input type="checkbox"/> Other (describe) _____
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC <input type="checkbox"/> COC created upon receipt <input type="checkbox"/>
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/>		<input checked="" type="checkbox"/>	Preservation Method: Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry ice <input checked="" type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>22°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Temperature Device Serial #: <u>JR2-19</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Seals broken <input type="checkbox"/> Damaged container <input type="checkbox"/> Leaking container <input type="checkbox"/> Other (describe) _____
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: _____
7	Do any samples require Volatile Analysis?	<input type="checkbox"/>		<input type="checkbox"/>	If Preservation added, Lot#: _____
		<input type="checkbox"/>		<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> (If yes, take to VOA Freezer)
		<input checked="" type="checkbox"/>		<input type="checkbox"/>	Do liquid VOA vials contain acid preservation? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> (If unknown, select No) Are liquid VOA vials free of headspace? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> Sample ID's and containers affected: _____
8	Samples received within holding time?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	ID's and tests affected: _____
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	ID's and containers affected: _____
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: No dates on containers <input type="checkbox"/> No times on containers <input type="checkbox"/> COC missing info <input type="checkbox"/> Other (describe) _____
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: No container count on COC <input type="checkbox"/> Other (describe) _____
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Not relinquished <input type="checkbox"/> Other (describe) _____

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials uo Date 11/8 Page 1 of 1

Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: December 5, 2019

Client Sample ID: GCR Floor Smear Sample
 Sample ID: 495554001
 Matrix: Swipe
 Collect Date: 30-MAY-19
 Receive Date: 07-NOV-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Am241, Cm243 and 244 HIGH RAD "As Received"</i>														
Americium-241	H	0.0187	+/-0.000638	7.32E-05	+/-0.00271	0.0002	uCi/sample			AXM6	12/04/19	1012	1944059	1
Curium-243/244	H	0.000276	+/-7.85E-05	2.71E-05	+/-8.75E-05	2.00E-06	uCi/sample							
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	H	0.0072	+/-0.000364	4.17E-05	+/-0.00112	2.00E-06	uCi/sample			AXM6	12/04/19	1404	1944056	2
Plutonium-239/240	H	0.00844	+/-0.000393	3.35E-05	+/-0.00131	2.00E-06	uCi/sample							
Plutonium-242	HU	2.36E-05	+/-3.05E-05	4.76E-05	+/-3.07E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	H	0.000148	+/-7.53E-05	6.93E-05	+/-7.96E-05	2.00E-06	uCi/sample			AXM6	12/04/19	0821	1944054	3
Uranium-233/234	H	0.000122	+/-5.49E-05	3.84E-05	+/-5.90E-05	2.00E-06	uCi/sample							
Uranium-235/236	HU	8.88E-06	+/-2.04E-05	3.24E-05	+/-2.05E-05	2.00E-06	uCi/sample							
Uranium-238	HU	1.33E-05	+/-2.35E-05	3.56E-05	+/-2.36E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	H	0.757	+/-0.00266	2.47E-05	+/-0.199	2.00E-06	uCi/sample			AXM6	12/04/19	0749	1944061	4
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241		0.0297	+/-0.0013	0.000891	+/-0.00432		uCi/sample			JXB7	11/25/19	1121	1942907	5
Cesium-137		0.304	+/-0.00116	0.000143	+/-0.0298	2.00E-07	uCi/sample							
Cobalt-60		0.000106	+/-3.98E-05	3.41E-05	+/-4.12E-05		uCi/sample							
Europium-154		0.000405	+/-0.000137	7.68E-05	+/-0.000142		uCi/sample							
<i>Liquid Scint Pu241, Filter "As Received"</i>														
Plutonium-241	H	0.0682	+/-0.0087	0.0103	+/-0.0174	25.0	uCi/sample			AXM6	12/04/19	1832	1944060	6

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	11/26/19	1406	1942902

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	DOE HASL 300, 4.5.2.3/Ga-01-R
6	DOE EML HASL-300, Pu-11-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241, Cm243 and 244 HIGH RAD "As Received"	1944059	108	(15%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste
 Client Sample ID: GCR Floor Smear Sample
 Sample ID: 495554001

Report Date: December 5, 2019

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test					Batch ID	Recovery%	Acceptable Limits				
Plutonium-236 Tracer		Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"					1944056	68.4	(15%-125%)				
Uranium-232 Tracer		Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"					1944054	95.9	(15%-125%)				
Uranium-235/236 Tracer		Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"					1944054	82.2	(15%-125%)				
Strontium Carrier		GFPC, Sr90, filter HIGH RAD "As Received"					1944061	79.1	(25%-125%)				
Plutonium-236 Tracer		Liquid Scint Pu241, Filter "As Received"					1944060	68.7	(15%-125%)				

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: December 5, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 495554

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1942907										
QC1204441587	495554001	DUP									
Cobalt-60		0.000106		0.000128	uCi/sample	18.4		(0% - 100%)	JXB7	11/25/19	13:28
Americium-241		0.0297		0.0282	uCi/sample	5.42		(0%-20%)			
Cesium-137		0.304		0.305	uCi/sample	0.493		(0%-20%)			
Europium-154		0.000405		0.00047	uCi/sample	14.9		(0%-20%)			
QC1204441588	LCS										
Cobalt-60	0.00644			0.00722	uCi/sample		112	(75%-125%)		11/25/19	18:18
Americium-241	0.0295			0.0324	uCi/sample		110	(75%-125%)			
Cesium-137	0.0101			0.0104	uCi/sample		103	(75%-125%)			
Europium-154			U	-8.94E-06	uCi/sample						
QC1204441586	MB										
Cobalt-60			U	-2.63E-05	uCi/sample					11/25/19	16:10
Americium-241			U	0.000117	uCi/sample						
Cesium-137			U	-1.30E-05	uCi/sample						
Europium-154			U	9.06E-06	uCi/sample						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 495554

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1944054										
QC1204444105	LCS										
Uranium-232			U	-3.14E-05	uCi/sample			(75%-125%)	AXM6	12/04/19	08:21
Uranium-233/234				0.0027	uCi/sample						
Uranium-235/236				0.000195	uCi/sample						
Uranium-238	0.00243			0.00268	uCi/sample		110	(75%-125%)			
QC1204444106	LCSD										
Uranium-232			U	5.46E-06	uCi/sample	0		(0%-20%)		12/04/19	08:21
Uranium-233/234				0.00226	uCi/sample	17.7					
Uranium-235/236				0.0001	uCi/sample	64					
Uranium-238	0.00243			0.00256	uCi/sample	4.61	105	(0%-20%)			
QC1204444104	MB										
Uranium-232			U	-9.21E-07	uCi/sample					12/04/19	08:21
Uranium-233/234			U	-7.69E-06	uCi/sample						
Uranium-235/236			U	-3.30E-06	uCi/sample						
Uranium-238			U	2.74E-07	uCi/sample						
Batch	1944056										
QC1204444108	LCS										
Plutonium-238			U	8.86E-06	uCi/sample				AXM6	12/04/19	09:04
Plutonium-239/240	0.00179			0.00159	uCi/sample		88.9	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 495554

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1944056										
Plutonium-242			U	2.35E-05	uCi/sample			(75%-125%)	AXM6	12/04/19	09:04
QC1204444109	LCSD										
Plutonium-238			U	3.23E-05	uCi/sample	0				12/04/19	14:04
Plutonium-239/240	0.00179			0.00189	uCi/sample	17	105	(0%-20%)			
Plutonium-242			U	-1.88E-05	uCi/sample	0					
QC1204444107	MB										
Plutonium-238			U	1.86E-05	uCi/sample					12/04/19	09:04
Plutonium-239/240			U	1.41E-05	uCi/sample						
Plutonium-242			U	1.00E-05	uCi/sample						
Batch	1944059										
QC1204444114	LCS										
Americium-241	0.00175			0.00196	uCi/sample		112	(75%-125%)	AXM6	12/04/19	09:04
Curium-243/244	0.00206			0.00207	uCi/sample		101	(75%-125%)			
QC1204444115	LCSD										
Americium-241	0.00175			0.00182	uCi/sample	7.49	104	(0%-20%)		12/04/19	09:04
Curium-243/244	0.00206			0.00206	uCi/sample	0.31	100	(0%-20%)			
QC1204444113	MB										
Americium-241				6.43E-05	uCi/sample					12/04/19	10:12
Curium-243/244			U	-2.09E-06	uCi/sample						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 495554

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1944060										
QC1204444117	LCS										
Plutonium-241	0.0737			0.0677	uCi/sample		91.9	(75%-125%)	AXM6	12/04/19	19:04
QC1204444118	LCSD										
Plutonium-241	0.0737			0.0771	uCi/sample	12.9	105	(0%-20%)		12/04/19	19:21
QC1204444116	MB										
Plutonium-241			U	0.00145	uCi/sample					12/04/19	18:48
Batch	1944061										
QC1204444120	LCS										
Strontium-90	0.00124			0.00149	uCi/sample		121	(75%-125%)	AXM6	12/04/19	07:49
QC1204444121	LCSD										
Strontium-90	0.00124			0.00145	uCi/sample	2.9	117	(0%-20%)		12/04/19	07:49
QC1204444119	MB										
Strontium-90				0.000199	uCi/sample					12/04/19	07:49

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J See case narrative for an explanation
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 495554

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N1											
ND											
NJ											
Q											
R											
U											
UI											
UJ											
UL											
X											
Y											
^											
h											

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.

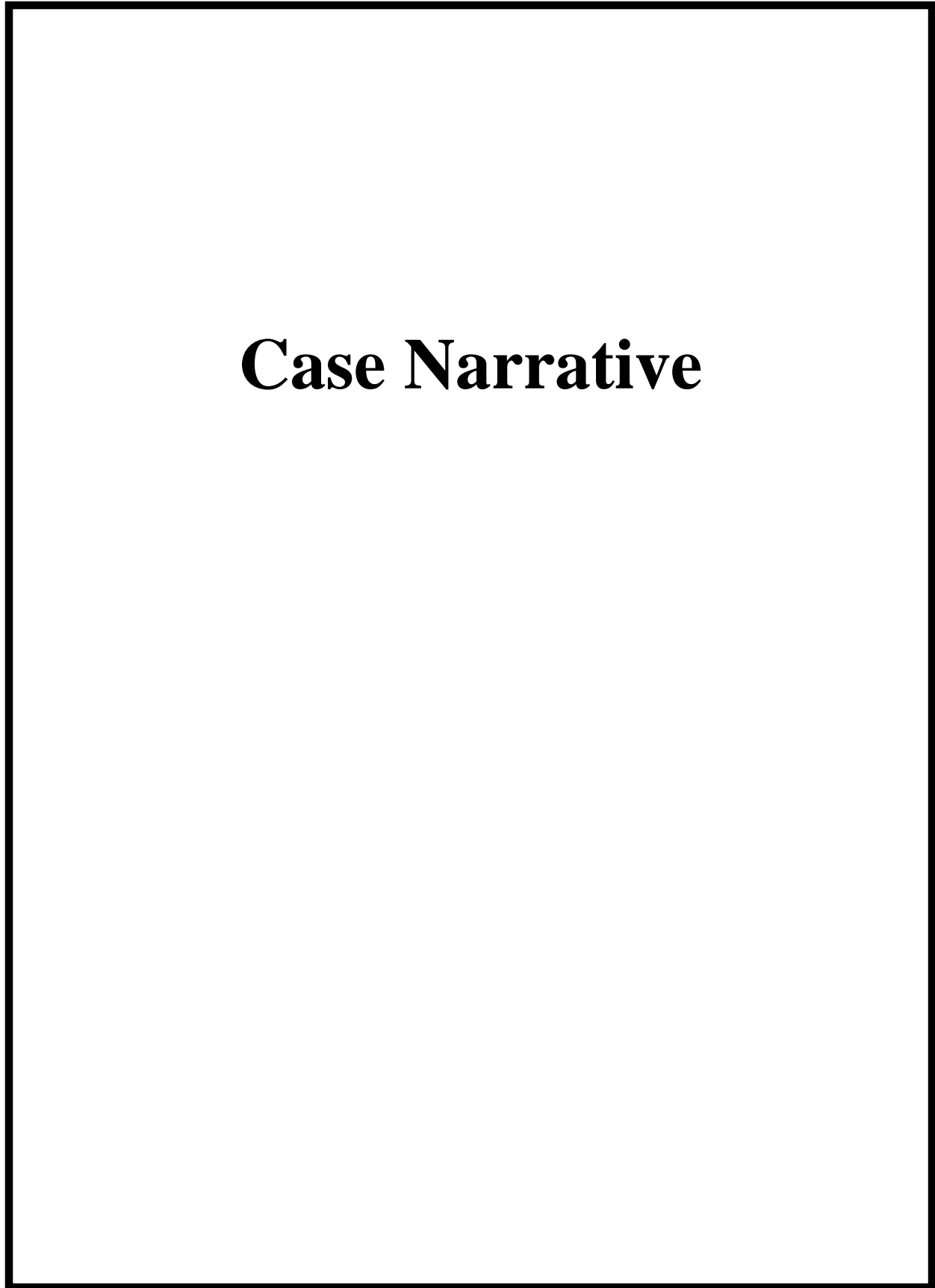
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 05 December 2019

State	Certification
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122020-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2019-165
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122019-29
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 479-003169
Work Order #: 495554

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1944054

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204444104	Method Blank (MB)
1204444105	Laboratory Control Sample (LCS)
1204444106	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Aliquot Reduced

aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204444104 (MB)	Uranium-232	Result -0.000000921 < MDA 0.0000727 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result -0.00000769 < MDA 0.0000328 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result -0.0000033 < MDA 0.000038 > RDL 0.000002 uCi/sample

WD:2020:0753 - Attachment B

	Uranium-238	Result 0.000000274 < MDA 0.0000451 > RDL 0.000002 uCi/sample
495554001 (GCR Floor Smear Sample)	Uranium-235/236	Result 0.00000888 < MDA 0.0000324 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000133 < MDA 0.0000356 > RDL 0.000002 uCi/sample

Sample (See Below) did not meet the detection limit due to the small sample aliquot used. The aliquot was reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
495554001 (GCR Floor Smear Sample)	Uranium-235/236	Result 0.00000888 < MDA 0.0000324 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000133 < MDA 0.0000356 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received with in the hold time, however, the analysis was performed outside the hold time.

Sample	Value
495554001 (GCR Floor Smear Sample)	Received 07-NOV-19, within holding, analyzed 04-DEC-19, out of holding 26-NOV-19

Recounts

The U-236 traced portion of sample 495554001 (GCR Floor Smear Sample) was recounted due to a peak shift. The recount is being reported.

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1944056

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204444107	Method Blank (MB)

WD:2020:0753 - Attachment B

1204444108 Laboratory Control Sample (LCS)
1204444109 Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Aliquot Reduced

aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204444107 (MB)	Plutonium-238	Result 0.0000186 < MDA 0.0000279 > RDL 0.000002 uCi/sample
	Plutonium-239/240	Result 0.0000141 < MDA 0.0000515 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received with in the hold time, however, the analysis was performed outside the hold time.

Sample	Value
495554001 (GCR Floor Smear Sample)	Received 07-NOV-19, within holding, analyzed 04-DEC-19, out of holding 26-NOV-19

Recounts

Sample 1204444109 (LCSD) was recounted due to high recovery. The recount is reported. Sample 495554001 (GCR Floor Smear Sample) was recounted due to a peak shift. The recount is reported.

Product: Alphaspec Am241, Cm243 and 244 HIGH RAD

Analytical Method: DOE EML HASL-300, Am-05-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1944059

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

WD:2020:0753 - Attachment B

Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204444113	Method Blank (MB)
1204444114	Laboratory Control Sample (LCS)
1204444115	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Aliquot Reduced

aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

Method Blank Criteria

The blank (See Below) activity is greater than the MDC but is less than five percent of the lowest activity in the batch.

Sample	Analyte	Value
1204444113 (MB)	Americium-241	Result: 6.43E-05 uCi/sample > MDA: 5.40E-05 uCi/sample <= RDL: 0.0002 uCi/sample

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204444113 (MB)	Curium-243/244	Result -0.00000209 < MDA 0.0000417 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received with in the hold time, however, the analysis was performed outside the hold time.

Sample	Value
495554001 (GCR Floor Smear Sample)	Received 07-NOV-19, within holding, analyzed 04-DEC-19, out of holding 26-NOV-19

WD:2020:0753 - Attachment B

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample

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: Gammascpec, Gamma, Cs137, Filter HIGH RAD
Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R
Analytical Procedure: GL-RAD-A-013 REV# 27
Analytical Batch: 1942907

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204441586	Method Blank (MB)
1204441587	495554001(GCR Floor Smear Sample) Sample Duplicate (DUP)
1204441588	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

RDL Met

WD:2020:0753 - Attachment B

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204441586 (MB)	Cesium-137	Result -0.000013 < MDA 0.0000406 > RDL 0.0000002 uCi/sample

Technical Information

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	495554001	GCR Floor Smear Sample
Europium-154	495554001	GCR Floor Smear Sample

Product: GFPC, Sr90, filter HIGH RAD

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1944061

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204444119	Method Blank (MB)
1204444120	Laboratory Control Sample (LCS)
1204444121	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Preparation Information

Performed additional column separation to minimize interference.

Quality Control (QC) Information

WD:2020:0753 - Attachment B

Method Blank Criteria

The blank (See Below) activity is greater than the MDC but is less than five percent of the lowest activity in the batch.

Sample	Analyte	Value
1204444119 (MB)	Strontium-90	Result: 0.000199 uCi/sample > MDA: 2.44E-05 uCi/sample > RDL: 2.00E-06 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received within the hold time, however, the analysis was performed outside the hold time.

Sample	Value
495554001 (GCR Floor Smear Sample)	Received 07-NOV-19, within holding, analyzed 04-DEC-19, out of holding 26-NOV-19

Product: Liquid Scint Pu241, Filter

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 21

Analytical Batch: 1944060

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1942902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
495554001	GCR Floor Smear Sample
1204444116	Method Blank (MB)
1204444117	Laboratory Control Sample (LCS)
1204444118	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Preparation Information

WD:2020:0753 - Attachment B

Performed second columns for removal of iron interferences.

Aliquot Reduced

aliquots were reduced due to high activity based on Gamma data.

Technical Information

Holding Time

Sample (See Below) was received with in the hold time, however, the analysis was performed outside the hold time.

Sample	Value
495554001 (GCR Floor Smear Sample)	Received 07-NOV-19, within holding, analyzed 04-DEC-19, out of holding 26-NOV-19

Miscellaneous Information

Manual Integration

Manual integrations of alpha spectroscopy spectra 1204444117 (LCS) and 495554001 (GCR Floor Smear Sample) were performed to fully separate counts in Regions of Interest which would have been biased.

Additional Comments

The tracer peak centroid for sample 495554001 (GCR Floor Smear Sample) is greater than 50 keV from the expected library energy value for the tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 479-003169 GEL Work Order: 495554


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

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

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

Signature: **Name:** Theresa Austin**Date:** 05 DEC 2019**Title:** Group Leader

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1942902
Analyst: Andrew McKenzie (AXM6)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 26-NOV-2019 **Hold: 26-NOV-2019** **Package: 04-DEC-2019** **SDG: 05-DE**
 Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	495554001	26-NOV-2019		1	0	3.7394	1.3934	100	3.7394	1.3934
2	497207001	26-NOV-2019		1	0	0.0628	0.0148	100	0.0628	0.0148

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

This page intentionally left blank

HEV – Head End Ventilation

This page intentionally left blank



February 25, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 470349
SDG: 436-437-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 01, 2019. 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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

February 25, 2019

Release Number

436

Purchase Order Number

CH-003169

Charge #

WV01.02.06.01.04.10.02

WV01.02.06.01.04.10.02

Description

HEV Floor North

HEV Floor South

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 436-437-003169
Work Order: 470349

February 25, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

436 and 437

Charge Number

WV01.02.06.01.04.10.02

Summary

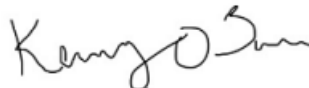
Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 01, 2019 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
470349001	HEV Floor North
470349002	HEV Floor South

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

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

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

470349

WD:2020-0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: <u>GEL</u>		2. Charge #: <u>WV01020601041002</u>		3. Analysis Requested		4. Electronic Disk? Yes [] No [x]	
5. PO #: <u>CH-003169</u>		6. Release #: <u>436 and 437</u>		U alpha isotopes (U-232, -233/234, 235/236, -238)		7. Report Format Level: I [x] II []	
8. Cognizant Engineer/Project: <u>MPPB Demo</u>		10. DQO/SAP#: <u>WVDP-584</u>		Gamma for Cs-137 & Am-241		9. Priority Code: Routine [x]	
12. Sample ID#		Type	# Cont.	Pres.	Date	Time	pH
<u>HEV Filter room floor</u>		<u>Grab</u>	<u>1</u>	<u>na</u>	<u>3-22-18</u>	<u>1000</u>	<u>na</u>
13. HEV Filter room floor		U alpha isotopes (Pu-238, -239/240, -242)		X		X	
14. Gross Wt (g)		Liquid		Sludge		Other:	
<u>116.6</u>		<u>Solid</u>					
15. Tare Wt (g)		Debris		Coupon		Pipe Section	
<u>105</u>						Filter	
16. Net Wt (g)		Particulate		Other: <u>Smear</u>			
<u>11.4</u>							
17. Chain-of-Custody Reviewed by: <u>Frankie</u>		Sample Bottle Size: <u>1000 ml</u>		Sample Bottle Type (Circle One): <u>Glass</u>		16. <u>410</u> mCi Alpha NA []	
18. Released by: <u>TJW 3-22-18</u>		Received by: <u>Frankie</u>		Signature/Date/Time		20. Sample Receipt:	
Released by: <u>WJG</u>		Received by: <u>2/1/19</u>		Temperature _____ °C		Cooler Seals Intact? Yes [] No []	
Released by: <u>WJG</u>		Received by: <u>2/1/19</u>					
Released by: <u>WJG</u>		Received by: <u>2/1/19</u>					

Comments
** The five smears are to be composited by the lab to form a composite sample and analyzed for ²⁴¹Am, ¹³⁷Cs, ²³²U, ²³³U, ²³⁴U, ²³⁵U, ²³⁶U, ²³⁸U, ²³⁹Pu, ²⁴⁰Pu, ²⁴²Pu, ⁹⁰Sr, Report units in uCi per composite sample.

Analyze each smear individually for all parameters 2/12/19



SAMPLE RECEIPT & REVIEW FORM

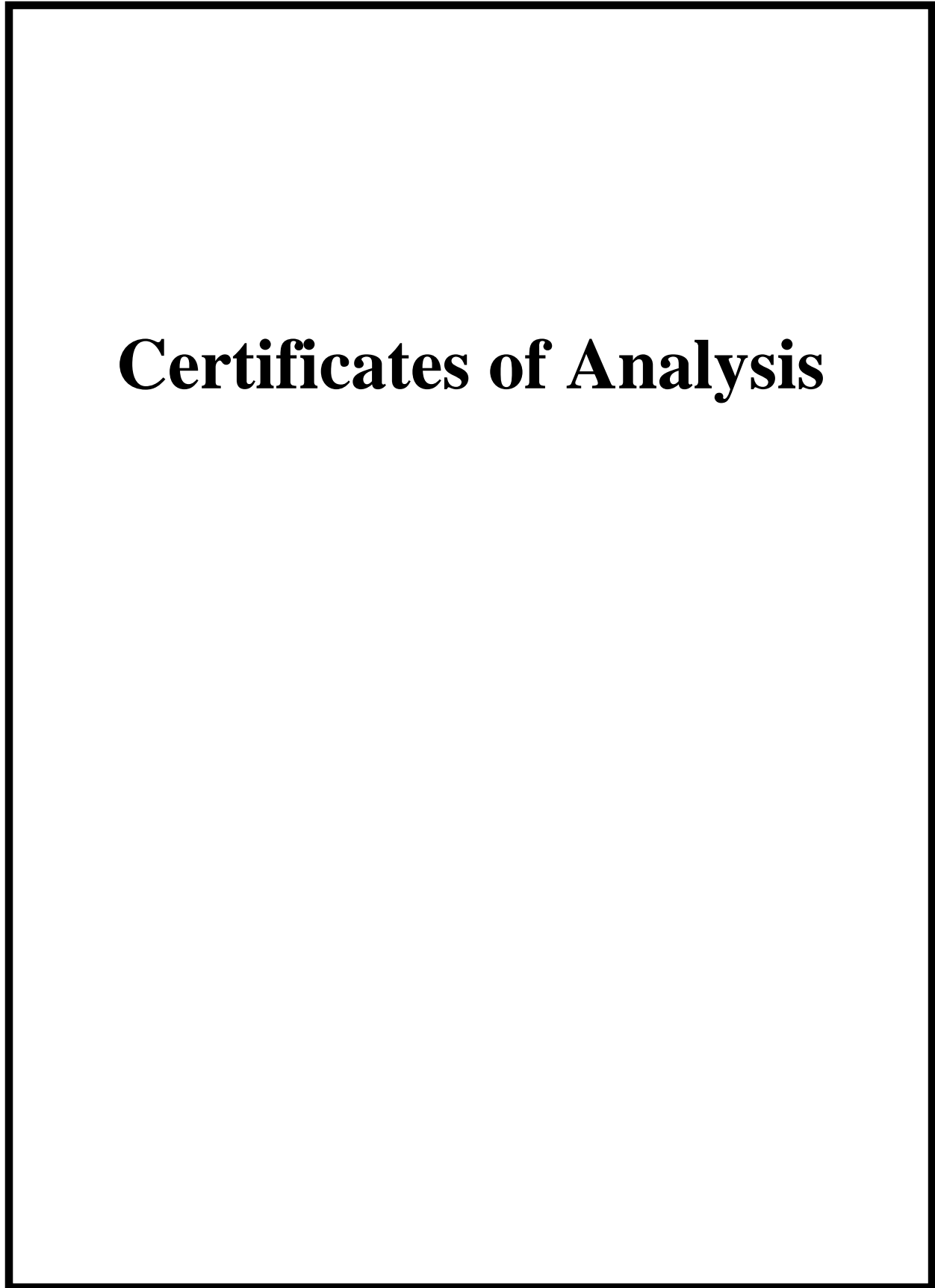
Client: <u>WVNS</u>	SDG/AR/COC/Work Order: <u>470349</u>
Received By: <u>GM</u>	Date Received: <u>2/11/19</u>
Carrier and Tracking Number	Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: _____ UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>1.5CPM/mR/hr</u> Classified as: Rad 1 <input type="checkbox"/> Rad 2 <input type="checkbox"/> Rad 3 <input checked="" type="checkbox"/>
D) Did the client designate samples are hazardous?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other: _____

Sample Receipt Criteria	Yes	N/A	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice <u>None</u> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>14°c</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR 4-10</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
				Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
				Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials WV Date 2/11 Page 1 of 1



Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: February 25, 2019

Client Sample ID: HEV Floor North
 Sample ID: 470349001
 Matrix: Filter
 Collect Date: 22-MAR-18
 Receive Date: 01-FEB-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.00301	+/-0.000324	0.000117	+/-0.000592	2.00E-06	uCi/sample			JXB7	02/22/19	0906	1849094	1
Plutonium-239/240	Hh	0.00432	+/-0.000382	6.14E-05	+/-0.000808	2.00E-06	uCi/sample							
Plutonium-242	Hh	0.000151	+/-7.75E-05	6.77E-05	+/-8.14E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	-1.30E-05	+/-3.15E-05	8.09E-05	+/-3.16E-05	2.00E-06	uCi/sample			JXB7	02/22/19	0845	1849095	2
Uranium-233/234	HUh	4.67E-06	+/-3.25E-05	6.69E-05	+/-3.25E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	2.42E-06	+/-2.53E-05	5.29E-05	+/-2.54E-05	2.00E-06	uCi/sample							
Uranium-238	HUh	-4.14E-06	+/-1.83E-05	4.78E-05	+/-1.84E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.0193	+/-0.000117	5.38E-06	+/-0.00508	2.00E-06	uCi/sample			JXB7	02/21/19	1626	1849096	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	H	0.00838	+/-0.000438	0.000261	+/-0.00122		uCi/sample			AXM6	02/11/19	1528	1849092	4
Cesium-137	H	0.0735	+/-0.000733	0.000137	+/-0.00629	2.00E-07	uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	JXB7	02/15/19	0944	1849093

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1849094	76	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1849095	66.2	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1849095	85.2	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1849096	97.2	(25%-125%)

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 25, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: HEV Floor North
 Sample ID: 470349001

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: February 25, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: HEV Floor South

Sample ID: 470349002

Matrix: Filter

Collect Date: 22-MAR-18

Receive Date: 01-FEB-19

Collector: Client

Project: WVNS02501

Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.000414	+/-0.00012	7.25E-05	+/-0.000137	2.00E-06	uCi/sample			JXB7	02/22/19	0906	1849094	1
Plutonium-239/240	Hh	0.000515	+/-0.000132	6.70E-05	+/-0.000156	2.00E-06	uCi/sample							
Plutonium-242	HUh	2.32E-05	+/-3.75E-05	5.81E-05	+/-3.77E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	HUh	8.52E-06	+/-5.47E-05	0.000106	+/-5.47E-05	2.00E-06	uCi/sample			JXB7	02/22/19	0845	1849095	2
Uranium-233/234	HUh	5.02E-06	+/-2.85E-05	5.62E-05	+/-2.85E-05	2.00E-06	uCi/sample							
Uranium-235/236	HUh	4.80E-06	+/-2.67E-05	5.11E-05	+/-2.67E-05	2.00E-06	uCi/sample							
Uranium-238	Hh	7.84E-05	+/-5.75E-05	5.09E-05	+/-5.93E-05	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.00366	+/-5.06E-05	4.85E-06	+/-0.000962	2.00E-06	uCi/sample			JXB7	02/21/19	1626	1849096	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	H	0.00184	+/-0.000254	0.000238	+/-0.000355		uCi/sample			AXM6	02/13/19	0509	1849092	4
Cesium-137	H	0.0792	+/-0.000753	0.00013	+/-0.00677	2.00E-07	uCi/sample							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	JXB7	02/15/19	0944	1849093

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1849094	86.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1849095	76.5	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1849095	79.9	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1849096	97.2	(25%-125%)

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste
 Client Sample ID: HEV Floor South
 Sample ID: 470349002

Report Date: February 25, 2019

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 25, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 470349

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1849092										
QC1204218777	470349001	DUP									
Americium-241		H	0.00838	H	0.0091 uCi/sample	8.25		(0%-20%)	AXM6	02/12/19	11:38
Cesium-137		H	0.0735	H	0.0761 uCi/sample	3.54		(0%-20%)			
QC1204218778	LCS										
Cobalt-60	0.00714				0.0073 uCi/sample		102	(75%-125%)		02/13/19	09:49
Americium-241	0.0295				0.0273 uCi/sample		92.5	(75%-125%)			
Cesium-137	0.0103				0.00963 uCi/sample		93.6	(75%-125%)			
QC1204218776	MB										
Americium-241				U	6.69E-05 uCi/sample					02/13/19	07:41
Cesium-137				U	-2.20E-05 uCi/sample						
Batch	1849094										
QC1204218786	470349001	DUP									
Plutonium-238		Hh	0.00301	H	0.00222 uCi/sample	30.2*		(0%-20%)	JXB7	02/22/19	09:06
Plutonium-239/240		Hh	0.00432	H	0.00302 uCi/sample	35.5*		(0%-20%)			
Plutonium-242		Hh	0.000151	H	8.89E-05 uCi/sample	52		(0% - 100%)			
QC1204218787	LCS										
Plutonium-238				U	-1.01E-05 uCi/sample					02/22/19	09:06
Plutonium-239/240	0.002				0.0023 uCi/sample		115	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 470349

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1849094										
Plutonium-242			U	3.66E-05	uCi/sample			(75%-125%)	JXB7	02/22/19	09:06
QC1204218785	MB										
Plutonium-238			U	-5.76E-06	uCi/sample					02/22/19	09:06
Plutonium-239/240			U	-1.54E-05	uCi/sample						
Plutonium-242			U	7.68E-06	uCi/sample						
Batch	1849095										
QC1204218789	470349001	DUP									
Uranium-232	HUh	-1.30E-05	HU	3.66E-06	uCi/sample	N/A		N/A	JXB7	02/22/19	08:45
Uranium-233/234	HUh	4.67E-06	HU	3.60E-05	uCi/sample	N/A		N/A			
Uranium-235/236	HUh	2.42E-06	HU	1.60E-05	uCi/sample	N/A		N/A			
Uranium-238	HUh	-4.14E-06	HU	3.43E-05	uCi/sample	N/A		N/A			
QC1204218790	LCS										
Uranium-232			U	0.000118	uCi/sample			(75%-125%)		02/22/19	08:45
Uranium-233/234				0.00294	uCi/sample						
Uranium-235/236				0.000118	uCi/sample						
Uranium-238	0.00273			0.00291	uCi/sample		107	(75%-125%)			
QC1204218788	MB										
Uranium-232			U	-2.16E-05	uCi/sample					02/22/19	08:45
Uranium-233/234			U	3.71E-05	uCi/sample						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 470349

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1849095										
Uranium-235/236			U	1.48E-05	uCi/sample				JXB7	02/22/19	08:45
Uranium-238			U	-5.59E-06	uCi/sample						
Batch	1849096										
QC1204218792	470349001	DUP									
Strontium-90		Hh	0.0193	H	0.0203	uCi/sample	4.74	(0%-20%)	JXB7	02/21/19	16:26
QC1204218793	LCS										
Strontium-90	0.000231				0.000223	uCi/sample	96.4	(75%-125%)		02/21/19	16:26
QC1204218791	MB										
Strontium-90			U	4.73E-06	uCi/sample					02/21/19	16:26

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 470349

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
UI		Gamma Spectroscopy--Uncertain identification									
UJ		Gamma Spectroscopy--Uncertain identification									
UL		Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X		Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y		Other specific qualifiers were required to properly define the results. Consult case narrative.									
^		RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
h		Preparation or preservation holding time was exceeded									

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.

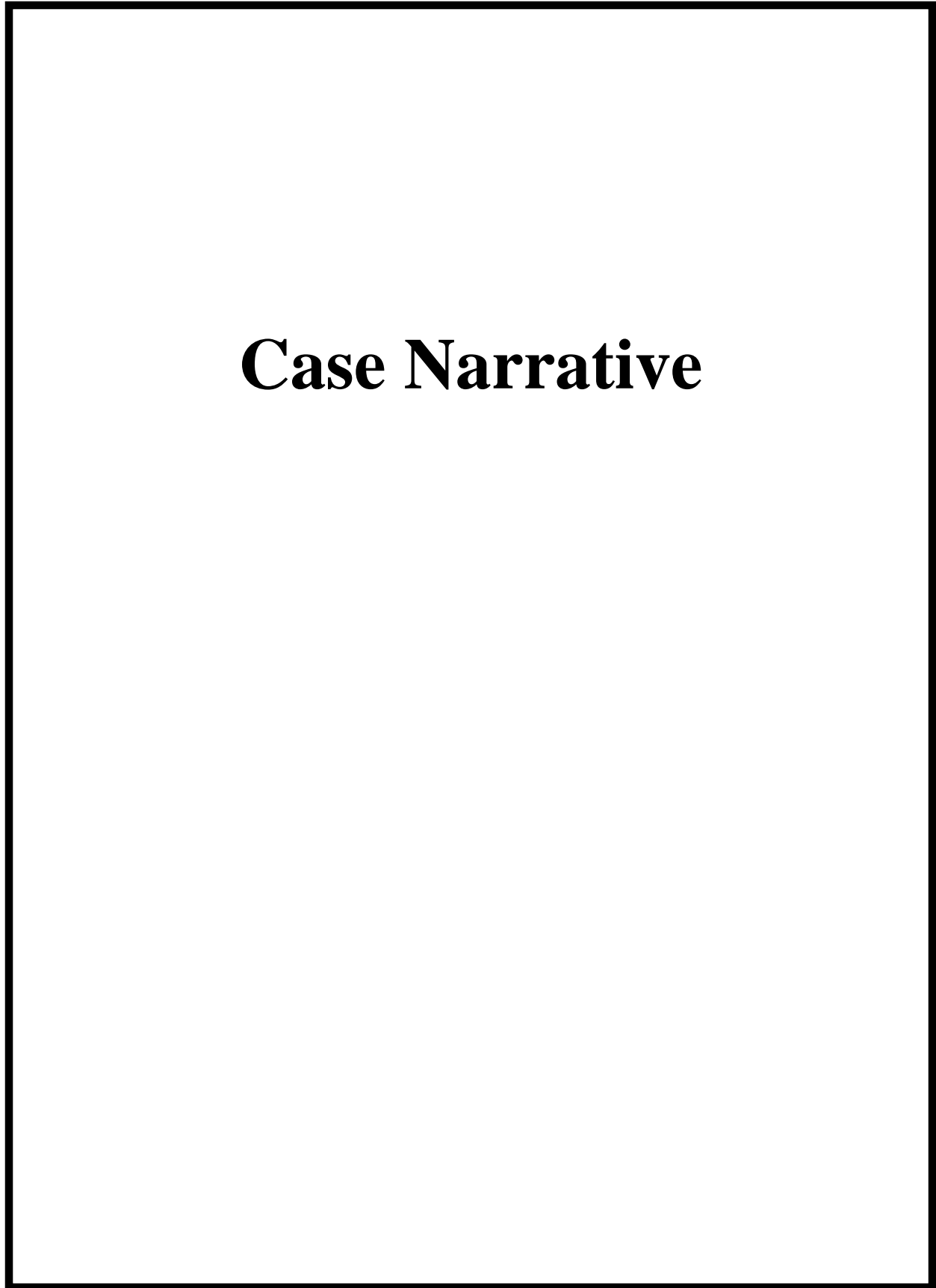
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 25 February 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-1
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-14
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 436-437-003169
Work Order #: 470349

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1849094

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1849093

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
470349001	HEV Floor North
470349002	HEV Floor South
1204218785	Method Blank (MB)
1204218786	470349001(HEV Floor North) Sample Duplicate (DUP)
1204218787	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

Duplication Criteria between QC Sample and Duplicate Sample

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204218786 (HEV Floor NorthDUP)	Plutonium-238	RPD 30.2* (0.00%-20.00%) RER 2.14 (0-3)
	Plutonium-239/240	RPD 35.5* (0.00%-20.00%) RER 2.63 (0-3)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204218785 (MB)	Plutonium-238	Result -0.00000576 < MDA 0.0000956 > RDL 0.000002 uCi/sample

WD:2020:0753 - Attachment B

	Plutonium-239/240	Result -0.0000154 < MDA 0.0000956 > RDL 0.000002 uCi/sample
--	-------------------	---

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204218786 (HEV Floor NorthDUP)	Received 01-FEB-19, out of holding 18-SEP-18
470349001 (HEV Floor North)	Received 01-FEB-19, out of holding 18-SEP-18
470349002 (HEV Floor South)	Received 01-FEB-19, out of holding 18-SEP-18

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1849095

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1849093

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
470349001	HEV Floor North
470349002	HEV Floor South
1204218788	Method Blank (MB)
1204218789	470349001(HEV Floor North) Sample Duplicate (DUP)
1204218790	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
--------	---------	-------

WD:2020-0753 - Attachment B

1204218788 (MB)	Uranium-232	Result -0.0000216 < MDA 0.0000729 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.0000371 < MDA 0.0000637 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000148 < MDA 0.0000578 > RDL 0.000002 uCi/sample
	Uranium-238	Result -0.00000559 < MDA 0.0000637 > RDL 0.000002 uCi/sample
1204218789 (HEV Floor NorthDUP)	Uranium-232	Result 0.00000366 < MDA 0.000083 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.000036 < MDA 0.0000588 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.000016 < MDA 0.0000461 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000343 < MDA 0.0000344 > RDL 0.000002 uCi/sample
470349001 (HEV Floor North)	Uranium-232	Result -0.000013 < MDA 0.0000809 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.00000467 < MDA 0.0000669 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.00000242 < MDA 0.0000529 > RDL 0.000002 uCi/sample
	Uranium-238	Result -0.00000414 < MDA 0.0000478 > RDL 0.000002 uCi/sample
470349002 (HEV Floor South)	Uranium-232	Result 0.00000852 < MDA 0.000106 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.00000502 < MDA 0.0000562 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000048 < MDA 0.0000511 > RDL 0.000002 uCi/sample

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204218788 (MB)	Uranium-232	Result -0.0000216 < MDA 0.0000729 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.0000371 < MDA 0.0000637 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000148 < MDA 0.0000578 > RDL 0.000002 uCi/sample
	Uranium-238	Result -0.00000559 < MDA 0.0000637 > RDL 0.000002 uCi/sample
1204218789 (HEV Floor NorthDUP)	Uranium-232	Result 0.00000366 < MDA 0.000083 > RDL 0.000002 uCi/sample

WD:2020:0753 - Attachment B

	Uranium-233/234	Result 0.000036 < MDA 0.0000588 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.000016 < MDA 0.0000461 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.0000343 < MDA 0.0000344 > RDL 0.000002 uCi/sample
470349001 (HEV Floor North)	Uranium-232	Result -0.000013 < MDA 0.0000809 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.00000467 < MDA 0.0000669 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.00000242 < MDA 0.0000529 > RDL 0.000002 uCi/sample
	Uranium-238	Result -0.00000414 < MDA 0.0000478 > RDL 0.000002 uCi/sample
470349002 (HEV Floor South)	Uranium-232	Result 0.00000852 < MDA 0.000106 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result 0.00000502 < MDA 0.0000562 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.0000048 < MDA 0.0000511 > RDL 0.000002 uCi/sample

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204218789 (HEV Floor NorthDUP)	Received 01-FEB-19, out of holding 18-SEP-18
470349001 (HEV Floor North)	Received 01-FEB-19, out of holding 18-SEP-18
470349002 (HEV Floor South)	Received 01-FEB-19, out of holding 18-SEP-18

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1849093

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
470349001	HEV Floor North
470349002	HEV Floor South

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

WD:2020:0753 - Attachment B

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: Gammaspec, Gamma, Cs137, Filter HIGH RAD

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1849092

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
470349001	HEV Floor North
470349002	HEV Floor South
1204218776	Method Blank (MB)
1204218777	470349001(HEV Floor North) Sample Duplicate (DUP)
1204218778	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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204218776 (MB)	Cesium-137	Result -0.000022 < MDA 0.0000634 > RDL 0.0000002 uCi/sample

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204218777 (HEV Floor NorthDUP)	Received 01-FEB-19, out of holding 18-SEP-18
470349001 (HEV Floor North)	Received 01-FEB-19, out of holding 18-SEP-18
470349002 (HEV Floor South)	Received 01-FEB-19, out of holding 18-SEP-18

Product: GFPC, Sr90, filter HIGH RAD**Analytical Method:** EPA 905.0 Modified/DOE RP501 Rev. 1 Modified**Analytical Procedure:** GL-RAD-A-004 REV# 21**Analytical Batch:** 1849096**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1849093

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
470349001	HEV Floor North
470349002	HEV Floor South
1204218791	Method Blank (MB)
1204218792	470349001(HEV Floor North) Sample Duplicate (DUP)
1204218793	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204218791 (MB)	Strontium-90	Result 0.00000473 < MDA 0.0000048 > RDL 0.000002 uCi/sample

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204218792 (HEV Floor NorthDUP)	Received 01-FEB-19, out of holding 18-SEP-18
470349001 (HEV Floor North)	Received 01-FEB-19, out of holding 18-SEP-18
470349002 (HEV Floor South)	Received 01-FEB-19, out of holding 18-SEP-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 436-437-003169 GEL Work Order: 470349

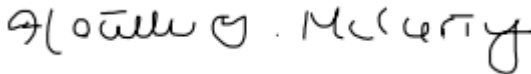
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Heather McCarty**Date:** 23 FEB 2019**Title:** Analyst II

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1849093
Analyst: Jon Burgess (JXB7)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 25-FEB-2019 **Hold:** 18-SEP-2018 **Package:** 27-FEB-2019 **SDG:** 01-MAR
Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	470349001	15-FEB-2019		1	78.2157	78.9202	78.9202	100	0.7045	0.7045
2	470349002	15-FEB-2019		1	73.6762	74.32	74.32	100	0.6438	0.6438

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

This page intentionally left blank

Mini Cell – Miniature Cell

This page intentionally left blank



March 02, 2020

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 503537
SDG: 452-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 06, 2020. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4708.

Sincerely,

Kerry OBarr for
Taylor Cannon
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

March 2, 2020

Release Number

452

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.02

Description

Mini Cell B floor sample

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 452-003169
Work Order: 503537

March 02, 2020

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

452

Charge Number

WV01.C2.06.01.04.10.02

Summary

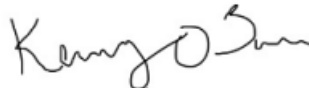
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on February 06, 2020 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
503537001	Mini Cell B floor sample

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Taylor Cannon
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
 (Page 1 of 2)

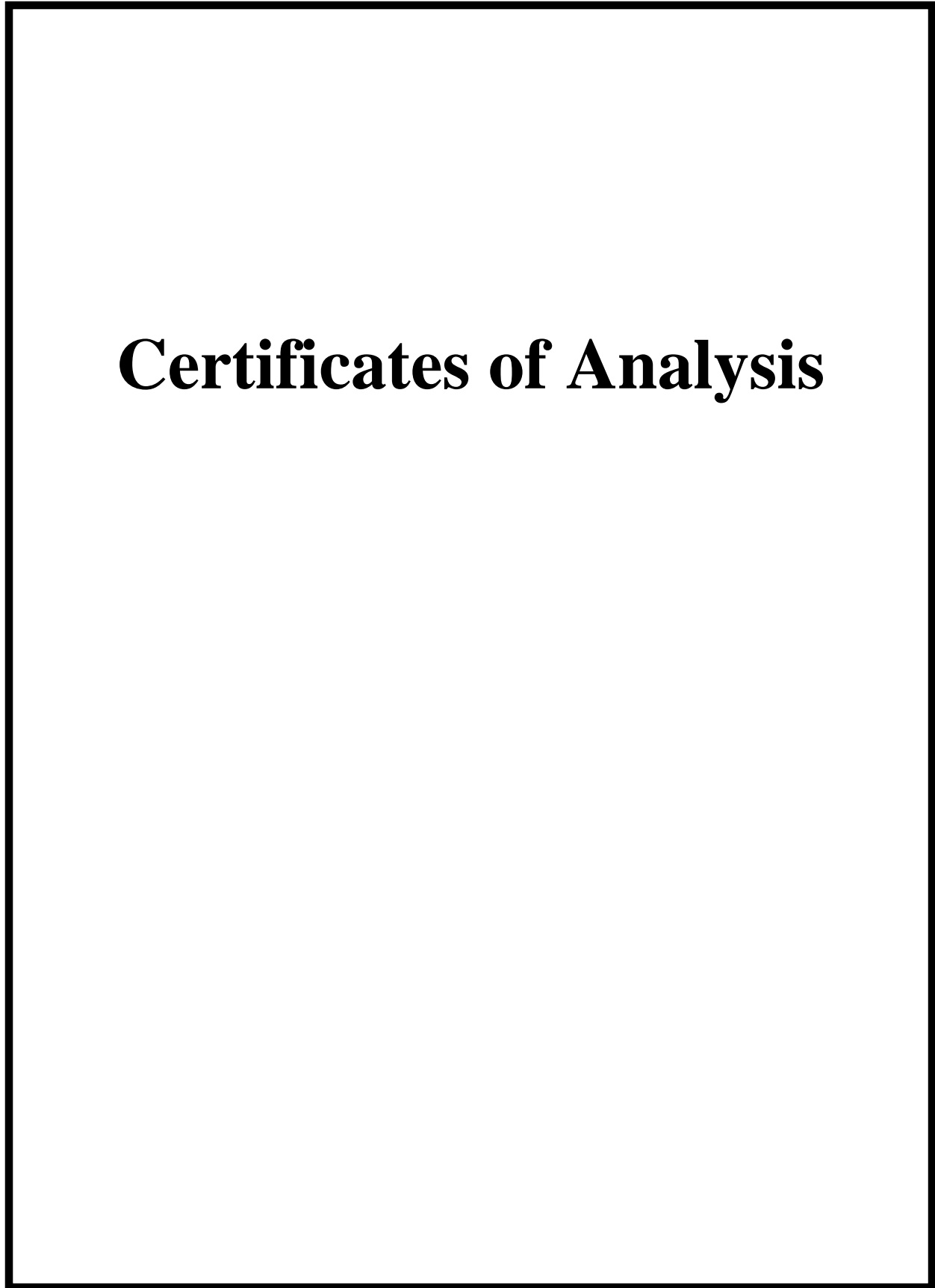
503537

CH2M HILL BWXT, West Valley LLC
 10282 Rock Springs Road
 West Valley, NY 14171-9799

1. Lab: GEL	2. Charge #: WV01.C2.06.01.04.10.02	3. Analysis Requested		4. Electronic Disk? Yes [] No [X]		
5. PO #: CH-003169	6. Release #: 452			7. Report Format Level: I [X] II []		
8. Cognizant Engineer/Project: FDP						
10. DQO/SAP#: WVDP-584						
12.						
Sample ID#	Type	# Cont.	Pres.	Date	Time	pH
Mini Cell B floor sample	Grab	1	none	12.30.19	13:54	n/a
* rad isotopes						
X						
11. Report Data To: W. Connors					Comments	
report in uCi/g						
*Am-241, Cs-137, Pu-238, Pu-239, Pu-240, Pu-241, Sr-90, U-232, U-233, U-234, U-235, U-238						
18.						
Gross Wt (g)	27.5		Phase (Circle one):		Solid	Liquid
Tare Wt (g)	24.3		Type (Circle one):		Debris	Sludge
Net Wt (g)	3.2		Sample Bottle Size:		125 ml	Other:
17. Chain-of-Custody Reviewed by: <i>Deborah Wheeler</i>						
19. Sample Custodian Signature/Date/Time						
Released by: <i>Dann Rader</i> 12-31-19 0731 Received by: <i>Jean Wheeler</i> 12-31-19 0731						
Released by: <i>AK</i> 2-5-20 13:46 Received by: <i>JZ</i> 2/6/20 9:05						
Released by: _____ Received by: _____						
Released by: _____ Received by: _____						
16. Sample Receipt:						
Sample Bottle Type (Circle One): Glass <input checked="" type="radio"/> Poly <input type="radio"/>						
16. <10 mCi Alpha NA []						
Temperature _____ °C						
Cooler Seals Intact? Yes [X] No []						

SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>503537</u>			
Received By: <u>ZW/RSO</u>		Date Received: <u>2/6/20</u>			
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>8107 1740 9564</u>			
Suspected Hazard Information		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hazard Class Shipped: <u>Yellow II</u> UN#: <u>2915</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___			
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	COC notation or radioactive stickers on containers equal client designation			
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>>200CPM / mR/hr</u> Classified as: Rad 1 Rad 2 <u>Rad 3</u>			
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	COC notation or hazard labels on containers equal client designation			
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:			
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	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 < 6 deg. C)?*		<input checked="" type="checkbox"/>		Preservation Method: Wet Ice <u>Ice Packs</u> Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>122-19</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?				If Yes, are Encores or Soil Kits present for solids? Yes No NA (If yes, take to VOA Freezer)
					Do liquid VOA vials contain acid preservation? Yes No NA (If unknown, select No)
		<input checked="" type="checkbox"/>			Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected:
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"/>			ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Circle Applicable: No container count on COC Other (describe)
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"/>			Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed):					



Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: March 2, 2020

Client Sample ID: Mini Cell B floor sample
 Sample ID: 503537001
 Matrix: Solid
 Collect Date: 30-DEC-19
 Receive Date: 06-FEB-20
 Collector: Client
 Moisture: 1.22%

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>"As Received"</i>														
<i>Alphaspec Am241 Solid High Rad "As Received"</i>														
Americium-241		1.94	+/-0.135	0.0180	+/-0.405	1.00E-05	uCi/g			JXB7	02/19/20	1525	1970427	2
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238		0.469	+/-0.0148	0.000784	+/-0.157	1.00E-06	uCi/g			AXM6	02/20/20	2215	1971891	3
Plutonium-239/240		0.527	+/-0.0157	0.000541	+/-0.177	1.00E-06	uCi/g							
Plutonium-242	X	0.00351	+/-0.00131	0.000540	+/-0.00176	1.00E-06	uCi/g							
<i>Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"</i>														
Uranium-232	U	-0.00502	+/-0.00962	0.0223	+/-0.00962	1.00E-06	uCi/g			JXB7	02/19/20	1521	1970434	4
Uranium-233/234	U	0.00122	+/-0.00584	0.0110	+/-0.00585	1.00E-06	uCi/g							
Uranium-235/236	U	0.00810	+/-0.0107	0.0160	+/-0.0108	1.00E-06	uCi/g							
Uranium-238	U	-0.000950	+/-0.00420	0.0110	+/-0.00421	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90		6.72	+/-0.0343	0.00140	+/-1.24	1.00E-04	uCi/g			AXM6	02/21/20	0639	1971823	5
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241		2.51	+/-0.0269	0.0137	+/-0.196		uCi/g			JXB7	02/18/20	1434	1967079	6
Cesium-137		20.5	+/-0.0421	0.00465	+/-1.72	1.00E-05	uCi/g							
Cobalt-60		0.000823	+/-0.000595	0.000649	+/-0.000599		uCi/g							
Europium-154		0.0394	+/-0.00419	0.00153	+/-0.00528	1.00E-06	uCi/g							
<i>Liquid Scint Pu241, Solid High Rad "As Received"</i>														
Plutonium-241		4.02	+/-0.0787	0.00667	+/-2.76	1.00E-05	uCi/g			JXB7	02/20/20	0703	1970438	7

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Proc	Dissolution Soil Prep GL-RAD-A-015	AXM6	02/14/20	1552	1968509

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Am-05-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	DOE EML HASL-300, U-02-RC Modified
5	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
6	DOE HASL 300, 4.5.2.3/Ga-01-R
7	DOE EML HASL-300, Pu-11-RC Modified

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: March 2, 2020

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: Mini Cell B floor sample
 Sample ID: 503537001

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test					Batch ID	Recovery%	Acceptable Limits				
Americium-243 Tracer		Alphaspec Am241 Solid High Rad "As Received"					1970427	94.9	(15%-125%)				
Curium-243/244 Tracer		Alphaspec Am241 Solid High Rad "As Received"					1970427	106	(15%-125%)				
Plutonium-236 Tracer		Alphaspec Pu242, Solid High Rad "As Received"					1971891	100	(15%-125%)				
Uranium-232 Tracer		Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"					1970434	82.7	(15%-125%)				
Uranium-235/236 Tracer		Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"					1970434	95.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid High Rad "As Received"					1971823	81.4	(25%-125%)				
Plutonium-236 Tracer		Liquid Scint Pu241, Solid High Rad "As Received"					1970438	118	(15%-125%)				

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 2, 2020

Page 1 of 6

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 503537

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1967079										
QC1204493539	502038001	DUP									
Americium-241		0.00220		0.00213	uCi/g	3.09		(0% - 100%)	JXB7	02/18/20	16:55
Cobalt-60	U	1.80E-05	U	8.58E-06	uCi/g	N/A		N/A			
Cesium-137		2.06		2.08	uCi/g	1.06		(0%-20%)			
Europium-154		0.000372	U	7.20E-05	uCi/g	62.8		(0% - 100%)			
QC1204493540	LCS										
Americium-241	0.0827			0.0899	uCi/g		109	(75%-125%)		02/18/20	16:55
Cobalt-60	0.0353			0.0367	uCi/g		104	(75%-125%)			
Cesium-137	0.0315			0.0304	uCi/g		96.3	(75%-125%)			
Europium-154			U	0.000132	uCi/g						
QC1204493538	MB										
Americium-241			U	5.53E-06	uCi/g					02/18/20	16:54
Cobalt-60			U	1.14E-06	uCi/g						
Cesium-137			U	6.18E-07	uCi/g						
Europium-154			U	2.57E-06	uCi/g						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 503537

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1970427										
QC1204501314	502022001	DUP									
Americium-241	U	6.98E-07	U	-1.17E-06	uCi/g	N/A		N/A	JXB7	02/19/20	15:17
**Americium-243 Tracer	0.000280	0.000292		0.000243	uCi/g		86.7	(15%-125%)			
**Curium-243/244 Tracer	0.000288	0.000317		0.000326	uCi/g		113	(15%-125%)			
QC1204501316	LCS										
Americium-241	0.000246			0.000257	uCi/g		105	(75%-125%)		02/19/20	15:17
**Americium-243 Tracer	0.000280			0.000238	uCi/g		85	(15%-125%)			
**Curium-243/244 Tracer	0.000286			0.000300	uCi/g		105	(15%-125%)			
QC1204501313	MB										
Americium-241			U	4.07E-06	uCi/g					02/19/20	15:17
**Americium-243 Tracer	0.000280			0.000223	uCi/g		79.8	(15%-125%)			
**Curium-243/244 Tracer	0.000286			0.000192	uCi/g		67.3	(15%-125%)			
QC1204501315	502022001	MS									
Americium-241	0.000246	U	6.98E-07	0.000245	uCi/g		99.4	(75%-125%)		02/20/20	11:21
**Americium-243 Tracer	0.000280			0.000290	uCi/g		104	(15%-125%)			
**Curium-243/244 Tracer	0.000288			0.000317	uCi/g		109	(15%-125%)			
Batch	1970434										
QC1204501318	502022001	DUP									
Uranium-232	U	1.27E-06	U	-1.19E-06	uCi/g	N/A		N/A	JXB7	02/19/20	15:21
Uranium-233/234	U	5.78E-07	U	5.10E-06	uCi/g	N/A		N/A			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 503537

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1970434										
Uranium-235/236	U	1.89E-06	U	3.49E-06	uCi/g	N/A		N/A	JXB7	02/19/20	15:21
Uranium-238	U	-1.88E-07	U	-1.63E-07	uCi/g	N/A		N/A			
QC1204501320	LCS										
Uranium-232			U	2.33E-06	uCi/g					02/19/20	15:21
Uranium-233/234				0.000309	uCi/g						
Uranium-235/236				1.36E-05	uCi/g						
Uranium-238	0.000341			0.000310	uCi/g		90.8	(75%-125%)			
QC1204501317	MB										
Uranium-232			U	-3.21E-07	uCi/g					02/19/20	15:21
Uranium-233/234			U	2.26E-06	uCi/g						
Uranium-235/236			U	3.04E-07	uCi/g						
Uranium-238			U	-1.36E-06	uCi/g						
QC1204501319	502022001 MS										
Uranium-232	U	1.27E-06	U	-1.14E-06	uCi/g					02/19/20	15:21
Uranium-233/234	U	5.78E-07		0.000288	uCi/g						
Uranium-235/236	U	1.89E-06		1.83E-05	uCi/g						
Uranium-238	0.000341	U	-1.88E-07	0.000318	uCi/g		93.3	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 503537

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1970438										
QC1204501329	502022001	DUP									
Plutonium-241	U	-0.000453	U	0.000187	uCi/g	N/A		N/A	JXB7	02/20/20	07:22
QC1204501331	LCS										
Plutonium-241	0.0102			0.00988	uCi/g		96.8	(75%-125%)		02/20/20	07:54
QC1204501328	MB										
Plutonium-241			U	0.000145	uCi/g					02/20/20	07:06
QC1204501330	502022001	MS									
Plutonium-241	0.0103	U	-0.000453	0.0123	uCi/g		119	(75%-125%)		02/20/20	07:38
Batch	1971823										
QC1204504615	502022001	DUP									
Strontium-90				4.53E-05	5.04E-05	uCi/g	10.7	(0% - 100%)	AXM6	02/21/20	06:39
QC1204504617	LCS										
Strontium-90	0.000573			0.000663	uCi/g		116	(75%-125%)		02/21/20	06:39
QC1204504614	MB										
Strontium-90				6.64E-05	uCi/g					02/21/20	06:39
QC1204504616	502022001	MS									
Strontium-90	0.000575		4.53E-05	0.000654	uCi/g		106	(75%-125%)		02/21/20	06:39
Batch	1971891										
QC1204504812	502038001	DUP									
Plutonium-238			0.000730	U	-2.25E-07	uCi/g	98.3	(0% - 100%)	AXM6	02/20/20	22:15
Plutonium-239/240			0.00141	U	-1.41E-05	uCi/g	121*	(0%-20%)			
Plutonium-242	U	0.000119	U	0.000124	uCi/g	N/A		N/A			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 503537

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1971891										
QC1204504814	LCS										
Plutonium-238			U	3.00E-06	uCi/g				AXM6	02/20/20	22:15
Plutonium-239/240	0.000251			0.000211	uCi/g		84.3	(75%-125%)			
Plutonium-242			U	2.60E-06	uCi/g						
QC1204504811	MB										
Plutonium-238			U	7.29E-06	uCi/g					02/20/20	22:15
Plutonium-239/240			U	-5.22E-07	uCi/g						
Plutonium-242			U	-6.95E-07	uCi/g						
QC1204504813	502038001	MS									
Plutonium-238		0.000730	U	5.63E-05	uCi/g					02/20/20	22:15
Plutonium-239/240	0.00647	0.00141		0.00719	uCi/g		89.4	(75%-125%)			
Plutonium-242	U	0.000119		0.000559	uCi/g						

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J See case narrative for an explanation
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 503537

Page 6 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
M											
M											
N/A											
N1											
ND											
NJ											
Q											
R											
U											
UI											
UJ											
UL											
X											
Y											
^											
h											

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.

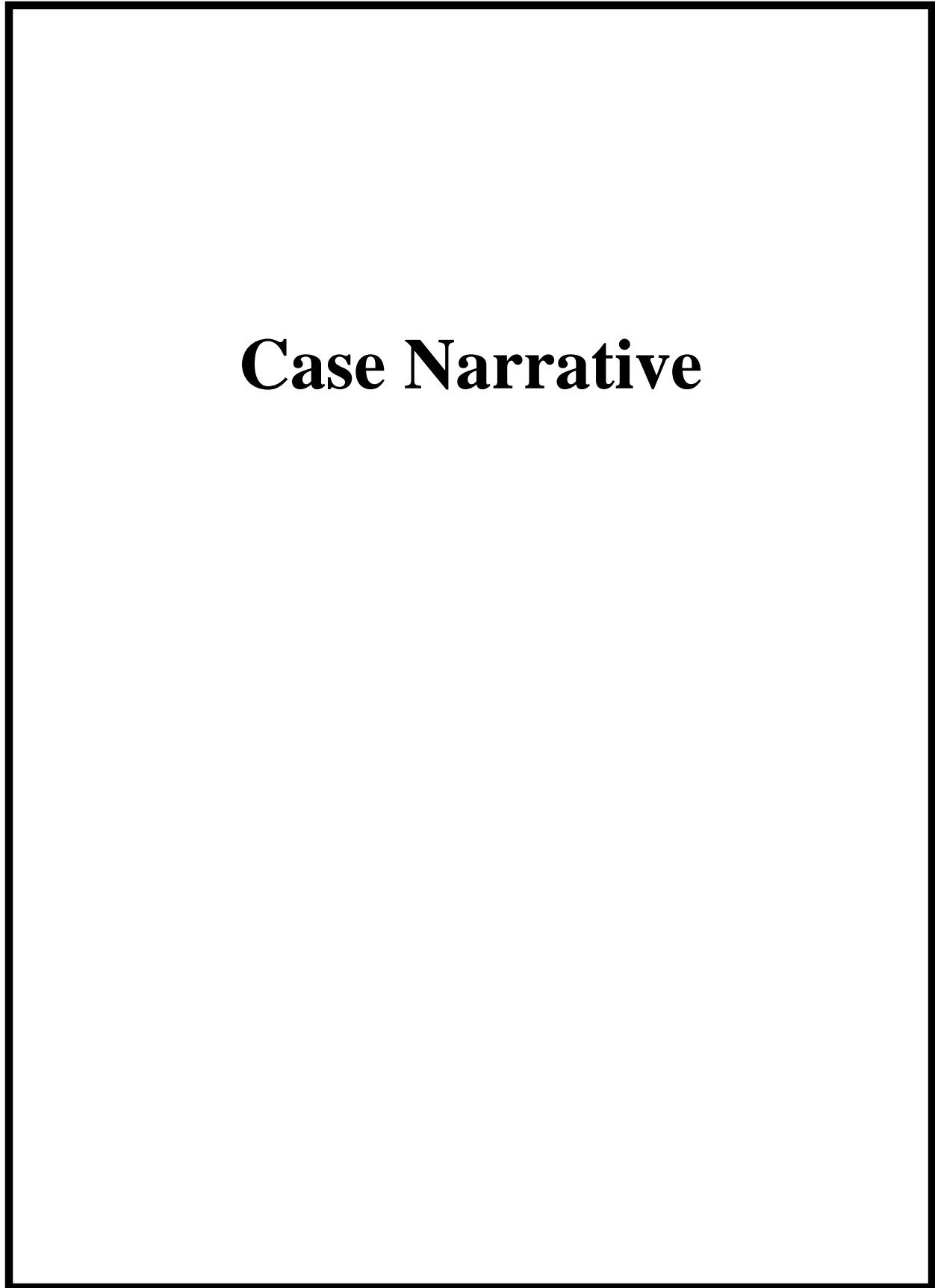
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 02 March 2020

State	Certification
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122020-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2019-165
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-20-16
Utah NELAP	SC000122019-30
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 452-003169
Work Order #: 503537

Product: Alphaspec Am241 Solid High Rad
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1970427

Preparation Method: Client Requested Procedure
Preparation Procedure: GL-RAD-A-015 REV# 18
Preparation Batch: 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204501313	Method Blank (MB)
1204501314	502022001(SNWSACOMP) Sample Duplicate (DUP)
1204501315	502022001(SNWSACOMP) Matrix Spike (MS)
1204501316	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.

Preparation Information

Aliquot Reduced

503537001 (Mini Cell B floor sample) aliquot was reduced due to high activity based on Gamma data.

Technical Information

Recounts

The Am-243 traced portion of sample 1204501315 (SNWSACOMPMS) was recounted due to a peak shift. The recount is reported.

Product: Alphaspec U232, 233, 234, 235, 238 Solid High Rad
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1970434

WD:2020:0753 - Attachment B

Preparation Method: Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204501317	Method Blank (MB)
1204501318	502022001(SNWSACOMP) Sample Duplicate (DUP)
1204501319	502022001(SNWSACOMP) Matrix Spike (MS)
1204501320	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.

Preparation Information**Aliquot Reduced**

503537001 (Mini Cell B floor sample) aliquot was reduced due to high activity based on Gamma data.

Quality Control (QC) Information**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204501317 (MB)	Uranium-232	Result -0.000000321 < MDA 0.0000109 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.00000226 < MDA 0.00000578 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.000000304 < MDA 0.00000735 > RDL 0.000001 uCi/g
	Uranium-238	Result -0.00000136 < MDA 0.000007 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204501318 (SNWSACOMPDUPE)	Uranium-232	Result -0.00000119 < MDA 0.00000994 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.0000051 < MDA 0.0000063 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.00000349 < MDA 0.00000498 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Uranium-238	Result -0.000000163 < MDA 0.0000057 > RDL 0.000001 uCi/g
503537001 (Mini Cell B floor sample)	Uranium-232	Result -0.00502 < MDA 0.0223 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.00122 < MDA 0.011 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.0081 < MDA 0.016 > RDL 0.000001 uCi/g
	Uranium-238	Result -0.00095 < MDA 0.011 > RDL 0.000001 uCi/g

Miscellaneous Information

Additional Comments

The tracer peak centroid for sample 1204501319 (SNWSACOMPMS) is greater than 50 keV from the expected library energy value for the U-232 tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1971891

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204504811	Method Blank (MB)
1204504812	502038001(OGC floor core) Sample Duplicate (DUP)
1204504813	502038001(OGC floor core) Matrix Spike (MS)
1204504814	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

Duplication Criteria between QC Sample and Duplicate Sample

The Sample and Duplicate, (See Below), did not meet the duplication criteria list below due to the extremely small aliquot size used not being a true representation of the samples. The aliquots were reduced due to the high levels of activity in the samples.

WD:2020:0753 - Attachment B

Sample	Analyte	Value
1204504812 (OGC floor coreDUP)	Plutonium-239/240	RPD 121* (0.00%-20.00%)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204504811 (MB)	Plutonium-238	Result 0.00000729 < MDA 0.0000155 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result -0.000000522 < MDA 0.0000129 > RDL 0.000001 uCi/g
	Plutonium-242	Result -0.000000695 < MDA 0.0000135 > RDL 0.000001 uCi/g

The following detection limit was not achieved due to high sample activity.

Sample	Analyte	Value
1204504812 (OGC floor coreDUP)	Plutonium-238	Result -0.000000225 < MDA 0.000249 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result -0.0000141 < MDA 0.000347 > RDL 0.000001 uCi/g

Technical Information**Sample Re-prep/Re-analysis**

Samples were reprepared due to high blank activity. The re-analysis is being reported.

Miscellaneous Information**Manual Integration**

Manual integration of alpha spectroscopy spectra 503537001 (Mini Cell B floor sample) was performed to fully separate counts in Regions of Interest which would have been biased.

Additional Comments

Sample 1204504814 (LCS) did not meet the resolution requirement of having a full width half maximum of 100 keV or less for the tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Result may be biased high due to tailing from high levels of Pu-239/240 activity into the Pu-242 ROI.	Plutonium-242	503537001	Mini Cell B floor sample

WD:2020:0753 - Attachment B

Preparation Method: Client Requested Procedure
Preparation Procedure: GL-RAD-A-015 REV# 18
Preparation Batch: 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample

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: Dry Weight

Analytical Method: ASTM D 2216 (Modified)
Analytical Procedure: GL-OA-E-020 REV# 13
Analytical Batch: 1968514

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample

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: Gammascpec, Cs137 Only, solid High Rad

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R
Analytical Procedure: GL-RAD-A-013 REV# 27
Analytical Batch: 1967079

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204493538	Method Blank (MB)
1204493539	502038001(OGC floor core) Sample Duplicate (DUP)

WD:2020:0753 - Attachment B
1204493540 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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204493538 (MB)	Cesium-137	Result 0.000000618 < MDA 0.0000164 > RDL 0.00001 uCi/g

Technical Information

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	503537001	Mini Cell B floor sample
Europium-154	503537001	Mini Cell B floor sample

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1971823

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204504614	Method Blank (MB)
1204504615	502022001(SNWSACOMP) Sample Duplicate (DUP)
1204504616	502022001(SNWSACOMP) Matrix Spike (MS)
1204504617	Laboratory Control Sample (LCS)

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

WD:2020:0753 - Attachment B

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

Method Blank Criteria

The blank result (See Below) is greater than the MDC but less than the required detection limit.

Sample	Analyte	Value
1204504614 (MB)	Strontium-90	Result: 6.64E-05 uCi/g > MDA: 1.18E-05 uCi/g <= RDL: 1.00E-04 uCi/g

Technical Information

Sample Re-prep/Re-analysis

Samples were re-prepped due to high blank activity. The re-analysis is being reported.

Product: Liquid Scint Pu241, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 21

Analytical Batch: 1970438

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1968509

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
503537001	Mini Cell B floor sample
1204501328	Method Blank (MB)
1204501329	502022001(SNWSACOMP) Sample Duplicate (DUP)
1204501330	502022001(SNWSACOMP) Matrix Spike (MS)
1204501331	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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the

WD:2020:0753 - Attachment B
other sample aliquots.

Sample	Analyte	Value
1204501328 (MB)	Plutonium-241	Result 0.000145 < MDA 0.00146 > RDL 0.00001 uCi/g

Sample (See Below) did not meet the detection limit due to the small sample aliquot used. The aliquot was reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204501329 (SNWSACOMPDUP)	Plutonium-241	Result 0.000187 < MDA 0.00139 > RDL 0.00001 uCi/g

Miscellaneous Information

Additional Comments

Sample 1204501331 (LCS) did not meet the resolution requirement of having a full width half maximum of 100 keV or less for the tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 452-003169 GEL Work Order: 503537


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Review/Validation

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

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

Signature: **Name:** Theresa Austin**Date:** 28 FEB 2020**Title:** Group Leader

Moisture LogBook

Batch: 1968514
WD: 2020:0753 - Attachment B
Analyst: AXM6
Date/Time: 15-FEB-2020
Procedure Code DRY WEIGHT
Procedure Description Dry Weight-Percent Moisture
Lab Sop: GL-OA-E-020

Sample St Sample Id Rpd(%)

Sample Id	Sample Type	Original Hsn	Balance	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
503537001	SAMPLE		R2-38110047	15:04	8.9828	9.383	9.3781	0.4002	0.3953	1.224

Comments:

A) Result = (Net Initial - Net Final) / Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Evaporative Loss LogBook

GEL Laboratories LLC

Mini Cell Airlock – Miniature Cell Airlock

This page intentionally left blank



July 17, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 482537
SDG: 453-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 20, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

July 17, 2019

Release Number

453

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.02

Description

Mini Cell A. L. floor sample

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 453-003169
Work Order: 482537

July 17, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

453

Charge Number

WV01.C2.06.01.04.10.02

Summary

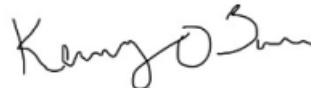
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on June 20, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
482537001	Mini Cell A. L. floor sample

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

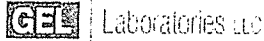
482537

WD:2020-0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL	2. Charge #: WV01.C2.06.01.04.10.02	3. Analysis Requested		4. Electronic Disk? Yes [] No [X]
5. PO #: CH-003169	6. Release #: 453			7. Report Format Level: I [X] II []
8. Cognizant Engineer/Project: FDP				9. Priority Code: Routine [X]
10. DQO/SAP#: WVDP-584				11. Report Data To: W. Connors
12.				Comments
Sample ID#	Type	# Cont.	Pres.	Date
Mini Cell	Grab	1	none	4/22/19
A.L.				Time
floor sample				1400
				pH
				n/a
*Am-241, Cs-137, Pu-238, Pu-239, Pu-240, Pu-242, Sr-90, U-232, U-233, U-234, U-235, U-238				
18. Gross Wt (g)	85.3	14. Phase (Circle one):	Solid	Liquid
Tare Wt (g)	67.1	Type (Circle one):	Debris	Coupon
Net Wt (g)	18.2	Sample Bottle Size:	500 ml	Sludge
17. Chain-of-Custody Reviewed by: Sean LeTalle		Sample Bottle Type (Circle One):	Glass	Other:
		16. <10 mCi Alpha	NA []	
		20. Sample Receipt:		
Released by: Camillo Ottaviano 4-23-19 14:00		Temperature	2 °C	
Released by: Sean LeTalle 4-23-19 14:40		Cooler Seals Intact? Yes [X] No []		
Released by: Sean LeTalle 6-19-19 13:20				
Released by: Sean LeTalle 6/20/19 10:25				
Released by:				



SAMPLE RECEIPT & REVIEW FORM

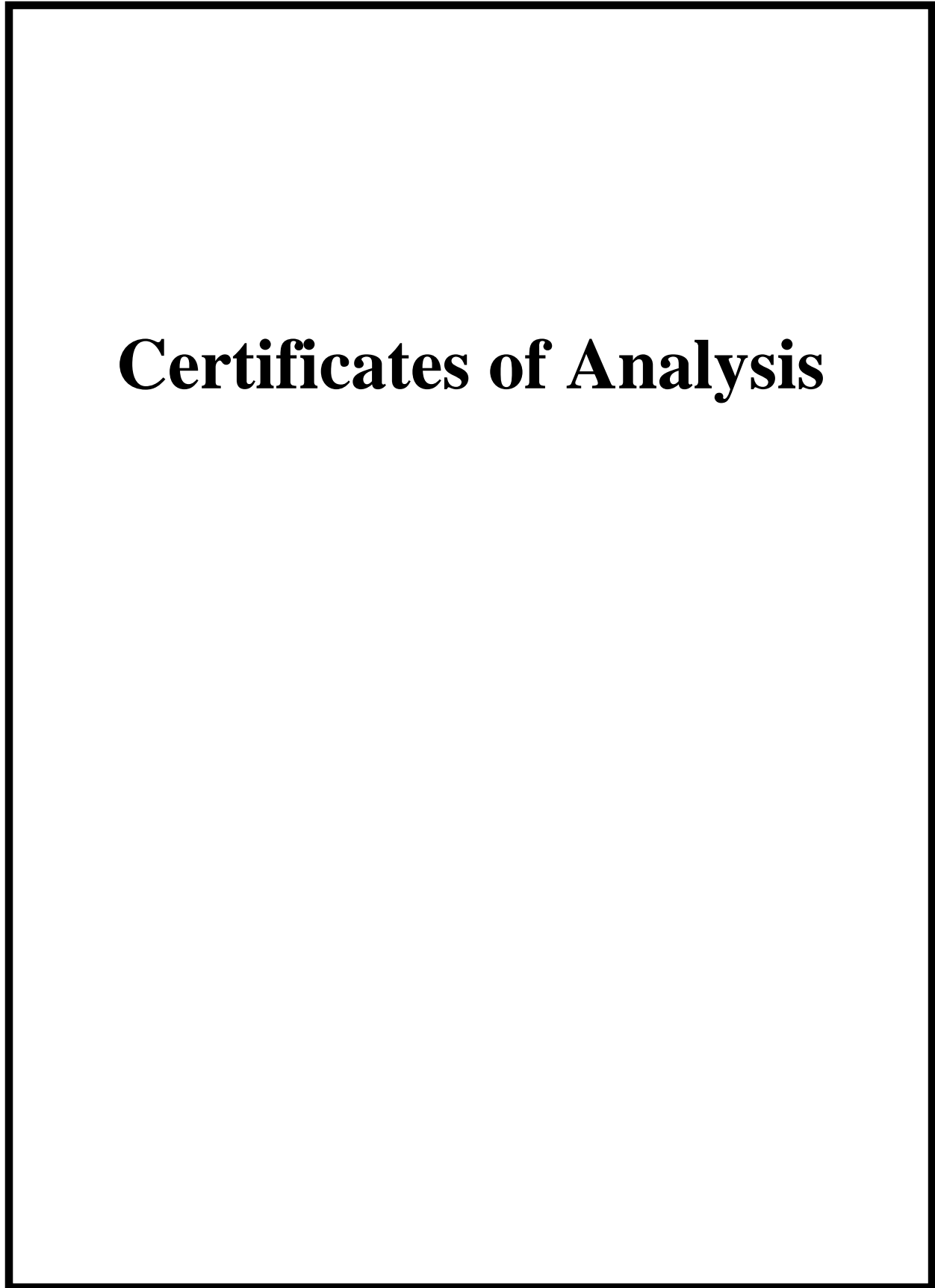
Client: <u>WVNS</u>	SDG/AR/COC/Work Order: <u>482537</u>
Received By: <u>Craig Austin</u>	Date Received: <u>6/20/19</u>
Carrier and Tracking Number	Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>81071470 9520</u>

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>1.1</u> CPM / <input checked="" type="checkbox"/> R/Hr Classified as: Rad 1 <input checked="" type="checkbox"/> Rad 2 <input type="checkbox"/> Rad 3 <input type="checkbox"/>
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>2.0 °C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR2-17</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No) Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe) <u>we did not receive 17520 or 17525 6/20/19</u>
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials WD Date 6/24 Page 1 of 1



Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: July 17, 2019

Client Sample ID: Mini Cell A. L. floor sample
 Sample ID: 482537001
 Matrix: Misc Solid
 Collect Date: 22-APR-19
 Receive Date: 20-JUN-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Am241,Cm243/244 Solid High Rad "As Received"</i>														
Americium-241		6.65E-06	+/-4.65E-06	5.52E-06	+/-4.73E-06	1.00E-05	uCi/g			JXB7	07/16/19	1409	1895766	1
Curium-243/244	U	-5.71E-07	+/-1.32E-06	3.92E-06	+/-1.32E-06	1.00E-06	uCi/g							
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238		7.99E-06	+/-2.60E-06	1.44E-06	+/-2.96E-06	1.00E-06	uCi/g			JXB7	07/11/19	1317	1890821	2
Plutonium-239/240		5.87E-06	+/-2.26E-06	1.52E-06	+/-2.49E-06	1.00E-06	uCi/g							
Plutonium-242	U	9.45E-07	+/-1.18E-06	1.78E-06	+/-1.19E-06	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	U	1.08E-06	+/-1.08E-06	1.44E-06	+/-1.09E-06	1.00E-06	uCi/g			JXB7	07/12/19	0810	1890121	3
Uranium-233/234	U	1.92E-07	+/-3.74E-07	5.86E-07	+/-3.75E-07	1.00E-06	uCi/g							
Uranium-235/236	U	1.69E-07	+/-3.33E-07	4.61E-07	+/-3.34E-07	1.00E-06	uCi/g							
Uranium-238	U	-2.30E-08	+/-1.99E-07	4.60E-07	+/-1.99E-07	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90		0.000819	+/-7.57E-05	5.25E-05	+/-0.000172	1.00E-04	uCi/g			JXB7	07/11/19	1506	1890118	4
<i>Gammasespec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	U	9.45E-05	+/-0.000189	0.000339	+/-0.000194		uCi/g			AXM6	07/01/19	0938	1889961	5
Cesium-137		0.0142	+/-0.000389	8.26E-05	+/-0.00145	1.00E-05	uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pr	Dissolution Soil Prep GL-RAD-A-015	AXM6	06/24/19	1352	1890110

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241,Cm243/244 Solid High Rad "As Received"	1895766	98	(15%-125%)
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1890821	63.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1890121	109	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1890121	69.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1890118	97.2	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste
 Client Sample ID: Mini Cell A. L. floor sample
 Sample ID: 482537001

Report Date: July 17, 2019

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 17, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 482537

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1889961										
QC1204315868	482537001	DUP									
Americium-241	U	9.45E-05	U	-5.41E-05	uCi/g	N/A		N/A	AXM6	07/01/19	13:52
Cesium-137		0.0142		0.0148	uCi/g	4.06		(0%-20%)			
QC1204315869	LCS										
Americium-241	0.353			0.369	uCi/g		104	(75%-125%)		07/01/19	17:46
Cobalt-60	0.0911			0.0952	uCi/g		105	(75%-125%)			
Cesium-137	0.121			0.129	uCi/g		106	(75%-125%)			
QC1204315867	MB										
Americium-241			U	4.90E-06	uCi/g					07/01/19	09:39
Cesium-137			U	-1.15E-05	uCi/g						
Batch	1890118										
QC1204316286	482537001	DUP									
Strontium-90		0.000819		0.000876	uCi/g	6.76		(0%-20%)	JXB7	07/11/19	15:06
QC1204316288	LCS										
Strontium-90	0.00208			0.0023	uCi/g		111	(75%-125%)		07/11/19	15:06
QC1204316285	MB										
Strontium-90			U	3.94E-05	uCi/g					07/11/19	15:06
QC1204316287	482537001	MS									
Strontium-90	0.00209	0.000819		0.0032	uCi/g		114	(75%-125%)		07/11/19	15:06

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 482537

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1890121										
QC1204316295	482537001	DUP									
Uranium-232	U	1.08E-06	U	-9.85E-07	uCi/g	N/A		N/A	JXB7	07/12/19	08:10
Uranium-233/234	U	1.92E-07	U	-1.55E-08	uCi/g	N/A		N/A			
Uranium-235/236	U	1.69E-07	U	3.65E-08	uCi/g	N/A		N/A			
Uranium-238	U	-2.30E-08	U	2.34E-07	uCi/g	N/A		N/A			
QC1204316297	LCS										
Uranium-232			U	-1.05E-07	uCi/g					07/12/19	08:10
Uranium-233/234				5.22E-05	uCi/g						
Uranium-235/236				2.08E-06	uCi/g						
Uranium-238	4.88E-05			5.57E-05	uCi/g		114	(75%-125%)			
QC1204316294	MB										
Uranium-232			U	3.32E-07	uCi/g					07/12/19	08:10
Uranium-233/234			U	1.62E-07	uCi/g						
Uranium-235/236			U	7.21E-08	uCi/g						
Uranium-238			U	3.48E-07	uCi/g						
QC1204316296	482537001	MS									
Uranium-232	U	1.08E-06	U	-4.92E-07	uCi/g					07/12/19	08:10
Uranium-233/234	U	1.92E-07		4.80E-05	uCi/g						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 482537

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1890121										
Uranium-235/236	U	1.69E-07		2.35E-06	uCi/g				JXB7	07/12/19	08:10
Uranium-238	4.88E-05 U	-2.30E-08		4.48E-05	uCi/g		91.9	(75%-125%)			
Batch	1890821										
QC1204317988	482537001 DUP										
Plutonium-238		7.99E-06		7.30E-06	uCi/g	8.98		(0%-20%)	JXB7	07/11/19	13:17
Plutonium-239/240		5.87E-06		4.76E-06	uCi/g	21		(0% - 100%)			
Plutonium-242	U	9.45E-07	U	4.84E-07	uCi/g	N/A		N/A			
QC1204317990	LCS										
Plutonium-238				1.53E-06	uCi/g					07/12/19	08:31
Plutonium-239/240	3.59E-05			3.87E-05	uCi/g		108	(75%-125%)			
Plutonium-242			U	1.41E-06	uCi/g						
QC1204317987	MB										
Plutonium-238			U	4.44E-07	uCi/g					07/11/19	13:17
Plutonium-239/240			U	-5.55E-08	uCi/g						
Plutonium-242			U	2.99E-07	uCi/g						
QC1204317989	482537001 MS										
Plutonium-238		7.99E-06		9.85E-06	uCi/g					07/12/19	08:31
Plutonium-239/240	3.59E-05	5.87E-06		4.76E-05	uCi/g		116	(75%-125%)			
Plutonium-242	U	9.45E-07		3.45E-06	uCi/g						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 482537

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1895766										
QC1204329840	482537001	DUP									
Americium-241		6.65E-06		4.15E-06	uCi/g	46.4		(0% - 100%)	JXB7	07/16/19	14:09
Curium-243/244	U	-5.71E-07	U	-1.52E-07	uCi/g	N/A		N/A			
**Americium-243 Tracer	0.000213	0.000208		0.000173	uCi/g		81.4	(15%-125%)			
QC1204329842	LCS										
Americium-241	0.000176			0.000157	uCi/g		89.4	(75%-125%)		07/16/19	14:09
Curium-243/244	0.000209			0.000179	uCi/g		85.4	(75%-125%)			
**Americium-243 Tracer	0.000213			0.000195	uCi/g		91.5	(15%-125%)			
QC1204329839	MB										
Americium-241			U	-5.53E-07	uCi/g					07/16/19	14:09
Curium-243/244			U	2.53E-07	uCi/g						
**Americium-243 Tracer	0.000213			0.000232	uCi/g		109	(15%-125%)			
QC1204329841	482537001	MS									
Americium-241	0.000176	6.65E-06		0.000163	uCi/g		88.8	(75%-125%)		07/16/19	14:09
Curium-243/244	U	-5.71E-07		0.000184	uCi/g			(75%-125%)			
**Americium-243 Tracer	0.000213	0.000208		0.00015	uCi/g		70.6	(15%-125%)			

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported

GEL LABORATORIES LLC

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

QC Summary

Workorder: 482537

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
BD											
BD											
FA											
H											
J											
K											
L											
M											
M											
N/A											
NI											
ND											
NJ											
Q											
R											
U											
UI											
UJ											
UL											
X											
Y											
^											
h											

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.

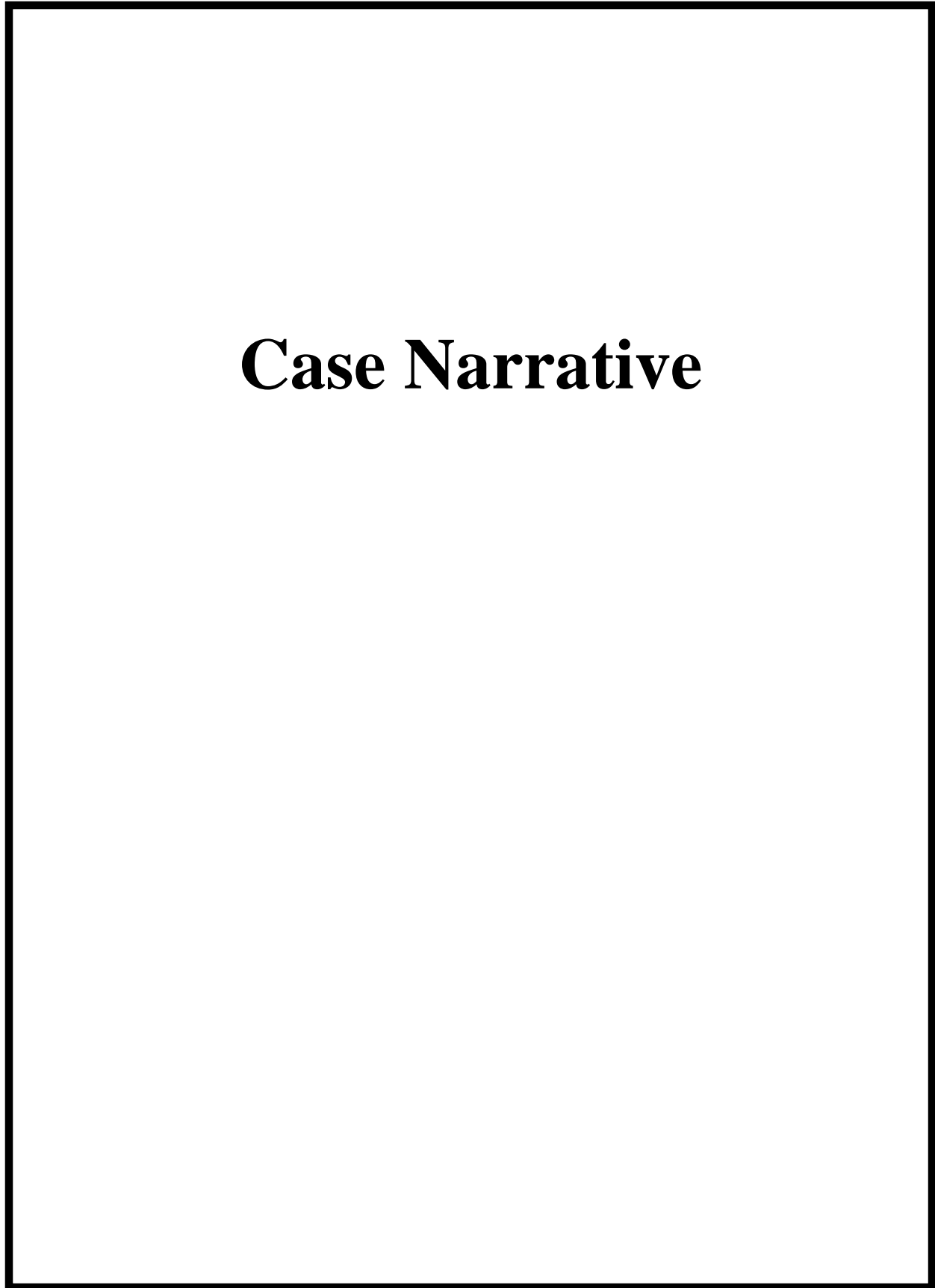
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 17 July 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122019-28
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 453-003169
Work Order #: 482537

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1890121**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1890110

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
482537001	Mini Cell A. L. floor sample
1204316294	Method Blank (MB)
1204316295	482537001(Mini Cell A. L. floor sample) Sample Duplicate (DUP)
1204316296	482537001(Mini Cell A. L. floor sample) Matrix Spike (MS)
1204316297	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204316294 (MB)	Uranium-232	Result 0.000000332 < MDA 0.00000151 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the matrix of the samples. The samples were counted the maximum count time in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
1204316295 (Mini Cell A. L. floor sampleDUP)	Uranium-232	Result -0.000000985 < MDA 0.00000214 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

482537001 (Mini Cell A. L. floor sample)	Uranium-232	Result 0.00000108 < MDA 0.00000144 > RDL 0.000001 uCi/g
--	-------------	---

Product: Alphaspec Pu242, Solid High Rad**Analytical Method:** DOE EML HASL-300, Pu-11-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1890821**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1890110

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
482537001	Mini Cell A. L. floor sample
1204317987	Method Blank (MB)
1204317988	482537001(Mini Cell A. L. floor sample) Sample Duplicate (DUP)
1204317989	482537001(Mini Cell A. L. floor sample) Matrix Spike (MS)
1204317990	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204317987 (MB)	Plutonium-238	Result 0.000000444 < MDA 0.00000241 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result -0.0000000555 < MDA 0.00000195 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.000000299 < MDA 0.00000224 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the matrix of the samples. The samples were counted the maximum count time in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
--------	---------	-------

WD:2020:0753 - Attachment B

1204317988 (Mini Cell A. L. floor sampleDUP)	Plutonium-242	Result 0.000000484 < MDA 0.00000129 > RDL 0.000001 uCi/g
482537001 (Mini Cell A. L. floor sample)	Plutonium-242	Result 0.000000945 < MDA 0.00000178 > RDL 0.000001 uCi/g

Product: Alphaspec Am241,Cm243/244 Solid High Rad**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1895766**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1890110

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

GEL Sample ID#	Client Sample Identification
482537001	Mini Cell A. L. floor sample
1204329839	Method Blank (MB)
1204329840	482537001(Mini Cell A. L. floor sample) Sample Duplicate (DUP)
1204329841	482537001(Mini Cell A. L. floor sample) Matrix Spike (MS)
1204329842	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204329839 (MB)	Curium-243/244	Result 0.000000253 < MDA 0.0000027 > RDL 0.000001 uCi/g

Samples (see below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the matrix of the samples.

Sample	Analyte	Value
---------------	----------------	--------------

WD:2020:0753 - Attachment B

1204329840 (Mini Cell A. L. floor sampleDUP)	Curium-243/244	Result -0.000000152 < MDA 0.00000303 > RDL 0.000001 uCi/g
482537001 (Mini Cell A. L. floor sample)	Curium-243/244	Result -0.000000571 < MDA 0.00000392 > RDL 0.000001 uCi/g

Technical Information**Sample Re-prep/Re-analysis**

Samples were re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1890110

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
482537001	Mini Cell A. L. floor sample

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: Gammaspec, Cs137 Only, solid High Rad

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1889961

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
482537001	Mini Cell A. L. floor sample
1204315867	Method Blank (MB)
1204315868	482537001(Mini Cell A. L. floor sample) Sample Duplicate (DUP)
1204315869	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

WD:2020:0753 - Attachment B
applicable, with the following exceptions.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204315867 (MB)	Cesium-137	Result -0.0000115 < MDA 0.0000529 > RDL 0.00001 uCi/g

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1890118

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1890110

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
482537001	Mini Cell A. L. floor sample
1204316285	Method Blank (MB)
1204316286	482537001(Mini Cell A. L. floor sample) Sample Duplicate (DUP)
1204316287	482537001(Mini Cell A. L. floor sample) Matrix Spike (MS)
1204316288	Laboratory Control Sample (LCS)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 453-003169 GEL Work Order: 482537

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

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

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

Signature:**Name: Theresa Austin****Date: 17 JUL 2019****Title: Group Leader**

This page intentionally left blank

MRR – Manipulator Repair Room

This page intentionally left blank



March 20, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 472050
SDG: 422-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 22, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

March 20, 2019

Release Number

422

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.02

Description

MRR Floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 422-003169
Work Order: 472050

March 20, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

422

Charge Number

WV01.C2.06.01.04.10.02

Summary

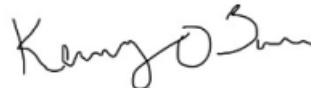
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on February 22, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
472050001	MRR Floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

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

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

472050

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL
 2. Charge #: WV01.C2.06.01.04.10.02
 5. PO #: CH-003169
 6. Release #: 422
 8. Cognizant Engineer/Project: MPPB Demo
 10. DQO/SAP#: WVDP-584

Sample ID#	Type	# Cont.	Pres.	13.	
				Date	Time
<u>MRR Floor</u>	<u>Grab</u>	<u>1</u>	<u>na</u>	<u>3-22-18</u>	<u>1000</u>

3. Analysis Requested		4. Electronic Disk? Yes [] No [X]	7. Report Format Level: I [X] II []	9. Priority Code: Routine [X]
Gamma for Cs-137 & Am-241	U alpha isotopes (232, 233/234, 235/236, 238)			
Pu alpha isotopes (Pu-238, -239/240, -242)		X		11. Report Data To: <u>W. Connors</u>

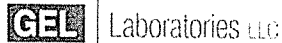
Comments
 ** The five smears are to be composited by the lab to form a composite sample and analyzed for ²⁴¹Am, ¹³⁷Cs, ²³²U, ²³³U, ²³⁴U, ²³⁵U, ²³⁶U, ²³⁸U, ²³⁹Pu, ²⁴⁰Pu, ²⁴²Pu, ⁹⁰Sr. Report units in uCi per composite sample.

Gross Wt (g)	Tare Wt (g)	Net Wt (g)	14.				
			Phase (Circle one): <u>Solid</u>	Liquid	Sludge	Other:	Other:
<u>147.7</u>	<u>105</u>	<u>42.7</u>					

15. Sample Bottle Size: 1000 ml Sample Bottle Type (Circle One): Glass
 17. Chain-of-Custody Reviewed by: Jason Wheeler
 19. Sample Custodian Signature/Date/Time
 Released by: Tom Wittmeyer 3-22-18 15:36 Received by: Jason Wheeler 3-22-18 15:36
 Released by: Jason Wheeler 2-20-19 13:07 Received by: Jason Wheeler 2/22/19 9:10
 Released by: _____ Received by: _____
 Released by: _____ Received by: _____

Gross Wt (g)	Tare Wt (g)	Net Wt (g)	16.				
			Phase (Circle one): <u>Solid</u>	Liquid	Sludge	Other:	Other:
<u>147.7</u>	<u>105</u>	<u>42.7</u>					

20. Sample Receipt:
 Temperature _____ °C
 Cooler Seals Intact? Yes [] No [X]



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>472051 472050</u>	
Received By: <u>RSO</u>		Date Received: <u>2/22/19</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>8107 1470 9830</u>	
Suspected Hazard Information		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/> Yes	Hazard Class Shipped: _____ UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/> Yes	COC notation or radioactive stickers on containers equal client designation.	
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/> Yes	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>1.5 CPM / (uR/hr)</u> Classified as: Rad 1 Rad 2 <input checked="" type="checkbox"/> Rad 3	
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/> Yes	COC notation or hazard labels on containers equal client designation.	
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/> Yes	If D or E is yes, select Hazards below. <input checked="" type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other:	
Sample Receipt Criteria		Comments/Qualifiers (Required for Non-Conforming Items)	
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/> Yes	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/> Yes	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/> Yes	Preservation Method: Wet Ice Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>17°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/> Yes	Temperature Device Serial #: <u>T24116</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/> Yes	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/> Yes	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/> Yes	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
			Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
			Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___
8	Samples received within holding time?	<input checked="" type="checkbox"/> Yes	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/> Yes	ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/> Yes	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/> Yes	Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/> Yes	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/> Yes	Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed): <u>* Both over 25 uCi/g</u>			

PM (or PMA) review: Initials AM Date 2/22/19 Page 1 of 1

Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: March 20, 2019

Client Sample ID: MRR Floor
 Sample ID: 472050001
 Matrix: Filter
 Collect Date: 22-MAR-18
 Receive Date: 22-FEB-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.0222	+/-0.000874	8.70E-05	+/-0.00378	2.00E-06	uCi/sample			AXM6	03/09/19	1045	1852253	1
Plutonium-239/240	Hh	0.036	+/-0.00111	7.95E-05	+/-0.00608	2.00E-06	uCi/sample							
Plutonium-242	Hh	0.000235	+/-9.23E-05	4.91E-05	+/-0.0001	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	Hh	0.000253	+/-1.15E-05	1.81E-06	+/-3.33E-05	2.00E-06	uCi/sample			AXM6	03/09/19	1013	1852254	2
Uranium-233/234	Hh	0.000309	+/-1.41E-05	1.57E-06	+/-4.08E-05	2.00E-06	uCi/sample							
Uranium-235/236	Hh	3.30E-05	+/-4.62E-06	9.22E-07	+/-6.17E-06	2.00E-06	uCi/sample							
Uranium-238	Hh	5.99E-05	+/-6.20E-06	1.16E-06	+/-9.66E-06	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.00225	+/-0.000519	0.000579	+/-0.000784	2.00E-06	uCi/sample			JXB7	03/11/19	1337	1856056	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.0604	+/-0.0011	0.000859	+/-0.00824		uCi/sample			JXB7	02/26/19	0749	1852244	4
Cesium-137	Hh	0.877	+/-0.00251	0.000379	+/-0.0746	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.0057	+/-0.000265	6.81E-05	+/-0.000574		uCi/sample							
Europium-154	Hh	0.00137	+/-0.00032	0.000194	+/-0.000342		uCi/sample							

*Laboratory Composite- Filters RAD III "As Received"***The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	JXB7	02/28/19	1007	1852242

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R
5	GL-RAD-A-026

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1852253	76.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1852254	576 *	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1852254	91.4	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1856056	92.7	(25%-125%)

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: March 20, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: MRR Floor

Sample ID: 472050001

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 20, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 472050

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852244										
QC1204226460	LCS										
Cobalt-60	0.00545			0.00567	uCi/sample		104	(75%-125%)	JXB7	02/26/19	15:56
Americium-241	0.0304			0.0314	uCi/sample		104	(75%-125%)			
Cesium-137	0.00961			0.0101	uCi/sample		105	(75%-125%)			
Europium-154			U	2.07E-05	uCi/sample						
QC1204226461	LCSD										
Cobalt-60	0.00545			0.00534	uCi/sample	5.98	97.9	(0%-20%)		02/26/19	17:58
Americium-241	0.0304			0.0313	uCi/sample	0.447	103	(0%-20%)			
Cesium-137	0.00961			0.00923	uCi/sample	8.79	96	(0%-20%)			
Europium-154			U	-4.05E-05	uCi/sample	0					
QC1204226459	MB										
Cobalt-60			U	2.31E-06	uCi/sample					02/26/19	15:56
Americium-241			U	1.50E-05	uCi/sample						
Cesium-137			U	5.75E-08	uCi/sample						
Europium-154			U	7.61E-06	uCi/sample						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472050

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852253										
QC1204226478	LCS										
Plutonium-238			U	4.68E-06	uCi/sample				AXM6	03/09/19	10:45
Plutonium-239/240	0.0002			0.000222	uCi/sample		111	(75%-125%)			
Plutonium-242			U	2.35E-06	uCi/sample			(75%-125%)			
QC1204226479	LCSD										
Plutonium-238			U	3.41E-06	uCi/sample	0				03/09/19	10:45
Plutonium-239/240	0.0002			0.000222	uCi/sample	0.304	111	(0%-20%)			
Plutonium-242				8.26E-06	uCi/sample	47.2					
QC1204226477	MB										
Plutonium-238			U	2.57E-06	uCi/sample					03/09/19	10:45
Plutonium-239/240			U	3.04E-06	uCi/sample						
Plutonium-242			U	2.36E-07	uCi/sample						
Batch	1852254										
QC1204226484	LCS										
Uranium-232			U	-9.32E-08	uCi/sample			(75%-125%)	AXM6	03/09/19	10:13
Uranium-233/234				4.71E-05	uCi/sample						
Uranium-235/236				3.59E-06	uCi/sample						
Uranium-238	5.45E-05			5.28E-05	uCi/sample		96.9	(75%-125%)			
QC1204226485	LCSD										
Uranium-232			U	1.38E-07	uCi/sample	0		(0%-20%)		03/09/19	10:13

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472050

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852254										
Uranium-233/234				5.84E-05	uCi/sample	21.4			AXM6	03/09/19	10:13
Uranium-235/236				3.52E-06	uCi/sample	1.89					
Uranium-238	5.45E-05			5.71E-05	uCi/sample	7.8	105	(0%-20%)			
QC1204226483	MB										
Uranium-232			U	-2.76E-07	uCi/sample					03/09/19	10:13
Uranium-233/234			U	-3.22E-07	uCi/sample						
Uranium-235/236			U	9.47E-08	uCi/sample						
Uranium-238			U	1.35E-07	uCi/sample						
Batch	1856056										
QC1204234662	LCS										
Strontium-90	0.0231			0.0247	uCi/sample		107	(75%-125%)	JXB7	03/11/19	13:37
QC1204234663	LCSD										
Strontium-90	0.0231			0.0231	uCi/sample	6.55	100	(0%-20%)		03/11/19	13:37
QC1204234661	MB										
Strontium-90			U	0.000358	uCi/sample					03/12/19	07:28

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472050

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J	Value is estimated										
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.										
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.										
M	M if above MDC and less than LLD										
M	REMP Result > MDC/CL and < RDL										
N/A	RPD or %Recovery limits do not apply.										
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
UI	Gamma Spectroscopy--Uncertain identification										
UJ	Gamma Spectroscopy--Uncertain identification										
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

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.

List of current GEL Certifications as of 20 March 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-2
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-14
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis

Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 422-003169
Work Order #: 472050

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1852253

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor
1204226477	Method Blank (MB)
1204226478	Laboratory Control Sample (LCS)
1204226479	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Aliquot Reduced

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204226477 (MB)	Plutonium-238	Result 0.00000257 < MDA 0.00000557 > RDL 0.000002 uCi/sample
	Plutonium-239/240	Result 0.00000304 < MDA 0.00000733 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

WD:2020:0753 - Attachment B

Sample	Value
472050001 (MRR Floor)	Received 22-FEB-19, out of holding 18-SEP-18

Miscellaneous Information**Manual Integration**

Manual integration of alpha spectroscopy spectra 472050001 (MRR Floor) was performed to fully separate counts in Regions of Interest which would have been biased.

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1852254**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor
1204226483	Method Blank (MB)
1204226484	Laboratory Control Sample (LCS)
1204226485	Laboratory Control Sample Duplicate (LCSD)

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**Tracer/Carrier Yield**

The U-232 traced portion of sample (See Below) has a high tracer yield recovery due to the presence of U-232 activity in the sample biasing the tracer yield high. A U-236 traced portion of the sample was run in order to compensate for the biased high tracer yield.

Sample	Analyte	Value
472050001 (MRR Floor)	Uranium-232 Tracer	576* (15%-125%)

Technical Information**Holding Time**

WD:2020:0753 - Attachment B

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472050001 (MRR Floor)	Received 22-FEB-19, out of holding 18-SEP-18

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor

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: Gammaspec, Gamma, Cs137, Filter HIGH RAD

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1852244

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor
1204226459	Method Blank (MB)
1204226460	Laboratory Control Sample (LCS)
1204226461	Laboratory Control Sample Duplicate (LCSD)

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

WD:2020:0753 - Attachment B

procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204226459 (MB)	Cesium-137	Result 0.0000000575 < MDA 0.0000234 > RDL 0.0000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472050001 (MRR Floor)	Received 22-FEB-19, out of holding 18-SEP-18

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	472050001	MRR Floor
Europium-154	472050001	MRR Floor

Product: GFPC, Sr90, filter HIGH RAD

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1856056

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor
1204234661	Method Blank (MB)
1204234662	Laboratory Control Sample (LCS)
1204234663	Laboratory Control Sample Duplicate (LCSD)

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

WD:2020:0753 - Attachment B

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.

Preparation Information

Aliquot Reduced

Aliquot was reduced due to high activity.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204234661 (MB)	Strontium-90	Result 0.000358 < MDA 0.000465 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472050001 (MRR Floor)	Received 22-FEB-19, out of holding 18-SEP-18

Recounts

Sample 1204234661 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Product: Laboratory Composite- Filters RAD III

Composite Preparation Method: GL-RAD-A-026

Composite Preparation Procedure: GL-RAD-A-026 REV# 17

Composite Preparation Batch: 1852092

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472050001	MRR Floor

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 422-003169 GEL Work Order: 472050

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

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: Spencer Collins****Date: 20 MAR 2019****Title: Analyst I**

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1852242
Analyst: Jon Burgess (JXB7)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 18-MAR-2019 **Hold:** 13-SEP-2017 **Package:** 20-MAR-2019 **SDG:** 22-M

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
------	-----------	-------------	---------------	--------------	-------------

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	472050001	28-FEB-2019		1	0	12.6414	12.6414	100	12.6414	12.6414
2	472051001	28-FEB-2019		1	0	3.1628	3.1628	100	3.1628	3.1628

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

OGC – Off-Gas Cell

This page intentionally left blank



June 13, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 480030
SDG: 443-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 23, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

June 13, 2019

Release Number

443

Purchase Order Number

CH-003169

Charge #

WV01.C2.01.04.10.02

Description

OGC Floor Stone

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 443-003169
Work Order: 480030

June 13, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

443

Charge Number

WV01.C2.01.04.10.02

Summary

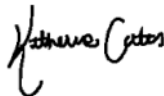
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on May 23, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
480030001	OGC Floor Stone

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Katherine Cates
Project Manager

Data Review Qualifier Definitions

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

480030

WD:2020:0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

2. Charge #: WVDP-584
6. Release #: 443

8. Cognizant Engineer/Project: MPPB Demo

10. DQO/SAP#: WVDP-584

Sample ID#	Type	# Cont.	Pres.	Date	Time	pH
<u>OGC Floor STONE</u>	<u>Grab</u>	<u>1</u>	<u>na</u>	<u>6-26-18</u>	<u>14:15</u>	<u>na</u>

3. Analysis Requested

Analysis Requested	Requested
Gamma for Cs-137 & Am-241	X
U alpha isotopes (²³² U, ²³³ U, ²³⁴ U, ²³⁵ U, ²³⁶ U, ²³⁸ U, ²³⁹ Pu, ²⁴⁰ Pu)	X
Pu alpha isotopes (²³⁸ Pu, ²³⁹ Pu, ²⁴⁰ Pu)	X
SR-90	X

4. Electronic Disk? Yes [] No [x]
7. Report Format Level: I [x] II []
9. Priority Code: Routine [x]
11. Report Data To: W. Connors

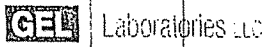
Comments: ** The five smears are to be composited by the lab to form a composite sample and analyzed for ²⁴¹Am, ¹³⁷Cs, ²³²U, ²³³U, ²³⁴U, ²³⁵U, ²³⁶U, ²³⁸U, ²³⁹Pu, ²⁴⁰Pu, ²⁴²Pu, ⁹⁰Sr. Report units in uCi per composite sample.

14. Phase (Circle one): Solid Liquid Sludge Other:
Type (Circle one): Debris Particulate Other: Smear

15. Sample Bottle Size: 1 L Sample Bottle Type (Circle One): Glass (Poly) 210 mCi Alpha NA []

17. Chain-of-Custody Reviewed by: [Signature]
19. Sample Custodian Signature/Date/Time: [Signature] 6-27-18 0830

Released by: [Signature] Received by: [Signature]
Released by: [Signature] Received by: [Signature]
Released by: [Signature] Received by: [Signature]
Released by: [Signature] Received by: [Signature]



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>480030</u>			
Received By: <u>Greg Austin</u>		Date Received: <u>5/23/19</u>			
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>81071470 9704</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.			
A) Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
B) Did the client designate the samples are to be received as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.			
C) Did the RSO classify the samples as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0.4</u> CPM / (mR/hr) Classified as: Rad 1 <u>Rad 2</u> <u>Rad 3</u> <u>See below</u>			
D) Did the client designate samples are hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COC notation or hazard labels on containers equal client designation.			
E) Did the RSO identify possible hazards?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:			
Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <u>Ice Packs</u> Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>4°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR2-19</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA (If yes, take to VOA Freezer)
					Do liquid VOA vials contain acid preservation? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA (If unknown, select No)
					Are liquid VOA vials free of headspace? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: <u>WV 512519</u>
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed): <u>Release 443 = Rad 3</u> <u>Releases 455 and 456 = Rad 2's</u> <u>Greg Austin 5/23/19</u>					

PM (or PMA) review: Initials WV Date 5/23 Page 1 of 1

Certificates of Analysis

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799

Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: June 13, 2019

Client Sample ID: OGC Floor Stone
 Sample ID: 480030001
 Matrix: Misc Solid
 Collect Date: 26-JUN-18
 Receive Date: 23-MAY-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238	Hh	8.46E-05	+/-2.59E-05	1.92E-05	+/-2.99E-05	1.00E-06	uCi/g			JXB7	06/10/19	0908	1880188	1
Plutonium-239/240	Hh	0.000186	+/-3.64E-05	1.39E-05	+/-4.89E-05	1.00E-06	uCi/g							
Plutonium-242	HUh	3.23E-06	+/-7.34E-06	1.26E-05	+/-7.36E-06	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	HUh	-9.52E-07	+/-3.22E-06	8.36E-06	+/-3.22E-06	1.00E-06	uCi/g			JXB7	06/07/19	0852	1880187	2
Uranium-233/234	HUh	1.66E-06	+/-3.53E-06	5.86E-06	+/-3.54E-06	1.00E-06	uCi/g							
Uranium-235/236	HUh	2.28E-06	+/-4.07E-06	6.60E-06	+/-4.08E-06	1.00E-06	uCi/g							
Uranium-238	HUh	3.20E-07	+/-3.78E-06	7.97E-06	+/-3.78E-06	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90	Hh	0.000664	+/-4.04E-05	2.21E-05	+/-0.000131	1.00E-04	uCi/g			JXB7	06/06/19	1643	1880190	3
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	H	0.000421	+/-2.79E-05	2.03E-05	+/-5.19E-05		uCi/g			AXM6	06/06/19	0604	1880186	4
Cesium-137	H	0.00947	+/-4.84E-05	6.03E-06	+/-0.000845	1.00E-05	uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pre	Dissolution Soil Prep GL-RAD-A-015	JXB7	05/30/19	1525	1880185

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1880188	57	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1880187	96.8	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1880187	90.7	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1880190	99.4	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: June 13, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: OGC Floor Stone
 Sample ID: 480030001

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 13, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 480030

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1880186										
QC1204291755	480030001	DUP									
Americium-241	H	0.000421	H	0.000384	uCi/g	9.18		(0%-20%)	AXM6	06/06/19	08:21
Cesium-137	H	0.00947	H	0.0098	uCi/g	3.47		(0%-20%)			
QC1204291756	LCS										
Americium-241	0.00181			0.0018	uCi/g		99.9	(75%-125%)		06/06/19	08:13
Cobalt-60	0.000314			0.000303	uCi/g		96.5	(75%-125%)			
Cesium-137	0.000569			0.000565	uCi/g		99.4	(75%-125%)			
QC1204291754	MB										
Americium-241			U	2.40E-06	uCi/g					06/06/19	08:10
Cesium-137			U	-6.79E-08	uCi/g						
Batch	1880187										
QC1204291758	480030001	DUP									
Uranium-232	HUh	-9.52E-07	HU	-7.15E-07	uCi/g	N/A		N/A	JXB7	06/07/19	08:52
Uranium-233/234	HUh	1.66E-06	HU	1.65E-07	uCi/g	N/A		N/A			
Uranium-235/236	HUh	2.28E-06	HU	2.06E-06	uCi/g	N/A		N/A			
Uranium-238	HUh	3.20E-07	HU	2.94E-06	uCi/g	N/A		N/A			
QC1204291760	LCS										
Uranium-232			U	-3.99E-06	uCi/g					06/07/19	08:52

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 480030

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1880187										
Uranium-233/234				0.000384	uCi/g				JXB7	06/07/19	08:52
Uranium-235/236				2.63E-05	uCi/g						
Uranium-238	0.000425			0.000415	uCi/g		97.5	(75%-125%)			
QC1204291757	MB										
Uranium-232			U	7.18E-06	uCi/g					06/07/19	08:52
Uranium-233/234			U	2.68E-06	uCi/g						
Uranium-235/236			U	2.13E-06	uCi/g						
Uranium-238			U	2.68E-06	uCi/g						
QC1204291759	480030001	MS									
Uranium-232		HUh	-9.52E-07	HU	3.82E-06	uCi/g				06/07/19	08:52
Uranium-233/234		HUh	1.66E-06	H	0.000446	uCi/g					
Uranium-235/236		HUh	2.28E-06	H	3.27E-05	uCi/g					
Uranium-238	0.000425	HUh	3.20E-07	H	0.000436	uCi/g		102	(75%-125%)		
Batch	1880188										
QC1204291762	480030001	DUP									
Plutonium-238		Hh	8.46E-05	H	7.45E-05	uCi/g	12.7	(0%-20%)	JXB7	06/10/19	09:08
Plutonium-239/240		Hh	0.000186	H	0.000199	uCi/g	6.72	(0%-20%)			
Plutonium-242		HUh	3.23E-06	H	8.50E-06	uCi/g	38.9	(0% - 100%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 480030

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1880188										
QC1204291764	LCS										
Plutonium-238				6.59E-06	uCi/g				JXB7	06/10/19	09:39
Plutonium-239/240	0.000313			0.000367	uCi/g		117	(75%-125%)			
Plutonium-242			U	6.12E-06	uCi/g						
QC1204291761	MB										
Plutonium-238			U	1.48E-06	uCi/g					06/12/19	10:49
Plutonium-239/240			U	1.40E-06	uCi/g						
Plutonium-242			U	-2.04E-06	uCi/g						
QC1204291763	480030001	MS									
Plutonium-238		Hh	8.46E-05	H	6.96E-05	uCi/g				06/12/19	10:49
Plutonium-239/240	0.000313	Hh	0.000186	H	0.000563	uCi/g		121	(75%-125%)		
Plutonium-242		HUh	3.23E-06	HU	4.02E-06	uCi/g					
Batch	1880190										
QC1204291769	480030001	DUP									
Strontium-90		Hh	0.000664	H	0.000636	uCi/g	4.29	(0%-20%)	JXB7	06/06/19	16:43
QC1204291771	LCS										
Strontium-90	0.00364				0.00414	uCi/g		114	(75%-125%)	06/06/19	16:43
QC1204291768	MB										
Strontium-90			U	-1.07E-05	uCi/g					06/06/19	16:43
QC1204291770	480030001	MS									
Strontium-90	0.00372	Hh	0.000664	H	0.00451	uCi/g		103	(75%-125%)	06/06/19	16:43

GEL LABORATORIES LLC

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

QC Summary

Workorder: 480030

Page 4 of 4

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

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- UL Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Other specific qualifiers were required to properly define the results. Consult case narrative.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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.

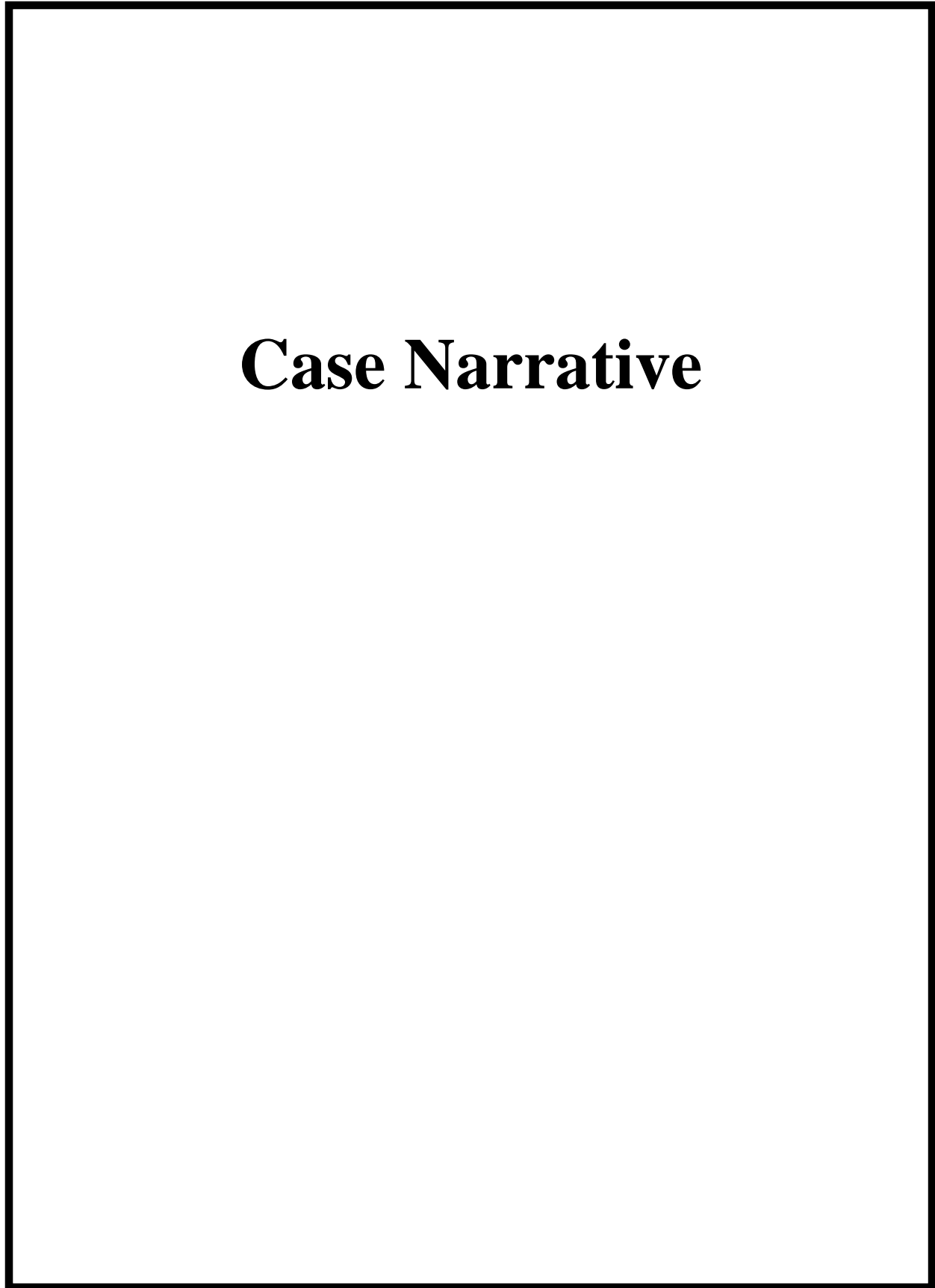
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 13 June 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 443-003169
Work Order #: 480030

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1880187**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1880185

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
480030001	OGC Floor Stone
1204291757	Method Blank (MB)
1204291758	480030001(OGC Floor Stone) Sample Duplicate (DUP)
1204291759	480030001(OGC Floor Stone) Matrix Spike (MS)
1204291760	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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204291757 (MB)	Uranium-232	Result 0.00000718 < MDA 0.0000142 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.00000268 < MDA 0.00000589 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.00000213 < MDA 0.0000032 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000268 < MDA 0.00000589 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
--------	---------	-------

WD:2020:0753 - Attachment B

1204291758 (OGC Floor StoneDUP)	Uranium-232	Result -0.000000715 < MDA 0.0000119 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.000000165 < MDA 0.00000769 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.00000206 < MDA 0.00000561 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000294 < MDA 0.00000647 > RDL 0.000001 uCi/g
480030001 (OGC Floor Stone)	Uranium-232	Result -0.000000952 < MDA 0.00000836 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.00000166 < MDA 0.00000586 > RDL 0.000001 uCi/g
	Uranium-235/236	Result 0.00000228 < MDA 0.0000066 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000032 < MDA 0.00000797 > RDL 0.000001 uCi/g

Technical Information**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204291758 (OGC Floor StoneDUP)	Received 23-MAY-19, out of holding 23-DEC-18
1204291759 (OGC Floor StoneMS)	Received 23-MAY-19, out of holding 23-DEC-18
480030001 (OGC Floor Stone)	Received 23-MAY-19, out of holding 23-DEC-18

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1880188

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1880185

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
480030001	OGC Floor Stone
1204291761	Method Blank (MB)
1204291762	480030001(OGC Floor Stone) Sample Duplicate (DUP)

WD:2020:0753 - Attachment B

1204291763 480030001(OGC Floor Stone) Matrix Spike (MS)

1204291764 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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204291761 (MB)	Plutonium-238	Result 0.00000148 < MDA 0.0000237 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000014 < MDA 0.0000123 > RDL 0.000001 uCi/g
	Plutonium-242	Result -0.00000204 < MDA 0.0000147 > RDL 0.000001 uCi/g

The following detection limit was not achieved due to high sample activity.

Sample	Analyte	Value
480030001 (OGC Floor Stone)	Plutonium-242	Result 0.00000323 < MDA 0.0000126 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204291762 (OGC Floor StoneDUP)	Received 23-MAY-19, out of holding 23-DEC-18
1204291763 (OGC Floor StoneMS)	Received 23-MAY-19, out of holding 23-DEC-18
480030001 (OGC Floor Stone)	Received 23-MAY-19, out of holding 23-DEC-18

Recounts

Sample 1204291763 (OGC Floor StoneMS) was recounted due to high recovery. The recount is reported.
Sample 1204291761 (MB) was recounted due to a suspected false positive. The recount is reported.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1880185

WD:2020:0753 - Attachment B

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
480030001	OGC Floor Stone

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

Holding Time

Samples were received and analyzed outside the hold time.

Product: Gammaspec, Cs137 Only, solid High Rad

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1880186

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
480030001	OGC Floor Stone
1204291754	Method Blank (MB)
1204291755	480030001(OGC Floor Stone) Sample Duplicate (DUP)
1204291756	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

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204291755 (OGC Floor StoneDUP)	Received 23-MAY-19, out of holding 23-DEC-18
480030001 (OGC Floor Stone)	Received 23-MAY-19, out of holding 23-DEC-18

WD:2020:0753 - Attachment B

Product: GFPC, Sr90, solid High Rad**Analytical Method:** EPA 905.0 Modified/DOE RP501 Rev. 1 Modified**Analytical Procedure:** GL-RAD-A-004 REV# 21**Analytical Batch:** 1880190**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1880185

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
480030001	OGC Floor Stone
1204291768	Method Blank (MB)
1204291769	480030001(OGC Floor Stone) Sample Duplicate (DUP)
1204291770	480030001(OGC Floor Stone) Matrix Spike (MS)
1204291771	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**Holding Time**

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204291769 (OGC Floor StoneDUP)	Received 23-MAY-19, out of holding 23-DEC-18
1204291770 (OGC Floor StoneMS)	Received 23-MAY-19, out of holding 23-DEC-18
480030001 (OGC Floor Stone)	Received 23-MAY-19, out of holding 23-DEC-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 443-003169 GEL Work Order: 480030


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Theresa Austin**Date:** 18 JUN 2019**Title:** Group Leader

Prep Logbook

Digestion for Soil

Batch ID: 1880185
Analyst: Jon Burgess (JXB7)
Method: Client Requested Procedure
Lab SOP: GL-RAD-A-015 REV# 18
Instrument: R2-38110047

Due Dates for Lab: 16-JUN-2019 **Hold:** 23-DEC-2018 **Package:** 18-JUN-2019 **SDG:** 20-JUN

Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1	480030001	30-MAY-2019		0.6406	100	156.10365

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

This page intentionally left blank

RER – Ram Equipment Room

This page intentionally left blank



May 03, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 476212
SDG: 445-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 11, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

May 3, 2019

Release Number

445

Purchase Order Number

CH-003169

Charge #

WV01.02.06.01.04.10.01

Description

RER Floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 445-003169
Work Order: 476212

May 03, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

445

Charge Number

WV01.02.06.01.04.10.01

Summary

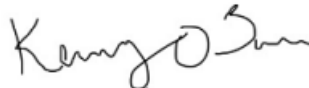
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 11, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
476212001	RER Floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

476212

WD:2020-0753 - Attachment B

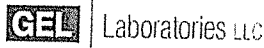
Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL	2. Charge #: WV01.02.06.01.04.10.01	3. Analysis Requested		4. Electronic Disk? Yes [] No [x]
5. PO #: CH-003169	6. Release #: 445	U alpha isotopes (238, 232, 233/234, 235/236, -)	Pu alpha isotopes (Pu-238, -239/240, -242)	7. Report Format Level: I [x] II []
8. Cognizant Engineer/Project: MPPB Demo		Gamma for Cs-137 & Am-241		9. Priority Code: Routine [x]
10. DQO/SAP#: WVDP-584				11. Report Data To: W. Connors
12.		13.		Comments
Sample ID#	Type	# Cont.	Pres.	Date
RER Floor	Grab	1	na	3-28-18
				Time
				10:00
				pH
				na

18. Gross Wt (g)	142.3	Phase (Circle one): Solid	Liquid	Sludge	Other:
Tare Wt (g)	103.8	Type (Circle one):	Debris	Coupon	Pipe Section
Net Wt (g)	38.5	Sample Bottle Size: 1650 mL	Sample Bottle Type (Circle One):	Glass	Particulate

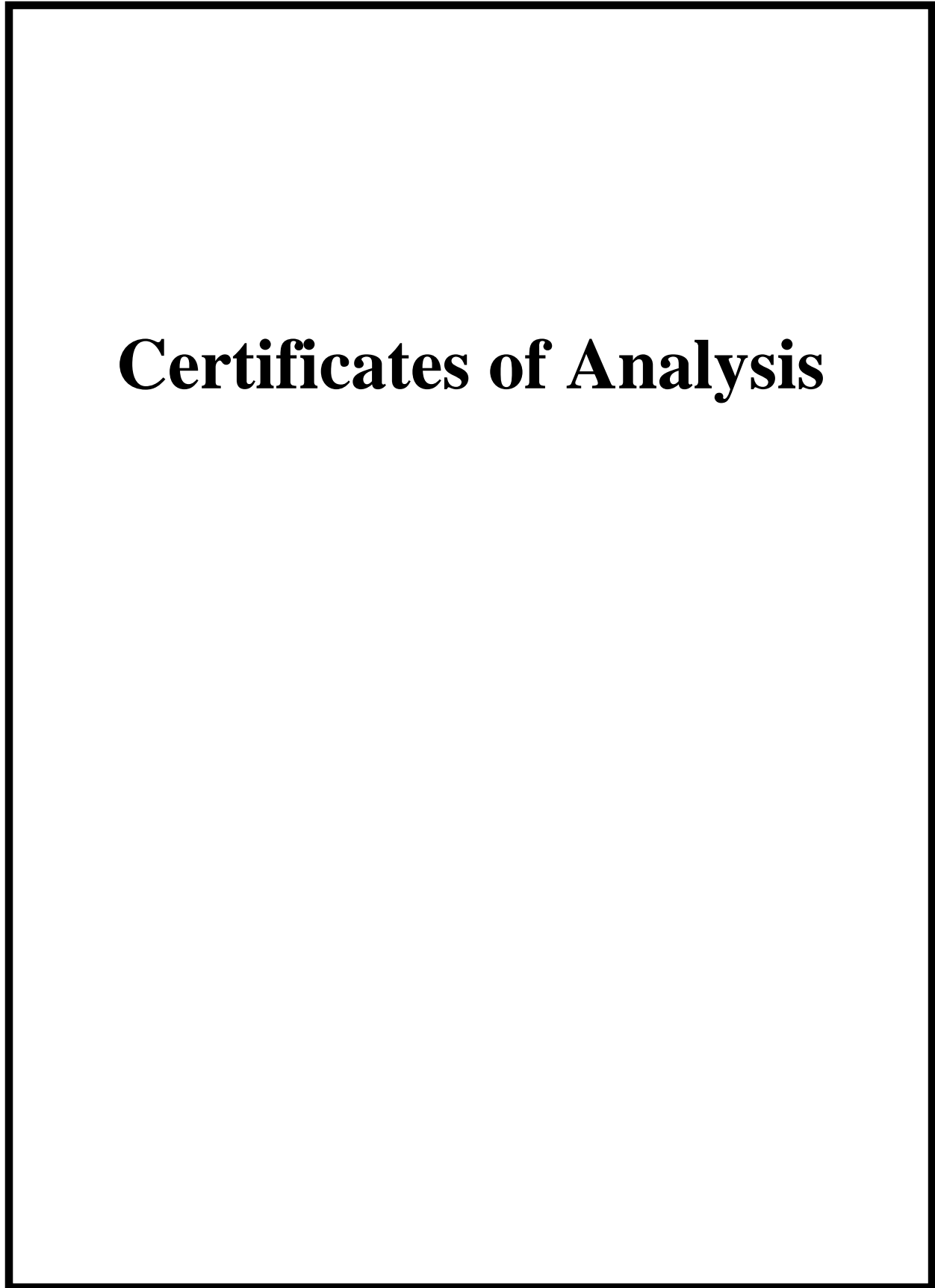
17. Chain-of-Custody Reviewed by: <i>[Signature]</i>	16. <10 mCi/Alpha NA []
19. Sample Custodian Signature/Date/Time: <i>[Signature]</i>	20. Sample Receipt:
Released by: <i>C. Ottavio</i> 3-28-18 / 1310	Temperature 26 °C
Released by: <i>Paul Neelon</i> 4.19.18 13:06	Cooler Seals Intact? Yes [x] No []
Released by: <i>[Signature]</i>	
Received by: <i>[Signature]</i>	
Received by: <i>[Signature]</i>	



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>476212 / 476214</u>			
Received By: <u>Greg Austin</u>		Date Received: <u>4/11/19</u>			
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>81071470 9760</u>			
Suspected Hazard Information		Yes	No		
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.					
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.			
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>3000</u> <input checked="" type="checkbox"/> CPM/mR/Hr Classified as: Rad 1 <input type="checkbox"/> Rad 2 <input checked="" type="checkbox"/> Rad 3 <input type="checkbox"/>			
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.			
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:			
Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: *all temperatures are recorded in Celsius TEMP: <u>20°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>283-18</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> (If yes, take to VOA Freezer)
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Do liquid VOA vials contain acid preservation? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> (If unknown, select No)
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Are liquid VOA vials free of headspace? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed):					

PM (or PMA) review: Initials WV Date 4/12 Page 1 of 1



Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: May 3, 2019

Client Sample ID: RER Floor
 Sample ID: 476212001
 Matrix: Misc Solid
 Collect Date: 28-MAR-18
 Receive Date: 11-APR-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238	Hh	0.000117	+/-8.76E-05	9.30E-05	+/-8.95E-05	1.00E-06	uCi/g			JXB7	04/24/19	0835	1870155	1
Plutonium-239/240	Hh	0.000199	+/-0.000115	0.000121	+/-0.000119	1.00E-06	uCi/g							
Plutonium-242	HUh	2.73E-05	+/-6.05E-05	0.000106	+/-6.07E-05	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	HUh	-0.000124	+/-6.56E-05	0.000212	+/-6.57E-05	1.00E-06	uCi/g			JXB7	04/18/19	1601	1864678	2
Uranium-233/234	HUh	2.92E-05	+/-4.85E-05	7.57E-05	+/-4.88E-05	1.00E-06	uCi/g							
Uranium-235/236	Hh	6.50E-05	+/-5.64E-05	3.25E-05	+/-5.75E-05	1.00E-06	uCi/g							
Uranium-238	HUh	3.59E-05	+/-5.38E-05	8.37E-05	+/-5.42E-05	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90	Hh	0.00143	+/-0.000179	5.71E-05	+/-0.000316	1.00E-04	uCi/g			JXB7	04/19/19	0727	1864681	3
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	H	0.000167	+/-2.93E-05	2.76E-05	+/-3.49E-05		uCi/g			AXM6	04/22/19	1002	1866818	4
Cesium-137	H	0.042	+/-5.17E-05	5.96E-06	+/-0.00382	1.00E-05	uCi/g							
Cobalt-58	H	0.000106	+/-3.48E-05	3.03E-05	+/-3.63E-05	0.100	uCi/g							
Cobalt-60	H	5.31E-06	+/-9.01E-07	5.14E-07	+/-1.04E-06		uCi/g							
Niobium-95	H	0.000181	+/-5.28E-05	4.83E-05	+/-5.56E-05	0.050	uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pr	Dissolution Soil Prep GL-RAD-A-015	AXM6	04/12/19	1415	1866819

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1870155	76.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	95	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	72.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1864681	104	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: May 3, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: RER Floor

Sample ID: 476212001

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 3, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 476212

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
QC1204254055	474903001	DUP									
Uranium-232	Hh	0.000279	H	0.000412	uCi/g	38.5		(0% - 100%)	JXB7	04/23/19	22:19
Uranium-233/234	Hh	0.000573	H	0.000834	uCi/g	37.1*		(0%-20%)			
Uranium-235/236	HUh	2.40E-05	H	7.87E-05	uCi/g	74.6		(0% - 100%)			
Uranium-238	HUh	6.02E-05	HU	8.86E-05	uCi/g	N/A		N/A			
QC1204254057	LCS										
Uranium-232			U	3.77E-05	uCi/g					04/18/19	23:20
Uranium-233/234				0.00329	uCi/g						
Uranium-235/236				0.000262	uCi/g						
Uranium-238	0.00359			0.00359	uCi/g		100	(75%-125%)			
QC1204254054	MB										
Uranium-232			U	4.35E-05	uCi/g					04/18/19	16:01
Uranium-233/234			U	6.24E-07	uCi/g						
Uranium-235/236			U	4.96E-06	uCi/g						
Uranium-238			U	9.53E-06	uCi/g						
QC1204254056	474903001	MS									
Uranium-232	Hh	0.000279	H	0.000269	uCi/g					04/23/19	22:19

WD:2020:0753 - Attachment B

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

QC Summary

Workorder: 476212

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
Uranium-233/234	Hh	0.000573	H	0.00391	uCi/g				JXB7	04/23/19	22:19
Uranium-235/236	HUh	2.40E-05	H	0.000196	uCi/g						
Uranium-238	0.00359 HUh	6.02E-05	H	0.00311	uCi/g		84.9	(75%-125%)			
Batch	1864681										
QC1204254061	474903001	DUP									
Strontium-90	Hh	0.141	H	0.124	uCi/g	12.7		(0%-20%)	JXB7	04/19/19	07:28
QC1204254063	LCS										
Strontium-90	0.00302			0.00258	uCi/g		85.4	(75%-125%)		04/19/19	07:28
QC1204254060	MB										
Strontium-90			U	3.13E-05	uCi/g					04/19/19	07:28
QC1204254062	474903001	MS									
Strontium-90	0.00317 Hh	0.141	H	0.129	uCi/g		N/A	(75%-125%)		04/19/19	07:28
Batch	1866818										
QC1204259093	476212001	DUP									
Americium-241	H	0.000167	H	0.000153	uCi/g	8.51		(0%-20%)	AXM6	04/19/19	10:49
Cobalt-60	H	5.31E-06	H	5.51E-06	uCi/g	3.74		(0%-20%)			
Cesium-137	H	0.042	H	0.0474	uCi/g	12.1		(0%-20%)			
Cobalt-58	H	0.000106	H	0.000163	uCi/g	42.3		(0% - 100%)			
Niobium-95	H	0.000181	HU	0.000144	uCi/g	9.78		(0% - 100%)			
QC1204259094	LCS										
Americium-241	0.00346			0.00367	uCi/g		106	(75%-125%)		04/19/19	10:50

WD:2020:0753 - Attachment B

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

QC Summary

Workorder: 476212

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1866818										
Cobalt-60	0.00105			0.00118	uCi/g		112	(75%-125%)	AXM6	04/19/19	10:50
Cesium-137	0.00131			0.00148	uCi/g		113	(75%-125%)			
Cobalt-58			U	-1.06E-06	uCi/g						
Niobium-95			U	-1.06E-06	uCi/g						
QC1204259092	MB										
Americium-241			U	3.81E-07	uCi/g					04/19/19	08:14
Cobalt-60			U	4.04E-08	uCi/g						
Cesium-137			U	8.17E-09	uCi/g						
Cobalt-58			U	-3.85E-09	uCi/g						
Niobium-95			U	1.64E-07	uCi/g						
Batch	1870155										
QC1204266874	476212001 DUP										
Plutonium-238		Hh	0.000117	HU	8.83E-05	uCi/g	22.2	(0% - 100%)	JXB7	04/24/19	08:35
Plutonium-239/240		Hh	0.000199	H	0.000136	uCi/g	37.7	(0% - 100%)			
Plutonium-242		HUh	2.73E-05	HU	2.25E-05	uCi/g	N/A		N/A		
QC1204266876	LCS										
Plutonium-238			U	3.53E-05	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352			0.00376	uCi/g		107	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476212

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1870155										
Plutonium-242			U	6.30E-05	uCi/g				JXB7	04/23/19	20:22
QC1204266873	MB										
Plutonium-238			U	2.82E-05	uCi/g					04/24/19	08:35
Plutonium-239/240			U	3.26E-05	uCi/g						
Plutonium-242			U	3.65E-05	uCi/g						
QC1204266875	476212001 MS										
Plutonium-238		Hh	0.000117	H	0.000136	uCi/g				04/23/19	20:22
Plutonium-239/240	0.00352	Hh	0.000199	H	0.00405	uCi/g		110 (75%-125%)			
Plutonium-242		HUh	2.73E-05	HU	5.31E-05	uCi/g					

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- NI See case narrative
- ND Analyte concentration is not detected above the detection limit

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476212

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
UI	Gamma Spectroscopy--Uncertain identification										
UJ	Gamma Spectroscopy--Uncertain identification										
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

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.

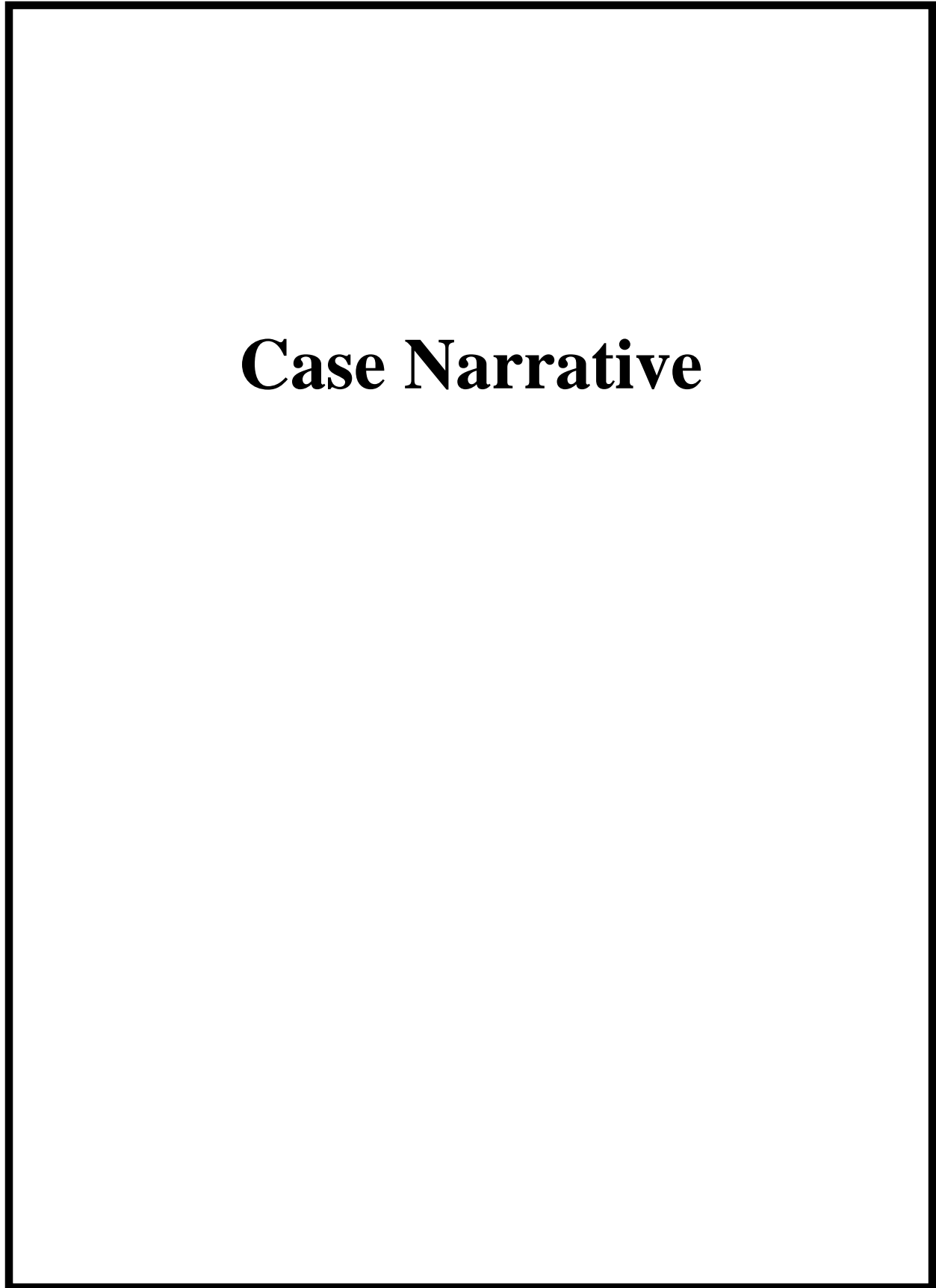
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 03 May 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 445-003169
Work Order #: 476212

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1864678**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor
1204254054	Method Blank (MB)
1204254055	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254056	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254057	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**Duplication Criteria between QC Sample and Duplicate Sample**

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-233/234	RPD 37.1* (0.00%-20.00%) RER 1.38 (0-3)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254054 (MB)	Uranium-232	Result 0.0000435 < MDA 0.000147 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.000000624 < MDA 0.0000713 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Uranium-235/236	Result 0.00000496 < MDA 0.0000654 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000953 < MDA 0.0000713 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-238	Result 0.0000886 < MDA 0.000109 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Uranium-232	Result -0.000124 < MDA 0.000212 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.0000292 < MDA 0.0000757 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.0000359 < MDA 0.0000837 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204254055 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254056 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Negative > 3 sigma TPU

The result was more negative than the three sigma TPU. The background control chart was examined and the detector was determined to be fully functional.

Sample	Analyte	Value
476212001 (RER Floor)	Uranium-232	Negative Result > 3 sigma value

Recounts

The U-232 and U-236 traced portions of samples 1204254055 (XC-2 Floor DebrisDUP) and 1204254056 (XC-2 Floor DebrisMS) were given additional clean-up steps and recounted in order to remove suspected Plutonium interference. The recounts are being reported.

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

WD:2020:0753 - Attachment B

Analytical Batch: 1870155**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1866819

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

GEL Sample ID#	Client Sample Identification
476212001	RER Floor
1204266873	Method Blank (MB)
1204266874	476212001(RER Floor) Sample Duplicate (DUP)
1204266875	476212001(RER Floor) Matrix Spike (MS)
1204266876	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.

Preparation Information**Aliquot Reduced**

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204266873 (MB)	Plutonium-238	Result 0.0000282 < MDA 0.0000767 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000326 < MDA 0.000105 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000365 < MDA 0.0000977 > RDL 0.000001 uCi/g
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Plutonium-242	Result 0.0000273 < MDA 0.000106 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Plutonium-242	Result 0.0000273 < MDA 0.000106 > RDL 0.000001 uCi/g

Technical Information**Holding Time**

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204266874 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
1204266875 (RER FloorMS)	Received 11-APR-19, out of holding 24-SEP-18
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Sample Re-prep/Re-analysis

Samples were reprep due to high activity. The reanalysis is being reported.

Recounts

Samples 1204266873 (MB), 1204266874 (RER FloorDUP) and 476212001 (RER Floor) were recounted due to high MDCs. The recounts are reported.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor

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**Holding Time**

Samples were received and analyzed outside the hold time.

Product: Gammaspec, Cs137 Only, solid High Rad

WD:2020:0753 - Attachment B

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1866818

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor
1204259092	Method Blank (MB)
1204259093	476212001(RER Floor) Sample Duplicate (DUP)
1204259094	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

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204259093 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Recounts

Sample 476212001 (RER Floor) was recounted to verify sample results. Recount is reported.

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-58	476212001	RER Floor
Cobalt-60	476212001	RER Floor
Niobium-95	476212001	RER Floor

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1864681

Preparation Method: Client Requested Procedure

WD:2020:0753 - Attachment B

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

GEL Sample ID#	Client Sample Identification
476212001	RER Floor
1204254060	Method Blank (MB)
1204254061	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254062	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254063	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

Matrix Spike (MS) Recovery

The Matrix Spike (See Below) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

Sample	Analyte	Value
1204254062 (XC-2 Floor DebrisMS)	Strontium-90	-399* (75%-125%), but result > 5x nominal

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204254061 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254062 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 445-003169 GEL Work Order: 476212

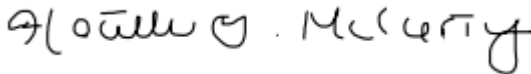
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Heather McCarty**Date:** 03 MAY 2019**Title:** Analyst II



May 03, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 476212
SDG: 445-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 11, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

May 3, 2019

Release Number

445

Purchase Order Number

CH-003169

Charge #

WV01.02.06.01.04.10.01

Description

RER Floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 445-003169
Work Order: 476212

May 03, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

445

Charge Number

WV01.02.06.01.04.10.01

Summary

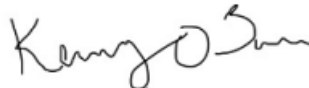
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 11, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
476212001	RER Floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

Data Review Qualifier Definitions

Qualifier Explanation

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

476212

WD:2020-0753 - Attachment B

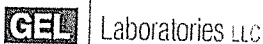
Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab: GEL	2. Charge #: WV01.02.06.01.04.10.01	3. Analysis Requested		4. Electronic Disk? Yes [] No [x]
5. PO #: CH-003169	6. Release #: 445	U alpha isotopes (232, 233/234, 235/236, 238)	Pu alpha isotopes (Pu-238, -239/240, -242)	7. Report Format Level: I [x] II []
8. Cognizant Engineer/Project: MPPB Demo		Gamma for Cs-137 & Am-241		9. Priority Code: Routine [x]
10. DQO/SAP#: WVDP-584				11. Report Data To: W. Connors
12.		13.		Comments
Sample ID#	Type	# Cont.	Pres.	Date
RER Floor	Grab	1	na	3-28-18
				Time
				10:00
				na
				pH

18. Gross Wt (g)	142.3	Phase (Circle one): Solid	Liquid	Sludge	Other:
Tare Wt (g)	103.8	Type (Circle one):	Debris	Coupon	Pipe Section
Net Wt (g)	38.5	Sample Bottle Size: 1650 mL	Sample Bottle Type (Circle One):	Glass	Particulate

17. Chain-of-Custody Reviewed by: <i>[Signature]</i>	16. 210 mCi/Alpha NA []
19. Sample Custodian Signature/Date/Time: <i>[Signature]</i>	20. Sample Receipt:
Released by: C. Ottavio 3-28-18 / 1310	Temperature 26 °C
Released by: Paul Neelon 4.10.19 13:06	Cooler Seals Intact? Yes [x] No []
Released by: <i>[Signature]</i>	
Released by: <i>[Signature]</i>	



SAMPLE RECEIPT & REVIEW FORM

Client: WVNS SDG/AR/COC/Work Order: 476212 / 476214

Received By: Greg Austin Date Received: 4/11/19

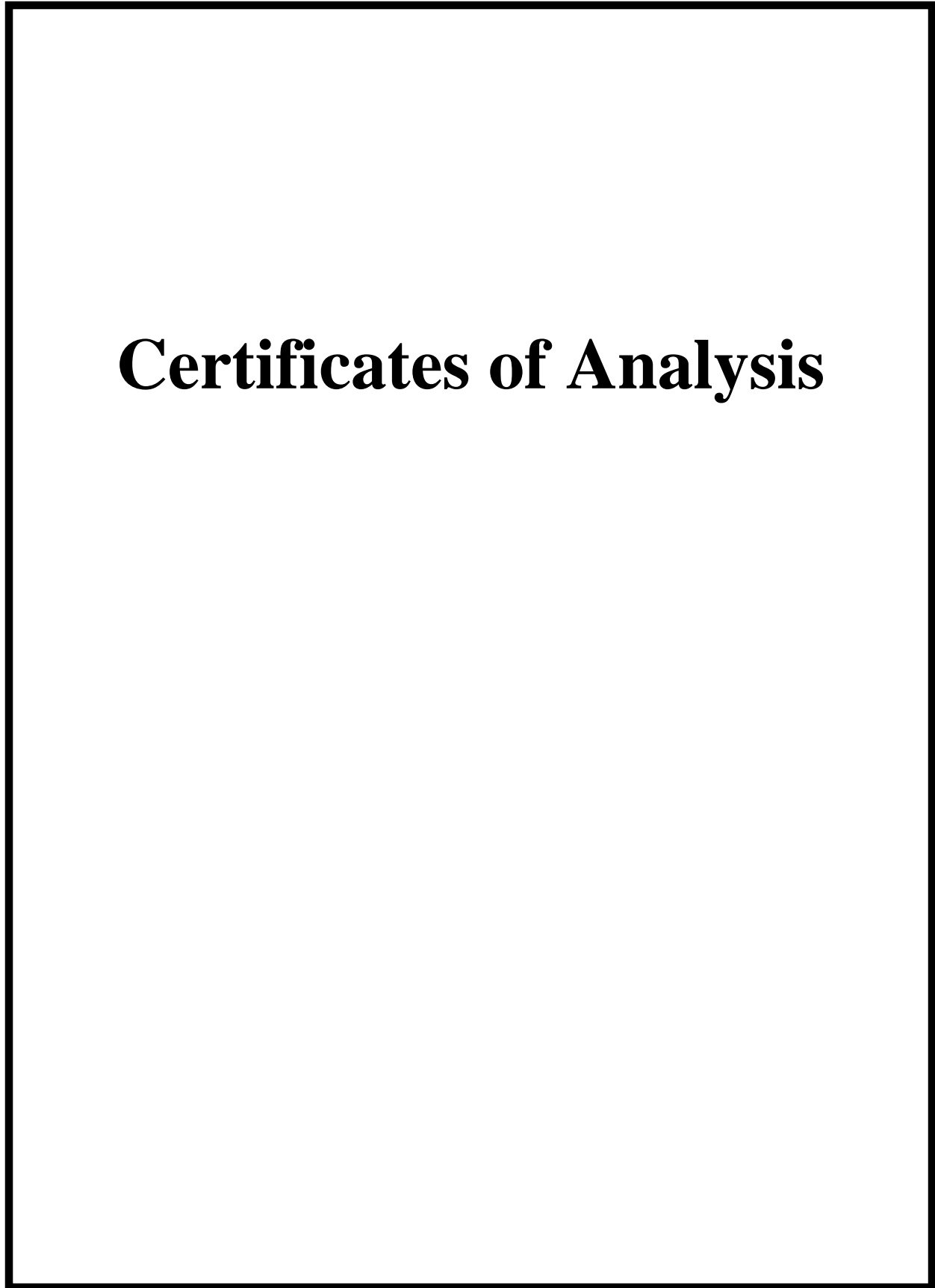
Carrier and Tracking Number: FedEx Express (circled) 810714709760

Table with 2 columns: Suspected Hazard Information (Yes/No) and details. Includes rows for DOT Hazardous, client designation, RSO classification, and possible hazards.

Table with 4 columns: Sample Receipt Criteria, Yes, NA, No, and Comments/Qualifiers. Contains 13 rows of criteria such as shipping containers, custody documents, and sample ID matching.

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials WA Date 4/12 Page 1 of 1



Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: May 3, 2019

Client Sample ID: RER Floor
 Sample ID: 476212001
 Matrix: Misc Solid
 Collect Date: 28-MAR-18
 Receive Date: 11-APR-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238	Hh	0.000117	+/-8.76E-05	9.30E-05	+/-8.95E-05	1.00E-06	uCi/g			JXB7	04/24/19	0835	1870155	1
Plutonium-239/240	Hh	0.000199	+/-0.000115	0.000121	+/-0.000119	1.00E-06	uCi/g							
Plutonium-242	HUh	2.73E-05	+/-6.05E-05	0.000106	+/-6.07E-05	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	HUh	-0.000124	+/-6.56E-05	0.000212	+/-6.57E-05	1.00E-06	uCi/g			JXB7	04/18/19	1601	1864678	2
Uranium-233/234	HUh	2.92E-05	+/-4.85E-05	7.57E-05	+/-4.88E-05	1.00E-06	uCi/g							
Uranium-235/236	Hh	6.50E-05	+/-5.64E-05	3.25E-05	+/-5.75E-05	1.00E-06	uCi/g							
Uranium-238	HUh	3.59E-05	+/-5.38E-05	8.37E-05	+/-5.42E-05	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90	Hh	0.00143	+/-0.000179	5.71E-05	+/-0.000316	1.00E-04	uCi/g			JXB7	04/19/19	0727	1864681	3
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	H	0.000167	+/-2.93E-05	2.76E-05	+/-3.49E-05		uCi/g			AXM6	04/22/19	1002	1866818	4
Cesium-137	H	0.042	+/-5.17E-05	5.96E-06	+/-0.00382	1.00E-05	uCi/g							
Cobalt-58	H	0.000106	+/-3.48E-05	3.03E-05	+/-3.63E-05	0.100	uCi/g							
Cobalt-60	H	5.31E-06	+/-9.01E-07	5.14E-07	+/-1.04E-06		uCi/g							
Niobium-95	H	0.000181	+/-5.28E-05	4.83E-05	+/-5.56E-05	0.050	uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pr	Dissolution Soil Prep GL-RAD-A-015	AXM6	04/12/19	1415	1866819

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1870155	76.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	95	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	72.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1864681	104	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: May 3, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: RER Floor

Sample ID: 476212001

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 3, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 476212

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
QC1204254055	474903001	DUP									
Uranium-232	Hh	0.000279	H	0.000412	uCi/g	38.5		(0% - 100%)	JXB7	04/23/19	22:19
Uranium-233/234	Hh	0.000573	H	0.000834	uCi/g	37.1*		(0%-20%)			
Uranium-235/236	HUh	2.40E-05	H	7.87E-05	uCi/g	74.6		(0% - 100%)			
Uranium-238	HUh	6.02E-05	HU	8.86E-05	uCi/g	N/A		N/A			
QC1204254057	LCS										
Uranium-232			U	3.77E-05	uCi/g					04/18/19	23:20
Uranium-233/234				0.00329	uCi/g						
Uranium-235/236				0.000262	uCi/g						
Uranium-238	0.00359			0.00359	uCi/g		100	(75%-125%)			
QC1204254054	MB										
Uranium-232			U	4.35E-05	uCi/g					04/18/19	16:01
Uranium-233/234			U	6.24E-07	uCi/g						
Uranium-235/236			U	4.96E-06	uCi/g						
Uranium-238			U	9.53E-06	uCi/g						
QC1204254056	474903001	MS									
Uranium-232	Hh	0.000279	H	0.000269	uCi/g					04/23/19	22:19

WD:2020:0753 - Attachment B

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

QC Summary

Workorder: 476212

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
Uranium-233/234	Hh	0.000573	H	0.00391	uCi/g				JXB7	04/23/19	22:19
Uranium-235/236	HUh	2.40E-05	H	0.000196	uCi/g						
Uranium-238	0.00359 HUh	6.02E-05	H	0.00311	uCi/g		84.9	(75%-125%)			
Batch	1864681										
QC1204254061	474903001	DUP									
Strontium-90	Hh	0.141	H	0.124	uCi/g	12.7		(0%-20%)	JXB7	04/19/19	07:28
QC1204254063	LCS										
Strontium-90	0.00302			0.00258	uCi/g		85.4	(75%-125%)		04/19/19	07:28
QC1204254060	MB										
Strontium-90			U	3.13E-05	uCi/g					04/19/19	07:28
QC1204254062	474903001	MS									
Strontium-90	0.00317 Hh	0.141	H	0.129	uCi/g		N/A	(75%-125%)		04/19/19	07:28
Batch	1866818										
QC1204259093	476212001	DUP									
Americium-241	H	0.000167	H	0.000153	uCi/g	8.51		(0%-20%)	AXM6	04/19/19	10:49
Cobalt-60	H	5.31E-06	H	5.51E-06	uCi/g	3.74		(0%-20%)			
Cesium-137	H	0.042	H	0.0474	uCi/g	12.1		(0%-20%)			
Cobalt-58	H	0.000106	H	0.000163	uCi/g	42.3		(0% - 100%)			
Niobium-95	H	0.000181	HU	0.000144	uCi/g	9.78		(0% - 100%)			
QC1204259094	LCS										
Americium-241	0.00346			0.00367	uCi/g		106	(75%-125%)		04/19/19	10:50

WD:2020:0753 - Attachment B

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

QC Summary

Workorder: 476212

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1866818										
Cobalt-60	0.00105			0.00118	uCi/g		112	(75%-125%)	AXM6	04/19/19	10:50
Cesium-137	0.00131			0.00148	uCi/g		113	(75%-125%)			
Cobalt-58			U	-1.06E-06	uCi/g						
Niobium-95			U	-1.06E-06	uCi/g						
QC1204259092	MB										
Americium-241			U	3.81E-07	uCi/g					04/19/19	08:14
Cobalt-60			U	4.04E-08	uCi/g						
Cesium-137			U	8.17E-09	uCi/g						
Cobalt-58			U	-3.85E-09	uCi/g						
Niobium-95			U	1.64E-07	uCi/g						
Batch	1870155										
QC1204266874	476212001 DUP										
Plutonium-238		Hh	0.000117	HU	8.83E-05	uCi/g	22.2	(0% - 100%)	JXB7	04/24/19	08:35
Plutonium-239/240		Hh	0.000199	H	0.000136	uCi/g	37.7	(0% - 100%)			
Plutonium-242		HUh	2.73E-05	HU	2.25E-05	uCi/g	N/A		N/A		
QC1204266876	LCS										
Plutonium-238			U	3.53E-05	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352			0.00376	uCi/g		107	(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476212

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1870155										
Plutonium-242			U	6.30E-05	uCi/g				JXB7	04/23/19	20:22
QC1204266873	MB										
Plutonium-238			U	2.82E-05	uCi/g					04/24/19	08:35
Plutonium-239/240			U	3.26E-05	uCi/g						
Plutonium-242			U	3.65E-05	uCi/g						
QC1204266875	476212001	MS									
Plutonium-238		Hh	0.000117	H	0.000136	uCi/g				04/23/19	20:22
Plutonium-239/240	0.00352	Hh	0.000199	H	0.00405	uCi/g	110	(75%-125%)			
Plutonium-242		HUh	2.73E-05	HU	5.31E-05	uCi/g					

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- NI See case narrative
- ND Analyte concentration is not detected above the detection limit

GEL LABORATORIES LLC

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

QC Summary

Workorder: 476212

Page 5 of 5

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.									
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
h	Preparation or preservation holding time was exceeded									

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.

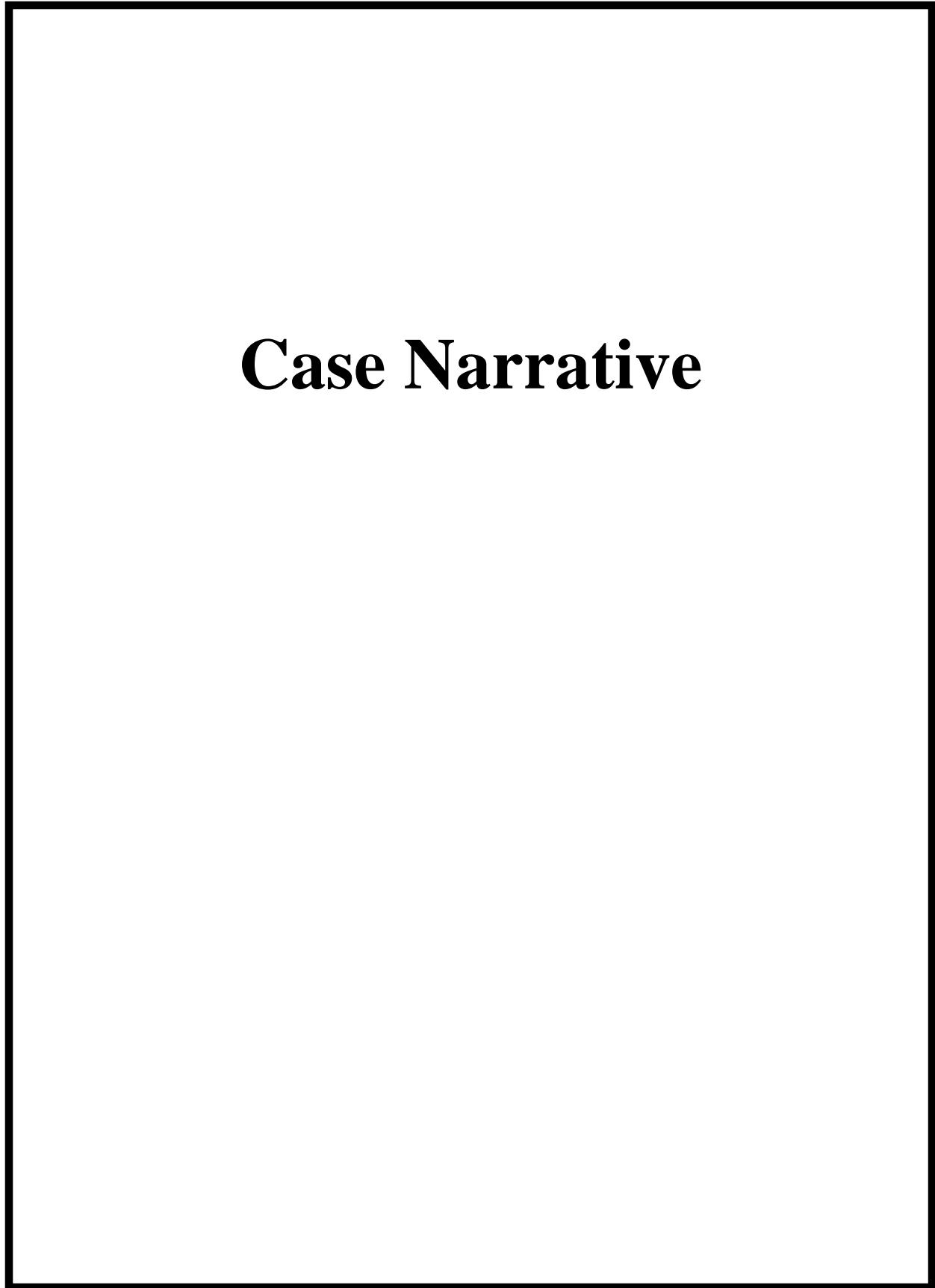
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 03 May 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC
SDG #: 445-003169
Work Order #: 476212

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1864678**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor
1204254054	Method Blank (MB)
1204254055	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254056	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254057	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**Duplication Criteria between QC Sample and Duplicate Sample**

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-233/234	RPD 37.1* (0.00%-20.00%) RER 1.38 (0-3)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254054 (MB)	Uranium-232	Result 0.0000435 < MDA 0.000147 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.000000624 < MDA 0.0000713 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Uranium-235/236	Result 0.00000496 < MDA 0.0000654 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000953 < MDA 0.0000713 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-238	Result 0.0000886 < MDA 0.000109 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Uranium-232	Result -0.000124 < MDA 0.000212 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.0000292 < MDA 0.0000757 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.0000359 < MDA 0.0000837 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204254055 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254056 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Negative > 3 sigma TPU

The result was more negative than the three sigma TPU. The background control chart was examined and the detector was determined to be fully functional.

Sample	Analyte	Value
476212001 (RER Floor)	Uranium-232	Negative Result > 3 sigma value

Recounts

The U-232 and U-236 traced portions of samples 1204254055 (XC-2 Floor DebrisDUP) and 1204254056 (XC-2 Floor DebrisMS) were given additional clean-up steps and recounted in order to remove suspected Plutonium interference. The recounts are being reported.

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

WD:2020:0753 - Attachment B

Analytical Batch: 1870155**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1866819

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

GEL Sample ID#	Client Sample Identification
476212001	RER Floor
1204266873	Method Blank (MB)
1204266874	476212001(RER Floor) Sample Duplicate (DUP)
1204266875	476212001(RER Floor) Matrix Spike (MS)
1204266876	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.

Preparation Information**Aliquot Reduced**

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204266873 (MB)	Plutonium-238	Result 0.0000282 < MDA 0.0000767 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000326 < MDA 0.000105 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000365 < MDA 0.0000977 > RDL 0.000001 uCi/g
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Plutonium-242	Result 0.0000273 < MDA 0.000106 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g

WD:2020:0753 - Attachment B

	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g
476212001 (RER Floor)	Plutonium-242	Result 0.0000273 < MDA 0.000106 > RDL 0.000001 uCi/g

Technical Information**Holding Time**

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204266874 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
1204266875 (RER FloorMS)	Received 11-APR-19, out of holding 24-SEP-18
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Sample Re-prep/Re-analysis

Samples were reprep due to high activity. The reanalysis is being reported.

Recounts

Samples 1204266873 (MB), 1204266874 (RER FloorDUP) and 476212001 (RER Floor) were recounted due to high MDCs. The recounts are reported.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor

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**Holding Time**

Samples were received and analyzed outside the hold time.

Product: Gammaspec, Cs137 Only, solid High Rad

WD:2020:0753 - Attachment B

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1866818

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
476212001	RER Floor
1204259092	Method Blank (MB)
1204259093	476212001(RER Floor) Sample Duplicate (DUP)
1204259094	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

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

<u>Sample</u>	<u>Value</u>
1204259093 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

Recounts

Sample 476212001 (RER Floor) was recounted to verify sample results. Recount is reported.

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

<u>Analyte</u>	<u>Sample</u>	<u>Client Sample</u>
Cobalt-58	476212001	RER Floor
Cobalt-60	476212001	RER Floor
Niobium-95	476212001	RER Floor

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 1864681

Preparation Method: Client Requested Procedure

WD:2020:0753 - Attachment B

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1866819

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

GEL Sample ID#	Client Sample Identification
476212001	RER Floor
1204254060	Method Blank (MB)
1204254061	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254062	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254063	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

Matrix Spike (MS) Recovery

The Matrix Spike (See Below) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

Sample	Analyte	Value
1204254062 (XC-2 Floor DebrisMS)	Strontium-90	-399* (75%-125%), but result > 5x nominal

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204254061 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254062 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
476212001 (RER Floor)	Received 11-APR-19, out of holding 24-SEP-18

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 445-003169 GEL Work Order: 476212

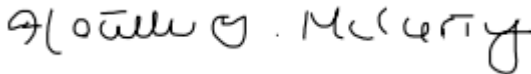
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Heather McCarty**Date:** 03 MAY 2019**Title:** Analyst II

XC-2 – Extraction Cell-2

This page intentionally left blank



April 22, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 474894
SDG: 428-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 29, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

April 22, 2019

Release Number

428

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.01

Description

XC-2 Floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 428-003169
Work Order: 474894

April 22, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

428

Charge Number

WV01.C2.06.01.04.10.01

Summary

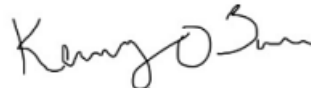
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 29, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
474894001	XC-2 Floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

475-085-474894

WD:2020:0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab:	2. Charge #: WV01.C2.06.01.04.10.01			3. Analysis Requested			4. Electronic Disk? Yes [] No [x]
5. PO #:	6. Release #: 428			U alpha isotopes (U-238, -233/234, 235/236, -238)			7. Report Format Level: I [x] II []
8. Cognizant Engineer/Project: J. Dudek	13. Date			Pu alpha isotopes (Pu-238, -239/240, -242)			9. Priority Code: Routine [x]
10. DQO/SAP#: WVDP-584	Time			Gamma for Cs-137 & Am-241			11. Report Data To: W. Connors
12. Sample ID#	Type	# Cont.	Date	Time	pH		Comments
XC-2 FLOOR SMEARS (5 smears Total)	Grab	1	5-17-17	10:00	na	X	** The five smears are to be composited by the lab to form a composite sample, and analyzed for ²⁴¹ Am, ¹³⁷ Cs, ²³² U, ²³³ U/ ²³⁴ U, ²³⁵ U/ ²³⁶ U, ²³⁸ U, ²³⁹ Pu, ²³⁹ Pu/ ²⁴⁰ Pu, ²⁴² Pu, ⁹⁰ Sr, Report units in uCi per composite sample.

18. Gross Wt (g)	86.84	14. Phase (Circle one):	<input checked="" type="radio"/> Solid	Liquid	Sludge	Other:
Tare Wt (g)	76.85	Type (Circle one):	Debris	Coupon	Pipe Section	Filter
Net Wt (g)	9.99	Sample Bottle Size:	1000 mL	Sample Bottle Type (Circle One):	Glass	16. mCi Alpha NA []

17. Chain-of-Custody Reviewed by:	19. Sample Custodian Signature/Date/Time	20. Sample Receipt:
	<i>J. Dudek</i> 5-17-17 15:05	Temperature 208.5°C
Released by:	Received by:	Cooler Seals Intact? Yes [x] No []
<i>J. Dudek</i>	<i>J. Dudek</i> 5-17-17 13:11	
Released by:	Received by:	
<i>J. Dudek</i>	<i>J. Dudek</i> 5-17-17 13:11	



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>475085 474903 / 474894</u>	
Received By: <u>ZKW/RSO</u>		Date Received: <u>3/29/19</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other	
		<u>8107 1470 9770</u>	
Suspected Hazard Information		Yes	No
		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
A) Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples are to be received as radioactive?		<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed (Observed Counts - Area Background Counts): <u>8.0 CPM / mR/Hr</u> Classified as: Rad 1 <input checked="" type="checkbox"/> Rad 2 <input checked="" type="checkbox"/> Rad 3 <input type="checkbox"/>
D) Did the client designate samples are hazardous?		<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____
Sample Receipt Criteria		Yes	NA
		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	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>20°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>IR3-18</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
		<input checked="" type="checkbox"/>	Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
		<input checked="" type="checkbox"/>	Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected: _____
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"/>	ID's and containers affected: _____
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
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"/>	Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials WU Date 4/2 Page 1 of 1

Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: April 22, 2019

Client Sample ID: XC-2 Floor
 Sample ID: 474894001
 Matrix: Swipe
 Collect Date: 17-MAY-17
 Receive Date: 29-MAR-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.0106	+/-0.000488	2.85E-05	+/-0.00397	2.00E-06	uCi/sample			AXM6	04/17/19	1413	1864683	1
Plutonium-239/240	Hh	0.0122	+/-0.000521	2.91E-05	+/-0.00458	2.00E-06	uCi/sample							
Plutonium-242	Hh	0.000119	+/-5.31E-05	2.80E-05	+/-6.93E-05	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	Hh	1.32E-05	+/-7.15E-06	8.58E-06	+/-7.47E-06	2.00E-06	uCi/sample			AXM6	04/17/19	0815	1864684	2
Uranium-233/234	Hh	9.59E-06	+/-6.32E-06	7.25E-06	+/-6.51E-06	2.00E-06	uCi/sample							
Uranium-235/236	Hh	2.37E-06	+/-3.11E-06	2.37E-06	+/-3.14E-06	2.00E-06	uCi/sample							
Uranium-238	HUh	2.64E-06	+/-4.27E-06	7.04E-06	+/-4.29E-06	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.0563	+/-0.000277	1.13E-05	+/-0.0148	2.00E-06	uCi/sample			AXM6	04/16/19	1458	1864685	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.0206	+/-0.000533	0.000267	+/-0.00284		uCi/sample			AXM6	04/02/19	1309	1863141	4
Cesium-137	Hh	0.031	+/-0.00048	9.31E-05	+/-0.00268	2.00E-07	uCi/sample							
Cobalt-60	Hh	0.000349	+/-7.39E-05	3.90E-05	+/-8.03E-05		uCi/sample							

*Laboratory Composite- Filters RAD III "As Received"***The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	AXM6	04/04/19	1030	1862649

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R
5	GL-RAD-A-026

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1864683	58.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1864684	94.4	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1864684	94.8	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1864685	102	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: April 22, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: XC-2 Floor

Sample ID: 474894001

Project: WVNS02501

Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 22, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 474894

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1863141										
QC1204250642	LCS										
Cobalt-60	0.00538			0.00546	uCi/sample		102	(75%-125%)	AXM6	04/03/19	06:08
Americium-241	0.0303			0.032	uCi/sample		105	(75%-125%)			
Cesium-137	0.00959			0.00961	uCi/sample		100	(75%-125%)			
QC1204250643	LCSD										
Cobalt-60	0.00538			0.00545	uCi/sample	0.312	101	(0%-20%)		04/03/19	07:19
Americium-241	0.0303			0.0294	uCi/sample	8.5	96.8	(0%-20%)			
Cesium-137	0.00959			0.0104	uCi/sample	7.72	108	(0%-20%)			
QC1204250641	MB										
Cobalt-60			U	-1.41E-05	uCi/sample					04/03/19	06:23
Americium-241			U	-0.000141	uCi/sample						
Cesium-137			UI	0.00	uCi/sample						
Batch	1864683										
QC1204254071	LCS										
Plutonium-238				2.28E-05	uCi/sample				AXM6	04/16/19	19:03
Plutonium-239/240	0.0002			0.000211	uCi/sample		105	(75%-125%)			
Plutonium-242			U	1.54E-05	uCi/sample			(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474894

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864683										
QC1204254072	LCSD										
Plutonium-238			U	4.50E-06	uCi/sample	0.718			AXM6	04/16/19	19:03
Plutonium-239/240	0.0002			0.000211	uCi/sample	0.236	105	(0%-20%)			
Plutonium-242			U	1.40E-05	uCi/sample	0					
QC1204254070	MB										
Plutonium-238			U	7.50E-06	uCi/sample					04/16/19	19:03
Plutonium-239/240			U	6.87E-07	uCi/sample						
Plutonium-242			U	4.93E-06	uCi/sample						
Batch	1864684										
QC1204254078	LCS										
Uranium-232			U	-1.88E-06	uCi/sample			(75%-125%)	AXM6	04/17/19	08:15
Uranium-233/234				0.000229	uCi/sample						
Uranium-235/236				2.03E-05	uCi/sample						
Uranium-238	0.000273			0.000244	uCi/sample		89.5	(75%-125%)			
QC1204254079	LCSD										
Uranium-232			U	3.93E-07	uCi/sample	0		(0%-20%)		04/17/19	08:15
Uranium-233/234				0.000231	uCi/sample	0.979					
Uranium-235/236				1.27E-05	uCi/sample	46.1					
Uranium-238	0.000273			0.000238	uCi/sample	2.4	87.3	(0%-20%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474894

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864684										
QC1204254077	MB										
Uranium-232			U	-1.41E-06	uCi/sample				AXM6	04/17/19	08:15
Uranium-233/234			U	-1.63E-06	uCi/sample						
Uranium-235/236			U	8.86E-07	uCi/sample						
Uranium-238			U	1.57E-06	uCi/sample						
<hr/>											
Batch	1864685										
QC1204254081	LCS										
Strontium-90	0.0023			0.00235	uCi/sample		102	(75%-125%)	AXM6	04/16/19	14:58
QC1204254082	LCSD										
Strontium-90	0.0023			0.00232	uCi/sample	1.18	101	(0%-20%)		04/16/19	14:58
QC1204254080	MB										
Strontium-90			U	6.25E-06	uCi/sample					04/16/19	14:57

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474894

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
UI	Gamma Spectroscopy--Uncertain identification										
UJ	Gamma Spectroscopy--Uncertain identification										
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

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.

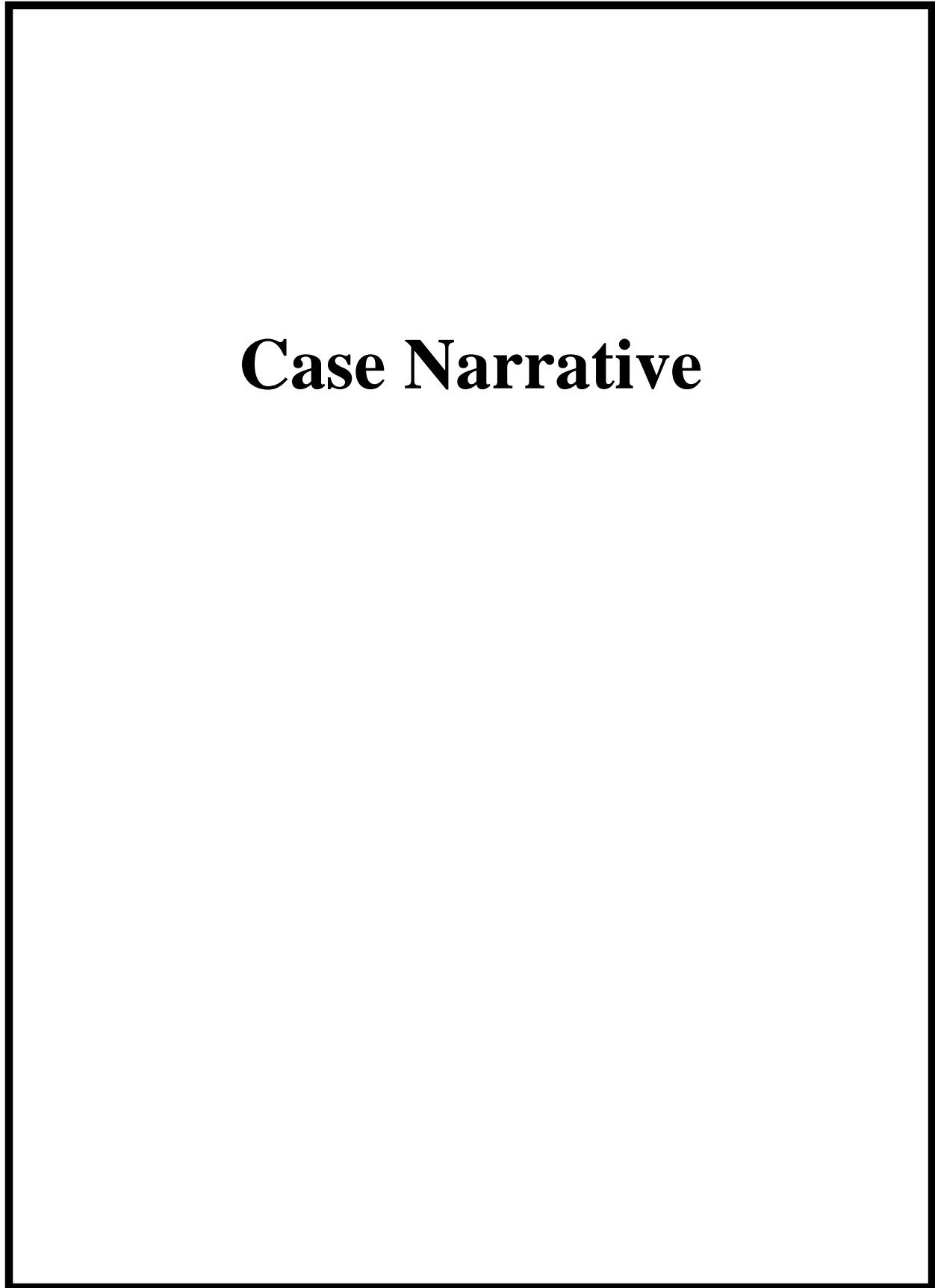
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 22 April 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 428-003169
Work Order #: 474894

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1864683

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1862649

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor
1204254070	Method Blank (MB)
1204254071	Laboratory Control Sample (LCS)
1204254072	Laboratory Control Sample Duplicate (LCSD)

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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254070 (MB)	Plutonium-238	Result 0.0000075 < MDA 0.0000176 > RDL 0.000002 uCi/sample
	Plutonium-239/240	Result 0.000000687 < MDA 0.0000187 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
474894001 (XC-2 Floor)	Received 29-MAR-19, out of holding 13-NOV-17

WD:2020:0753 - Attachment B

Recounts

Sample 474894001 (XC-2 Floor) was recounted for a shorter amount of time in order to reduce tailing. The recount is reported.

Miscellaneous Information

Manual Integration

Manual integration of alpha spectroscopy spectra 474894001 (XC-2 Floor) was performed to fully separate counts in Regions of Interest which would have been biased.

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1864684

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1862649

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor
1204254077	Method Blank (MB)
1204254078	Laboratory Control Sample (LCS)
1204254079	Laboratory Control Sample Duplicate (LCSD)

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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254077 (MB)	Uranium-232	Result -0.00000141 < MDA 0.00000935 > RDL 0.000002 uCi/sample
	Uranium-233/234	Result -0.00000163 < MDA 0.00000599 > RDL 0.000002 uCi/sample
	Uranium-235/236	Result 0.000000886 < MDA 0.00000423 > RDL 0.000002 uCi/sample
	Uranium-238	Result 0.00000157 < MDA 0.00000422 > RDL 0.000002 uCi/sample

WD:2020:0753 - Attachment B

Sample (See Below) did not meet the detection limit due to the small sample aliquot used. The aliquot was reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
474894001 (XC-2 Floor)	Uranium-238	Result 0.00000264 < MDA 0.00000704 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
474894001 (XC-2 Floor)	Received 29-MAR-19, out of holding 13-NOV-17

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1862649

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor

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: Gammascpec, Gamma, Cs137, Filter HIGH RAD

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1863141

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1862649

WD:2020:0753 - Attachment B

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor
1204250641	Method Blank (MB)
1204250642	Laboratory Control Sample (LCS)
1204250643	Laboratory Control Sample Duplicate (LCSD)

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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204250641 (MB)	Cesium-137	Result 0 < MDA 0.0000362 > RDL 0.0000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
474894001 (XC-2 Floor)	Received 29-MAR-19, out of holding 13-NOV-17

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	474894001	XC-2 Floor

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Results are considered a false positive due to no valid peak.	Cesium-137	1204250641	MB for batch 1863141

WD:2020:0753 - Attachment B

Product: GFPC, Sr90, filter HIGH RAD**Analytical Method:** EPA 905.0 Modified/DOE RP501 Rev. 1 Modified**Analytical Procedure:** GL-RAD-A-004 REV# 21**Analytical Batch:** 1864685**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1862649

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor
1204254080	Method Blank (MB)
1204254081	Laboratory Control Sample (LCS)
1204254082	Laboratory Control Sample Duplicate (LCSD)

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**RDL Met**

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254080 (MB)	Strontium-90	Result 0.00000625 < MDA 0.0000123 > RDL 0.000002 uCi/sample

Technical Information**Holding Time**

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
474894001 (XC-2 Floor)	Received 29-MAR-19, out of holding 13-NOV-17

Product: Laboratory Composite- Filters RAD III**Composite Preparation Method:** GL-RAD-A-026

WD:2020:0753 - Attachment B

Composite Preparation Procedure: GL-RAD-A-026 REV# 17

Composite Preparation Batch: 1863195

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474894001	XC-2 Floor

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 428-003169 GEL Work Order: 474894

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature:**Name: Theresa Austin****Date: 22 APR 2019****Title: Group Leader**

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1862649
Analyst: Andrew McKenzie (AXM6)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 22-APR-2019 **Hold:** 13-NOV-2017 **Package:** 24-APR-2019 **SDG:** 26-AP

Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	474894001	04-APR-2019		1	0	3.307	3.307	100	3.307	3.307

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------



April 25, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 474903
SDG: 427-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 29, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

April 25, 2019

Release Number

427

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.01

Description

XC-2 Floor Debris

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 427-003169
Work Order: 474903

April 25, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

427

Charge Number

WV01.C2.06.01.04.10.01

Summary

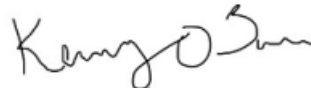
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 29, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
474903001	XC-2 Floor Debris

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

474903

WD:2020:0753 - Attachment B

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

1. Lab:
 2. Charge #: WV01.C2.06.01.04.10.01
 5. PO #:
 6. Release #: 427
 8. Cognizant Engineer/Project: J. Dudek
 10. DQO/SAP#: WVDP-584

Sample ID#	Type	# Cont.	Pres.	13.	
				Date	Time
XC-2 FLOOR DEBRIS	Grab	1	na	5-17-17	10:10

3. Analysis Requested

Analysis Requested	Requested
Am-241 Gamma for Cs-137 &	X
U alpha isotopes (U-232, -233/234, 235/236, -238)	X
Pu alpha isotopes (Pu-238, -239/240, -242)	X
Sr-90	X

4. Electronic Disk? Yes [] No [x]
 7. Report Format Level: I [x] II []
 9. Priority Code: Routine [x]
 11. Report Data To: W. Connors
 Comments
 ** The five smears are to be composited by the lab to form a composite sample and analyzed for ²⁴¹Am, ¹³⁷Cs, ²³²U, ²³³U/²³⁴U, ²³⁵U/²³⁶U, ²³⁸U, ²³⁹Pu, ²⁴⁰Pu, ²⁴²Pu, ⁹⁰Sr. Report units in uCi per composite sample.

14. Phase (Circle one): Solid Liquid Other:
 Type (Circle one): Debris Coupon Pipe Section Filter Particulate Other: Smear
 15. Sample Bottle Size: 500 mL Sample Bottle Type (Circle One): Glass
 16. 210 mCi Alpha NA []
 17. Chain-of-Custody Reviewed by:
 19. Sample Custodian Signature/Date/Time: [Signature] 5/17/17 1230
 Released by: [Signature] 5/17/17 Received by: [Signature] 5/17/17 1505
 Released by: [Signature] 3.27.19 13:11 Received by: [Signature] 3/29/19 9:05
 Released by:
 Received by:
 Released by:
 Received by:
 Cooler Seals Intact? Yes [] No []



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>	SDG/AR/COC/Work Order: <u>475085 47403 / 474894</u>
Received By: <u>ZKN/R50</u>	Date Received: <u>3/29/19</u>
Carrier and Tracking Number	Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other <u>8107 1470 9770</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.
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
B) Did the client designate the samples to be received as radioactive?	<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed (Observed Counts - Area Background Counts): <u>8.0</u> CPM / <u>mR/Hr</u> Classified as: Rad 1 <u>2</u> Rad 3 <u>2</u>
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice <u>None</u> Other: *all temperatures are recorded in Celsius TEMP: <u>20c</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-18</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
				Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
				Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: April 25, 2019

Client Sample ID: XC-2 Floor Debris
 Sample ID: 474903001
 Matrix: Solid
 Collect Date: 17-MAY-17
 Receive Date: 29-MAR-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu242, Solid High Rad "As Received"</i>														
Plutonium-238	Hh	2.73	+/-0.0946	0.00539	+/-0.803	1.00E-06	uCi/g			JXB7	04/23/19	2022	1870155	1
Plutonium-239/240	Hh	2.40	+/-0.0881	0.00423	+/-0.708	1.00E-06	uCi/g							
Plutonium-242	Hh	0.0248	+/-0.00917	0.00449	+/-0.0117	1.00E-06	uCi/g							
<i>Alphaspec U232, Solid High Rad "As Received"</i>														
Uranium-232	Hh	0.000279	+/-0.000137	0.000161	+/-0.000147	1.00E-06	uCi/g			JXB7	04/23/19	2219	1864678	2
Uranium-233/234	Hh	0.000573	+/-0.000168	0.0001	+/-0.000199	1.00E-06	uCi/g							
Uranium-235/236	HUh	2.40E-05	+/-4.10E-05	3.59E-05	+/-4.13E-05	1.00E-06	uCi/g							
Uranium-238	HUh	6.02E-05	+/-6.32E-05	7.87E-05	+/-6.41E-05	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90	Hh	0.141	+/-0.0016	5.20E-05	+/-0.0261	1.00E-04	uCi/g			JXB7	04/19/19	0727	1864681	3
<i>Gammascpec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241	H	1.35	+/-0.00328	0.000993	+/-0.102		uCi/g			AXM6	04/12/19	0854	1863198	4
Cesium-137	H	0.196	+/-0.000913	0.000126	+/-0.016	1.00E-05	uCi/g							
Cobalt-60	H	0.00135	+/-0.000106	4.10E-05	+/-0.00015		uCi/g							
Niobium-94	H	6.31E-05	+/-3.65E-05	3.70E-05	+/-3.69E-05	1.00E-06	uCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Client Requested Pr	Dissolution Soil Prep GL-RAD-A-015	AXM6	04/04/19	1030	1863094

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu242, Solid High Rad "As Received"	1870155	73.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	87.5	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, Solid High Rad "As Received"	1864678	70.5	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid High Rad "As Received"	1864681	99.4	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: April 25, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: XC-2 Floor Debris
 Sample ID: 474903001

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 25, 2019

Page 1 of 5

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 474903

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1863198										
QC1204250756	474903001	DUP									
Americium-241		H	1.35	H	1.31	uCi/g	3.61	(0%-20%)	AXM6	04/12/19	11:05
Cobalt-60		H	0.00135	H	0.00136	uCi/g	0.886	(0%-20%)			
Cesium-137		H	0.196	H	0.187	uCi/g	4.55	(0%-20%)			
Niobium-94		H	6.31E-05	H	0.000108	uCi/g	52.6	(0% - 100%)			
QC1204250757	LCS										
Americium-241	0.0726				0.0735	uCi/g		101	(75%-125%)	04/12/19	10:42
Cobalt-60	0.0193				0.0192	uCi/g		99.7	(75%-125%)		
Cesium-137	0.0251				0.0242	uCi/g		96.5	(75%-125%)		
Niobium-94				U	-2.81E-05	uCi/g					
QC1204250755	MB										
Americium-241				U	-5.42E-06	uCi/g				04/12/19	09:51
Cobalt-60				U	-6.49E-06	uCi/g					
Cesium-137				U	4.95E-06	uCi/g					
Niobium-94				U	1.68E-06	uCi/g					

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474903

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
QC1204254055	474903001	DUP									
Uranium-232	Hh	0.000279	H	0.000412	uCi/g	38.5		(0% - 100%)	JXB7	04/23/19	22:19
Uranium-233/234	Hh	0.000573	H	0.000834	uCi/g	37.1*		(0%-20%)			
Uranium-235/236	HUh	2.40E-05	H	7.87E-05	uCi/g	74.6		(0% - 100%)			
Uranium-238	HUh	6.02E-05	HU	8.86E-05	uCi/g	N/A		N/A			
QC1204254057	LCS										
Uranium-232			U	3.77E-05	uCi/g					04/18/19	23:20
Uranium-233/234				0.00329	uCi/g						
Uranium-235/236				0.000262	uCi/g						
Uranium-238		0.00359		0.00359	uCi/g		100	(75%-125%)			
QC1204254054	MB										
Uranium-232			U	4.35E-05	uCi/g					04/18/19	16:01
Uranium-233/234			U	6.24E-07	uCi/g						
Uranium-235/236			U	4.96E-06	uCi/g						
Uranium-238			U	9.53E-06	uCi/g						
QC1204254056	474903001	MS									
Uranium-232	Hh	0.000279	H	0.000269	uCi/g					04/23/19	22:19
Uranium-233/234	Hh	0.000573	H	0.00391	uCi/g						

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474903

Page 3 of 5

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1864678										
Uranium-235/236	HUh	2.40E-05	H	0.000196	uCi/g				JXB7	04/23/19	22:19
Uranium-238	0.00359 HUh	6.02E-05	H	0.00311	uCi/g		84.9	(75%-125%)			
Batch	1864681										
QC1204254061	474903001	DUP									
Strontium-90	Hh	0.141	H	0.124	uCi/g	12.7		(0%-20%)	JXB7	04/19/19	07:28
QC1204254063	LCS										
Strontium-90	0.00302			0.00258	uCi/g		85.4	(75%-125%)		04/19/19	07:28
QC1204254060	MB										
Strontium-90			U	3.13E-05	uCi/g					04/19/19	07:28
QC1204254062	474903001	MS									
Strontium-90	0.00317 Hh	0.141	H	0.129	uCi/g		N/A	(75%-125%)		04/19/19	07:28
Batch	1870155										
QC1204266874	476212001	DUP									
Plutonium-238	Hh	0.000117	HU	8.83E-05	uCi/g	22.2		(0% - 100%)	JXB7	04/24/19	08:35
Plutonium-239/240	Hh	0.000199	H	0.000136	uCi/g	37.7		(0% - 100%)			
Plutonium-242	HUh	2.73E-05	HU	2.25E-05	uCi/g	N/A		N/A			
QC1204266876	LCS										
Plutonium-238			U	3.53E-05	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352			0.00376	uCi/g		107	(75%-125%)			
Plutonium-242			U	6.30E-05	uCi/g						

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474903

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1870155										
QC1204266873	MB										
Plutonium-238			U	2.82E-05	uCi/g				JXB7	04/24/19	08:35
Plutonium-239/240			U	3.26E-05	uCi/g						
Plutonium-242			U	3.65E-05	uCi/g						
QC1204266875	476212001	MS									
Plutonium-238	Hh	0.000117	H	0.000136	uCi/g					04/23/19	20:22
Plutonium-239/240	0.00352	Hh	0.000199	H	0.00405	uCi/g	110	(75%-125%)			
Plutonium-242	HUh	2.73E-05	HU	5.31E-05	uCi/g						

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected

GEL LABORATORIES LLC

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

QC Summary

Workorder: 474903

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
U											
UI											
UJ											
UL											
X											
Y											
^											
h											

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

UI Gamma Spectroscopy--Uncertain identification

UJ Gamma Spectroscopy--Uncertain identification

UL Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.

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

Y Other specific qualifiers were required to properly define the results. Consult case narrative.

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

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.

List of current GEL Certifications as of 25 April 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-3
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-15
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis

Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 427-003169
Work Order #: 474903

Product: Alphaspec U232, Solid High Rad**Analytical Method:** DOE EML HASL-300, U-02-RC Modified**Analytical Procedure:** GL-RAD-A-011 REV# 27**Analytical Batch:** 1864678**Preparation Method:** Client Requested Procedure**Preparation Procedure:** GL-RAD-A-015 REV# 18**Preparation Batch:** 1863094

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474903001	XC-2 Floor Debris
1204254054	Method Blank (MB)
1204254055	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254056	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254057	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**Duplication Criteria between QC Sample and Duplicate Sample**

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-233/234	RPD 37.1* (0.00%-20.00%) RER 1.38 (0-3)

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204254054 (MB)	Uranium-232	Result 0.0000435 < MDA 0.000147 > RDL 0.000001 uCi/g
	Uranium-233/234	Result 0.000000624 < MDA 0.0000713 > RDL 0.000001 uCi/g

WD:2020-0753 - Attachment B

	Uranium-235/236	Result 0.00000496 < MDA 0.0000654 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.00000953 < MDA 0.0000713 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204254055 (XC-2 Floor DebrisDUP)	Uranium-238	Result 0.0000886 < MDA 0.000109 > RDL 0.000001 uCi/g
474903001 (XC-2 Floor Debris)	Uranium-235/236	Result 0.000024 < MDA 0.0000359 > RDL 0.000001 uCi/g
	Uranium-238	Result 0.0000602 < MDA 0.0000787 > RDL 0.000001 uCi/g

Technical Information

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204254055 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254056 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
474903001 (XC-2 Floor Debris)	Received 29-MAR-19, out of holding 13-NOV-17

Recounts

The U-232 and U-236 traced portions of samples 1204254055 (XC-2 Floor DebrisDUP), 1204254056 (XC-2 Floor DebrisMS) and 474903001 (XC-2 Floor Debris) were given additional clean-up steps and recounted in order to remove suspected Plutonium interference. The recounts are being reported.

Product: Alphaspec Pu242, Solid High Rad

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1870155

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1863094

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474903001	XC-2 Floor Debris
1204266873	Method Blank (MB)

WD:2020:0753 - Attachment B

1204266874 476212001(RER Floor) Sample Duplicate (DUP)

1204266875 476212001(RER Floor) Matrix Spike (MS)

1204266876 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.

Preparation Information

Aliquot Reduced

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204266873 (MB)	Plutonium-238	Result 0.0000282 < MDA 0.0000767 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000326 < MDA 0.000105 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000365 < MDA 0.0000977 > RDL 0.000001 uCi/g
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g

Samples (See Below) did not meet the detection limits due to the small sample aliquots used. The aliquots were reduced due to the high activity of other isotopes and in attempt to minimize interference.

Sample	Analyte	Value
1204266873 (MB)	Plutonium-238	Result 0.0000282 < MDA 0.0000767 > RDL 0.000001 uCi/g
	Plutonium-239/240	Result 0.0000326 < MDA 0.000105 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000365 < MDA 0.0000977 > RDL 0.000001 uCi/g
1204266874 (RER FloorDUP)	Plutonium-238	Result 0.0000883 < MDA 0.0000934 > RDL 0.000001 uCi/g
	Plutonium-242	Result 0.0000225 < MDA 0.000113 > RDL 0.000001 uCi/g

Technical Information

WD:2020:0753 - Attachment B

Holding Time

Samples (See Below) were logged in and analyzed outside the hold time.

Sample	Value
1204266874 (RER FloorDUP)	Received 11-APR-19, out of holding 24-SEP-18
1204266875 (RER FloorMS)	Received 11-APR-19, out of holding 24-SEP-18
474903001 (XC-2 Floor Debris)	Received 29-MAR-19, out of holding 13-NOV-17

Sample Re-prep/Re-analysis

Samples were reprep due to high activity. The reanalysis is being reported.

Recounts

Samples 1204266873 (MB) and 1204266874 (RER FloorDUP) were recounted due to high MDCs. The recounts are reported.

Miscellaneous Information

Manual Integration

Manual integration of alpha spectroscopy spectra 474903001 (XC-2 Floor Debris) was performed to fully separate counts in Regions of Interest which would have been biased.

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1863094

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474903001	XC-2 Floor Debris

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: Gammaspec, Cs137 Only, solid High Rad

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1863198

WD:2020:0753 - Attachment B

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474903001	XC-2 Floor Debris
1204250755	Method Blank (MB)
1204250756	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204250757	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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204250755 (MB)	Cesium-137	Result 0.00000495 < MDA 0.0000246 > RDL 0.00001 uCi/g

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204250756 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
474903001 (XC-2 Floor Debris)	Received 29-MAR-19, out of holding 13-NOV-17

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	474903001	XC-2 Floor Debris
Niobium-94	474903001	XC-2 Floor Debris

Product: GFPC, Sr90, solid High Rad

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 21

WD:2020:0753 - Attachment B

Analytical Batch: 1864681

Preparation Method: Client Requested Procedure

Preparation Procedure: GL-RAD-A-015 REV# 18

Preparation Batch: 1863094

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
474903001	XC-2 Floor Debris
1204254060	Method Blank (MB)
1204254061	474903001(XC-2 Floor Debris) Sample Duplicate (DUP)
1204254062	474903001(XC-2 Floor Debris) Matrix Spike (MS)
1204254063	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

Matrix Spike (MS) Recovery

The Matrix Spike (See Below) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

Sample	Analyte	Value
1204254062 (XC-2 Floor DebrisMS)	Strontium-90	-399* (75%-125%), but result > 5x nominal

Technical Information

Holding Time

Samples (See Below) were received and analyzed outside the hold time.

Sample	Value
1204254061 (XC-2 Floor DebrisDUP)	Received 29-MAR-19, out of holding 13-NOV-17
1204254062 (XC-2 Floor DebrisMS)	Received 29-MAR-19, out of holding 13-NOV-17
474903001 (XC-2 Floor Debris)	Received 29-MAR-19, out of holding 13-NOV-17

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**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 427-003169 GEL Work Order: 474903

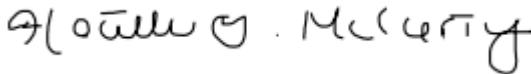
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Heather McCarty**Date:** 24 APR 2019**Title:** Analyst II

XC-3 – Extraction Cell-3

This page intentionally left blank



March 20, 2019

Mr. William Connors
CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York 14171-9799

Re: CH-003169 Haz Waste
Work Order: 472051
SDG: 426-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 22, 2019. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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. 4705.

Sincerely,

Kerry OBarr for
Katherine Cates
Project Manager

Purchase Order: CH-003169
Enclosures



Sample Summary

Sample Summary Sheet

March 20, 2019

Release Number

426

Purchase Order Number

CH-003169

Charge #

WV01.C2.06.01.04.10.02

Description

XC3 floor

General Narrative

Case Narrative
for
CH2M HILL BWXT West Valley, LLC
SDG: 426-003169
Work Order: 472051

March 20, 2019

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Purchase Order

CH-003169

Release Number

426

Charge Number

WV01.C2.06.01.04.10.02

Summary

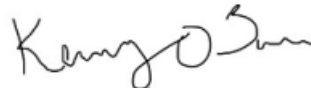
Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on February 22, 2019 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
472051001	XC3 floor

Case Narrative

The laboratory case narrative included in the Radiochemistry data section of the deliverable outlines any NCRs or problems associated with the data for this Release. Sample analyses were conducted using methodology as outlined in GEL Standard Operating Procedures. Procedure references are also included in the laboratory case narrative. This data package, to the best of my knowledge is in compliance with technical and administrative requirements.



Kerry OBarr for
Katherine Cates
Project Manager

Data Review Qualifier Definitions

WD:2020:0753 - Attachment B

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

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

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

WD:2020:0753 - Attachment B

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.

For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Chain of Custody and Supporting Documentation

Appendix B
CHAIN-OF-CUSTODY / REQUEST-FOR-ANALYSIS
(Page 1 of 2)

WD:2020-0753 - Attachment B

CH2M HILL BWXT, West Valley LLC
10282 Rock Springs Road
West Valley, NY 14171-9799

472051

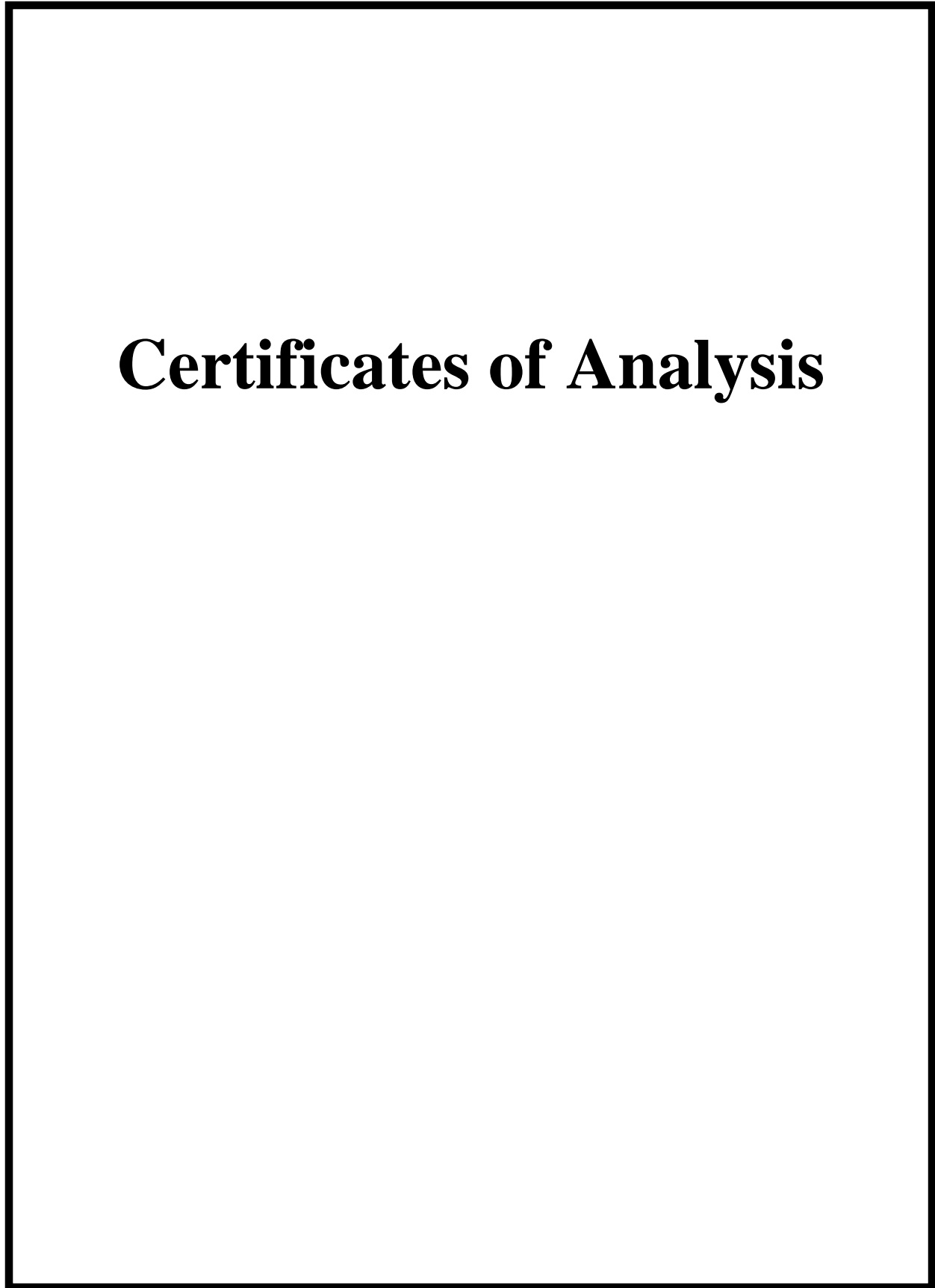
1. Lab: GEL	2. Charge #: WV01.C2.06.01.04.10.04.02	3. Analysis Requested	4. Electronic Disk? Yes [] No [X]
5. PO #: CH-003169	6. Release #: 426	Gamma ftr G-137 U alpha isotopes (U-232, -233/234) Pu alpha isotopes (Pu-238, -239/240, -241)	7. Report Format Level: I [X] II []
8. Cognizant Engineer/Project: FDP		X	9. Priority Code: Routine [X]
10. DQO/SAP#: n/a		X	11. Report Data To: W. Connors
12. Sample ID#	Type	# Cont.	Pres.
XC3 floor	Grab	1	none
	Date	Time	pH
	3/17/17	0930	n/a
*Am-241, C-14, Cm-243, Cm-244, Cs-137, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sr-90, Te-99, U-232, U-233, U-234, U-235, U-236, U-238, Pu-242			
18. Gross Wt (g)	54.18	Phase (Circle one): Solid	Liquid Sludge Other:
Tare Wt (g)	37.6	Type (Circle one): Smear	Particulate
Net Wt (g)	16.58	Sample Bottle Size: 60 ml 550 ml	Sample Bottle Type (Circle One): Glass Poly
17. Chain-of-Custody Reviewed by: <i>James Brodigan</i>			
19. Sample Custodian Signature/Date/Time			
Released by: <i>J. B. Brodigan</i> 3-20-17 14:30			
Received by: <i>Paula Needham</i> 3/20/17 14:30			
Received by: <i>[Signature]</i> 12/27/19 9:10			
Received by: <i>[Signature]</i>			
Received by: <i>[Signature]</i>			
20. Sample Receipt:			
Temperature _____ °C			
Cooler Seals Intact? Yes [] No [X]			



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WVNS</u>		SDG/AR/COC/Work Order: <u>47205 472050</u>	
Received By: <u>RSO</u>		Date Received: <u>2/22/19</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>8107 1470 9830</u>	
Suspected Hazard Information		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
A) Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hazard Class Shipped: _____ UN#: <u>2910</u> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
B) Did the client designate the samples are to be received as radioactive?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	COC notation or radioactive stickers on containers equal client designation.	
C) Did the RSO classify the samples as radioactive?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>1.5 CPM / hr/hr</u> Classified as: Rad 1 Rad 2 <input checked="" type="checkbox"/> Rad 3	
D) Did the client designate samples are hazardous?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	COC notation or hazard labels on containers equal client designation	
E) Did the RSO identify possible hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If D or E is yes, select Hazards below. <input checked="" type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other:	
Sample Receipt Criteria		Comments/Qualifiers. (Required for Non-Conforming Items)	
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/> No	Preservation Method: Wet Ice Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: *all temperatures are recorded in Celsius TEMP: <u>17°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Temperature Device Serial #: <u>174-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	If Yes, are Encores or Soil Kits present for solids? Yes _____ No _____ NA _____ (If yes, take to VOA Freezer)
			Do liquid VOA vials contain acid preservation? Yes _____ No _____ NA _____ (If unknown, select No)
			Are liquid VOA vials free of headspace? Yes _____ No _____ NA _____ Sample ID's and containers affected: _____
8	Samples received within holding time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/> No	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA <input type="checkbox"/> No	Circle Applicable: Not relinquished Other (describe)
Comments (Use Continuation Form if needed): <u>* Both over 25 uCi/g</u>			

PM (or PMA) review: Initials AM Date 2/22/19 Page 1 of 1



Certificates of Analysis

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road
 West Valley, New York 14171-9799
 Contact: Mr. William Connors
 Project: CH-003169 Haz Waste

Report Date: March 20, 2019

Client Sample ID: XC3 floor
 Sample ID: 472051001
 Matrix: Filter
 Collect Date: 17-MAR-17
 Receive Date: 22-FEB-19
 Collector: Client

Project: WVNS02501
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
High Rad Testing														
<i>Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"</i>														
Plutonium-238	Hh	0.000188	+/-2.43E-05	8.75E-06	+/-3.66E-05	2.00E-06	uCi/sample			AXM6	03/09/19	1045	1852253	1
Plutonium-239/240	Hh	0.000254	+/-2.82E-05	1.19E-05	+/-4.64E-05	2.00E-06	uCi/sample							
Plutonium-242	HUh	2.65E-06	+/-4.57E-06	7.77E-06	+/-4.59E-06	0.0002	uCi/sample							
<i>Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"</i>														
Uranium-232	Hh	2.58E-06	+/-2.09E-06	1.58E-06	+/-2.14E-06	2.00E-06	uCi/sample			AXM6	03/09/19	1013	1852254	2
Uranium-233/234	HUh	9.75E-07	+/-1.00E-06	1.47E-06	+/-1.02E-06	2.00E-06	uCi/sample							
Uranium-235/236	HUh	4.99E-07	+/-6.32E-07	7.85E-07	+/-6.39E-07	2.00E-06	uCi/sample							
Uranium-238	HUh	4.41E-07	+/-7.71E-07	1.30E-06	+/-7.76E-07	2.00E-06	uCi/sample							
<i>GFPC, Sr90, filter HIGH RAD "As Received"</i>														
Strontium-90	Hh	0.00236	+/-3.31E-05	3.85E-06	+/-0.000613	2.00E-06	uCi/sample			AXM6	03/08/19	1500	1852255	3
<i>Gammascpec, Gamma, Cs137, Filter HIGH RAD "As Received"</i>														
Americium-241	Hh	0.000647	+/-0.00011	8.22E-05	+/-0.000141		uCi/sample			JXB7	02/26/19	1019	1852244	4
Cesium-137	Hh	0.000222	+/-6.50E-05	4.48E-05	+/-6.77E-05	2.00E-07	uCi/sample							
Cobalt-60	Hh	7.02E-05	+/-5.32E-05	4.78E-05	+/-5.35E-05		uCi/sample							

*Laboratory Composite- Filters RAD III "As Received"***The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Filter Prep	Filter Prep	JXB7	02/28/19	1007	1852242

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, U-02-RC Modified
3	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
4	DOE HASL 300, 4.5.2.3/Ga-01-R
5	GL-RAD-A-026

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-236 Tracer	Alphaspec Pu 238, 239, 240, 242 HIGH RAD "As Received"	1852253	89.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1852254	84.9	(15%-125%)
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 HIGH RAD "As Received"	1852254	80.3	(15%-125%)
Strontium Carrier	GFPC, Sr90, filter HIGH RAD "As Received"	1852255	92.7	(25%-125%)

Certificate of Analysis

Company : CH2M HILL BWXT West Valley
 Address : LLC.
 10282 Rock Springs Road

West Valley, New York 14171-9799

Report Date: March 20, 2019

Contact: Mr. William Connors

Project: CH-003169 Haz Waste

Client Sample ID: XC3 floor
 Sample ID: 472051001

Project: WVNS02501
 Client ID: WVNS025

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

QC Summary

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 20, 2019

Page 1 of 4

CH2M HILL BWXT West Valley LLC.
10282 Rock Springs Road
West Valley, New York

Contact: Mr. William Connors

Workorder: 472051

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852244										
QC1204226460	LCS										
Cobalt-60	0.00545			0.00567	uCi/sample		104	(75%-125%)	JXB7	02/26/19	15:56
Americium-241	0.0304			0.0314	uCi/sample		104	(75%-125%)			
Cesium-137	0.00961			0.0101	uCi/sample		105	(75%-125%)			
QC1204226461	LCSD										
Cobalt-60	0.00545			0.00534	uCi/sample	5.98	97.9	(0%-20%)		02/26/19	17:58
Americium-241	0.0304			0.0313	uCi/sample	0.447	103	(0%-20%)			
Cesium-137	0.00961			0.00923	uCi/sample	8.79	96	(0%-20%)			
QC1204226459	MB										
Cobalt-60			U	2.31E-06	uCi/sample					02/26/19	15:56
Americium-241			U	1.50E-05	uCi/sample						
Cesium-137			U	5.75E-08	uCi/sample						
Batch	1852253										
QC1204226478	LCS										
Plutonium-238			U	4.68E-06	uCi/sample				AXM6	03/09/19	10:45
Plutonium-239/240	0.0002			0.000222	uCi/sample		111	(75%-125%)			
Plutonium-242			U	2.35E-06	uCi/sample			(75%-125%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472051

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852253										
QC1204226479	LCSD										
Plutonium-238			U	3.41E-06	uCi/sample	0			AXM6	03/09/19	10:45
Plutonium-239/240	0.0002			0.000222	uCi/sample	0.304	111	(0%-20%)			
Plutonium-242				8.26E-06	uCi/sample	47.2					
QC1204226477	MB										
Plutonium-238			U	2.57E-06	uCi/sample					03/09/19	10:45
Plutonium-239/240			U	3.04E-06	uCi/sample						
Plutonium-242			U	2.36E-07	uCi/sample						
Batch	1852254										
QC1204226484	LCS										
Uranium-232			U	-9.32E-08	uCi/sample			(75%-125%)	AXM6	03/09/19	10:13
Uranium-233/234				4.71E-05	uCi/sample						
Uranium-235/236				3.59E-06	uCi/sample						
Uranium-238	5.45E-05			5.28E-05	uCi/sample		96.9	(75%-125%)			
QC1204226485	LCSD										
Uranium-232			U	1.38E-07	uCi/sample	0		(0%-20%)		03/09/19	10:13
Uranium-233/234				5.84E-05	uCi/sample	21.4					
Uranium-235/236				3.52E-06	uCi/sample	1.89					
Uranium-238	5.45E-05			5.71E-05	uCi/sample	7.8	105	(0%-20%)			

WD:2020:0753 - Attachment B

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472051

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
High Rad Testing											
Batch	1852254										
QC1204226483	MB										
Uranium-232			U	-2.76E-07	uCi/sample				AXM6	03/09/19	10:13
Uranium-233/234			U	-3.22E-07	uCi/sample						
Uranium-235/236			U	9.47E-08	uCi/sample						
Uranium-238			U	1.35E-07	uCi/sample						
Batch	1852255										
QC1204226487	LCS										
Strontium-90		0.000154		0.000141	uCi/sample		91.8	(75%-125%)	AXM6	03/08/19	15:00
QC1204226488	LCSD										
Strontium-90		0.000154		0.000155	uCi/sample	8.86	100	(0%-20%)		03/08/19	15:00
QC1204226486	MB										
Strontium-90			U	7.08E-08	uCi/sample					03/08/19	15:00

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 472051

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
UI	Gamma Spectroscopy--Uncertain identification										
UJ	Gamma Spectroscopy--Uncertain identification										
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

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.

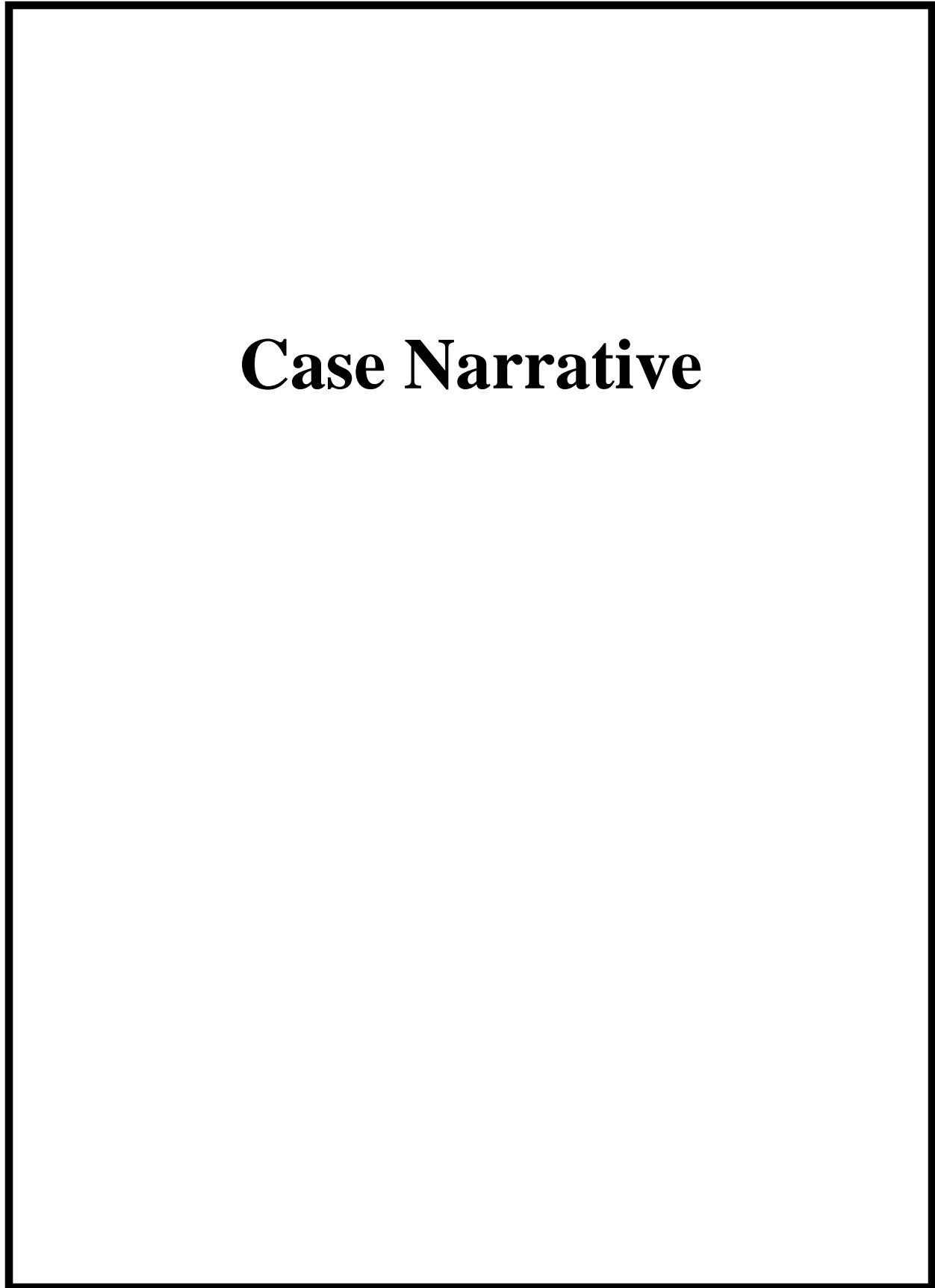
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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.

List of current GEL Certifications as of 20 March 2019

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA024
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122019-2
New Hampshire NELAP	2054
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-19-14
Utah NELAP	SC000122018-27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis



Case Narrative

WD:2020:0753 - Attachment B

Radiochemistry
Technical Case Narrative
CH2M HILL BWXT West Valley, LLC (WVNS)
SDG #: 426-003169
Work Order #: 472051

Product: Alphaspec Pu 238, 239, 240, 242 HIGH RAD
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Procedure: GL-RAD-A-011 REV# 27
Analytical Batch: 1852253

Preparation Method: Filter Prep
Preparation Procedure: GL-RAD-A-026 REV# 17
Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor
1204226477	Method Blank (MB)
1204226478	Laboratory Control Sample (LCS)
1204226479	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information

Aliquot Reduced

Aliquots were reduced due to high activity based on Gamma data.

Quality Control (QC) Information

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204226477 (MB)	Plutonium-238	Result 0.00000257 < MDA 0.00000557 > RDL 0.000002 uCi/sample
	Plutonium-239/240	Result 0.00000304 < MDA 0.00000733 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

WD:2020:0753 - Attachment B

Sample	Value
472051001 (XC3 floor)	Received 22-FEB-19, out of holding 13-SEP-17

Product: Alphaspec U232, 233, 234, 235, 238 HIGH RAD

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 27

Analytical Batch: 1852254

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor
1204226483	Method Blank (MB)
1204226484	Laboratory Control Sample (LCS)
1204226485	Laboratory Control Sample Duplicate (LCSD)

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

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472051001 (XC3 floor)	Received 22-FEB-19, out of holding 13-SEP-17

Recounts

The U-232 traced portion of sample 472051001 (XC3 floor) was given additional clean-up steps and recounted in order to improve the resolution. The sample was recount(ed again to verify the result and the third count is reported.

Preparation Method: Filter Prep

WD:2020:0753 - Attachment B

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor

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: Gammascpec, Gamma, Cs137, Filter HIGH RAD

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1852244

Preparation Method: Filter Prep

Preparation Procedure: GL-RAD-A-026 REV# 17

Preparation Batch: 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor
1204226459	Method Blank (MB)
1204226460	Laboratory Control Sample (LCS)
1204226461	Laboratory Control Sample Duplicate (LCSD)

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

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204226459 (MB)	Cesium-137	Result 0.0000000575 < MDA 0.0000234 > RDL 0.0000002 uCi/sample

WD:2020:0753 - Attachment B

Technical Information**Holding Time**

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472051001 (XC3 floor)	Received 22-FEB-19, out of holding 13-SEP-17

Additional Identified Radionuclides

The following radionuclides were not requested but have been identified and reported.

Analyte	Sample	Client Sample
Cobalt-60	472051001	XC3 floor

Product: GFPC, Sr90, filter HIGH RAD**Analytical Method:** EPA 905.0 Modified/DOE RP501 Rev. 1 Modified**Analytical Procedure:** GL-RAD-A-004 REV# 21**Analytical Batch:** 1852255**Preparation Method:** Filter Prep**Preparation Procedure:** GL-RAD-A-026 REV# 17**Preparation Batch:** 1852242

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor
1204226486	Method Blank (MB)
1204226487	Laboratory Control Sample (LCS)
1204226488	Laboratory Control Sample Duplicate (LCSD)

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.

Preparation Information**Preparation Information**

Performed additional column separation to minimize interference.

Quality Control (QC) Information

WD:2020:0753 - Attachment B

RDL Met

The blank (See Below) did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Sample	Analyte	Value
1204226486 (MB)	Strontium-90	Result 0.0000000708 < MDA 0.00000345 > RDL 0.000002 uCi/sample

Technical Information

Holding Time

Sample (See Below) was received and analyzed outside the hold time.

Sample	Value
472051001 (XC3 floor)	Received 22-FEB-19, out of holding 13-SEP-17

Product: Laboratory Composite- Filters RAD III

Composite Preparation Method: GL-RAD-A-026

Composite Preparation Procedure: GL-RAD-A-026 REV# 17

Composite Preparation Batch: 1852092

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
472051001	XC3 floor

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

WVNS025 CH2M HILL BWXT West Valley, LLC

Client SDG: 426-003169 GEL Work Order: 472051

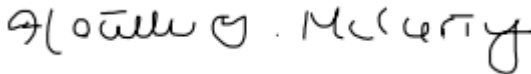
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded

Review/Validation

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

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

Signature: **Name:** Heather McCarty**Date:** 20 MAR 2019**Title:** Analyst II

Prep Logbook

WD:2020:0753 - Attachment B

The Preparation of Special Matrices for the Determination of Radionuclides

Batch ID: 1852242
Analyst: Jon Burgess (JXB7)
Method: Filter Prep
Lab SOP: GL-RAD-A-026 REV# 17
Instrument: R2-38110047

Due Dates for Lab: 18-MAR-2019 **Hold:** 13-SEP-2017 **Package:** 20-MAR-2019 **SDG:** 22-M
Type Sample Id Description Serial Number Spike Amount Spike Units

#	Sample ID	Prep Date	Min RDL ()	Number of Filters	Container Wt (g)	Weight of total filter with container (g)	Weight of filter Diluted with container (g)	Not Saved Final Volume of filter diluted to in Liters (mL)	Total Filter Weight (g)	Weight of Filter Diluted (g)
1	472050001	28-FEB-2019		1	0	12.6414	12.6414	100	12.6414	12.6414
2	472051001	28-FEB-2019		1	0	3.1628	3.1628	100	3.1628	3.1628

Reagent/Solvent Lot ID	Description	Amount	Comments:
------------------------	-------------	--------	-----------

This page intentionally left blank