

# 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:2023:0204  
March 1, 2023

ATTENTION:

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 an addendum to the final set of data packages (i.e., Radiological Controls survey reports and analytical data packages) for the Main Plant Process Building (MPPB). This information was gathered at the request of DOE and in accordance with WVDP-584, Revision 1. This information is in addition to data packages previously transmitted to DOE.

The attached documents were reviewed with Jamie Prowse on February 28, 2023, prior to being transmitted formally. We believe this completes CHBWV's obligation to collect and submit Sampling and Analysis Plan (SAP) data packages for the MPPB.

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

Sincerely,



John D. Rendall  
President and General Manager

JDR:CD:bjn

Attachment: Addendum to SAP Submittal 3

cc: A. M. Cooney, DOE-EMCBC  
S. W. Chase, CHBWV  
S. A. Cherry, CHBWV  
C. M. Chun, CHBWV

T. D. Dogal, CHBWV  
L. K. Hollfelder, CHBWV  
D. M. Martinet, CHBWV  
K. A. Wooley, CHBWV

## MPPB Samples – (Addendum to Submittal 3)

## Areas included in this Data Package

Area Sampled	Information Provided
Chemical Process Cell (CPC) Door Slot	Survey of 3m3 door slot
General Operating Aisle (GOA)	Final survey prior to grouting
Mechanical Operating Aisle (MOA)	Survey
Off-Gas Blower Room (OGBR)	Sample results
Off-Gas Cell (OGC)	Survey
Waste Receiving and Packaging Area (WRPA)	Survey

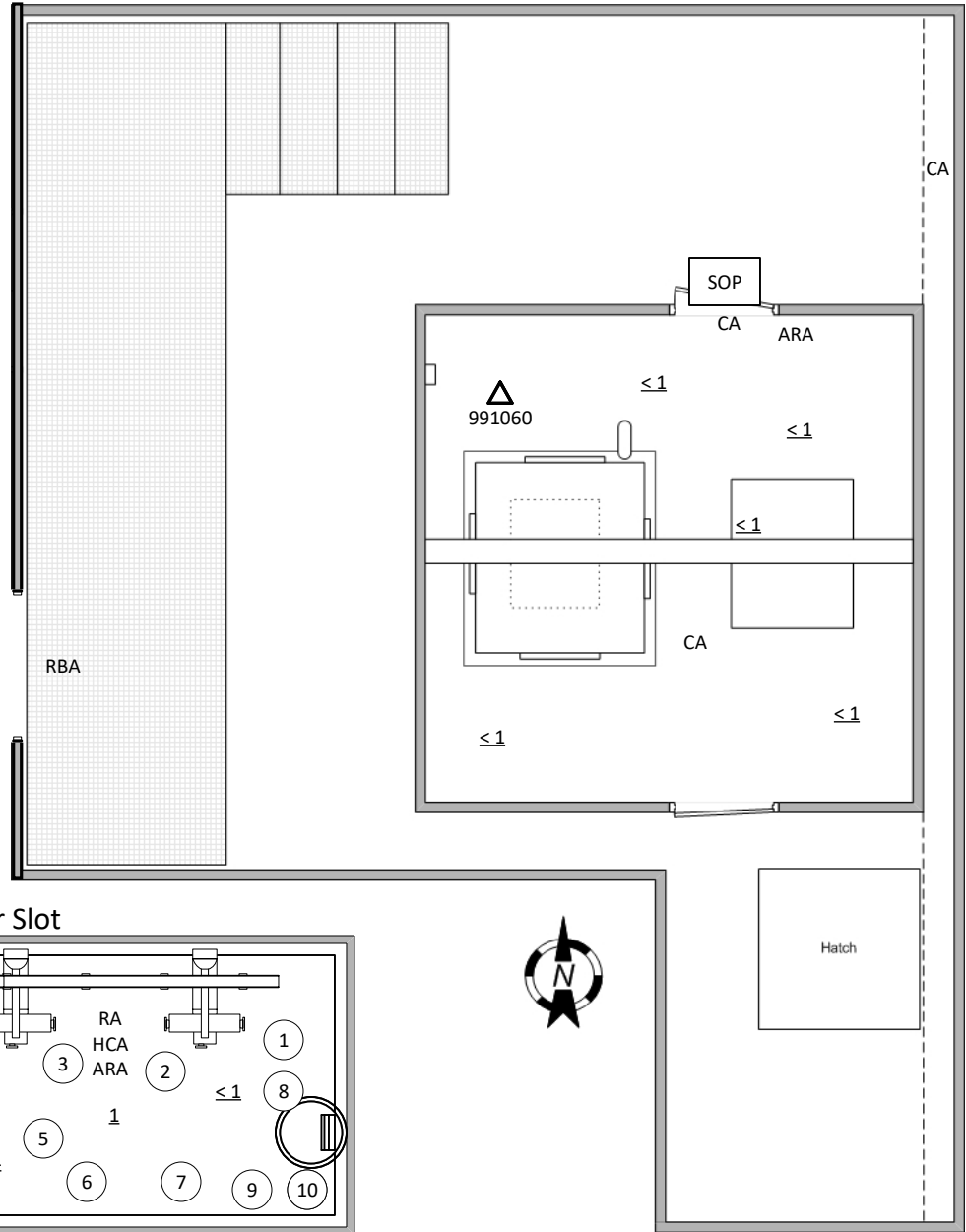
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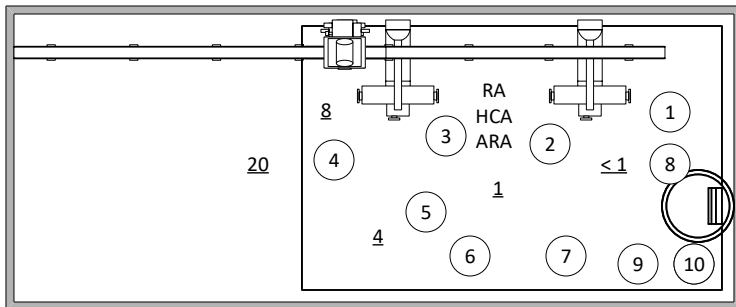
Comments:

Smears Taken to Verify Conditions.

- RBA - Radiological Buffer Area
- CA - Contamination Area
- HCA - High Contamination Area
- RA - Radiation Area
- HRA - High Radiation Area
- A/L - Airlock
- ARA - Airborne Radioactivity Area
- △ - Air Sample Location
- RM - Radioactive Material
- RAA - Restricted Access Area
- SOP - Step Off Pad
- - Radiological Boundary
- # - General Area Dose Rates  
(In mR/hr)
  
- FME - Foreign Material Exclusion



3M3 Door Slot



Results in DPM

Smearable Net (DPM/100 cm<sup>2</sup>)

\*Smears Field Checked and Converted\*

Count Time 1.25 Min.

#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
1	<50	<1K	7	100	60K	--	--	--	--	--	--	--	--	--
2	<50	<1K	8	<50	4K	--	--	--	--	--	--	--	--	--
3	<50	4K	9	120	80K	--	--	--	--	--	--	--	--	--
4	<50	5K	10	<50	3K	--	--	--	--	--	--	--	--	--
5	<50	6K	--	--	--	--	--	--	--	--	--	--	--	--
6	100	50K	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

Real Time Air Monitoring conducted during duration of job.

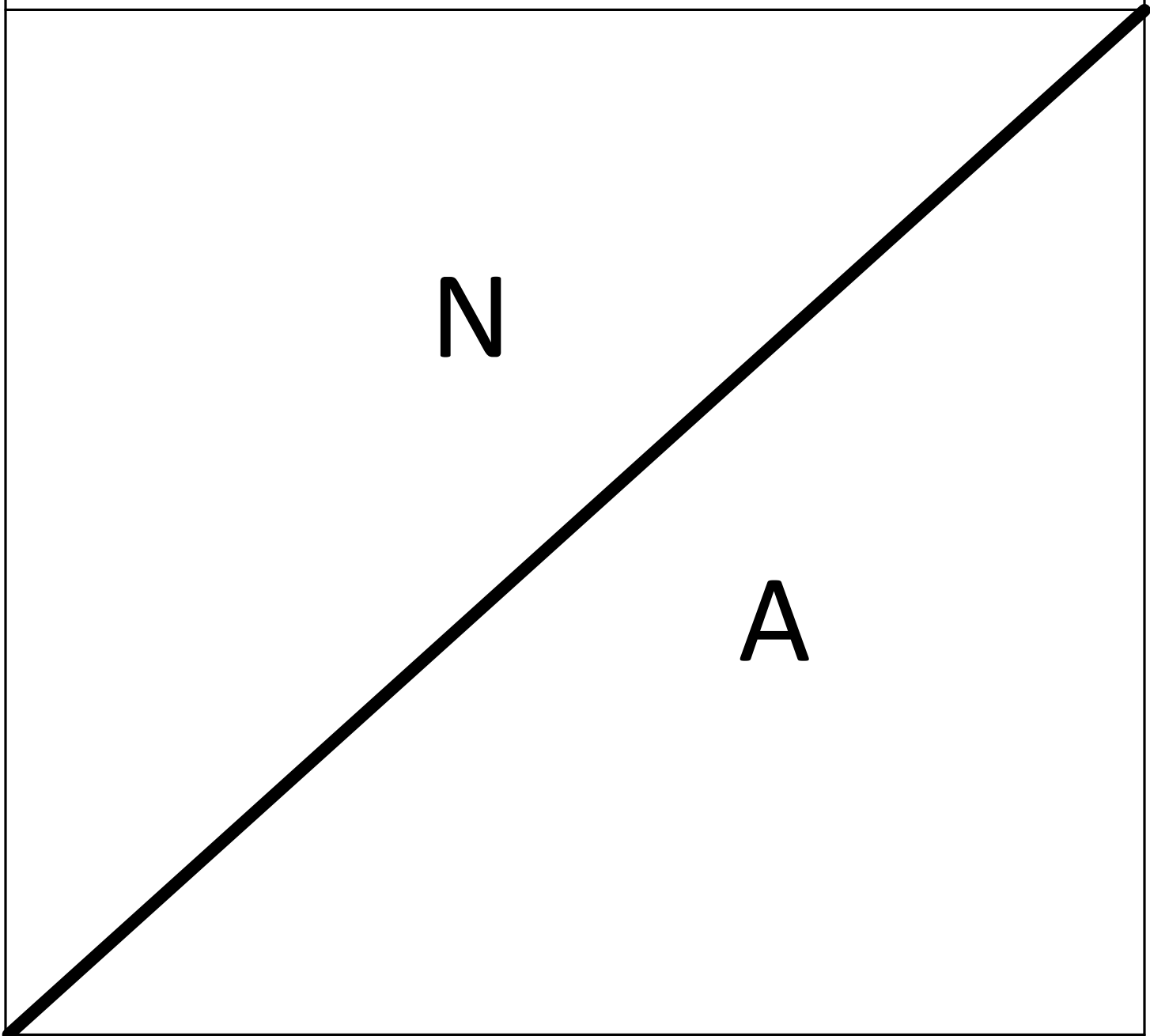
## Real Time Air Monitoring

Time	PAC (258117) (am)
Baseline	1
15 Min.	8
30 Min.	15
45 Min.	32
60 Min.	50
75 Min.	N/A

Smearable Net (DPM/100 cm<sup>2</sup>)  
Count Time N/A Min.

#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
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Comments:



Smearable Net (DPM/100 cm<sup>2</sup>)  
 Count Time N/A Min.

#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
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Survey Number

CH2M HILL BWXT West Valley, LLC

Location: Main Plant
Work Area: GOA

Purpose of Survey: Final survey of GOA prior to grouting. RWP #2020-3026

Additional Information Attached YES NO ON BACK

Instruments Used

Table with 4 columns: Instrument Type / Model, Serial #, Eff., and checkboxes for Scintillation, GM, Ionization, Proportional.

Instruments listed were source checked in accordance with applicable procedures

Main survey data table with columns: Area / Materials Surveyed, Smearable Net (DPM / 100 cm²), Direct Check Net CPM / probe, and Radiation Level (Reading, Distance, Cor. Factor, Cor. Reading).

Non-uniform Dose Rates Identified YES NO

Conversions: Beta Dose Rate (mrad) = (wo - wc) x 4 @ contact, (wo - wc) x 2 @ 1' or greater. 67,000 dpm beta = 1 mR/hr w.o. Probe Area: (Unless noted otherwise) Alpha probe is 50 cm², Beta probe is 15.5 cm².

Comments (If Any): A/S #61842 PAPER released to mask cage. Bkgd - 0 cpm alpha, 100 cpm beta / gamma

Recommendations: No Further Action Required Further Action Required

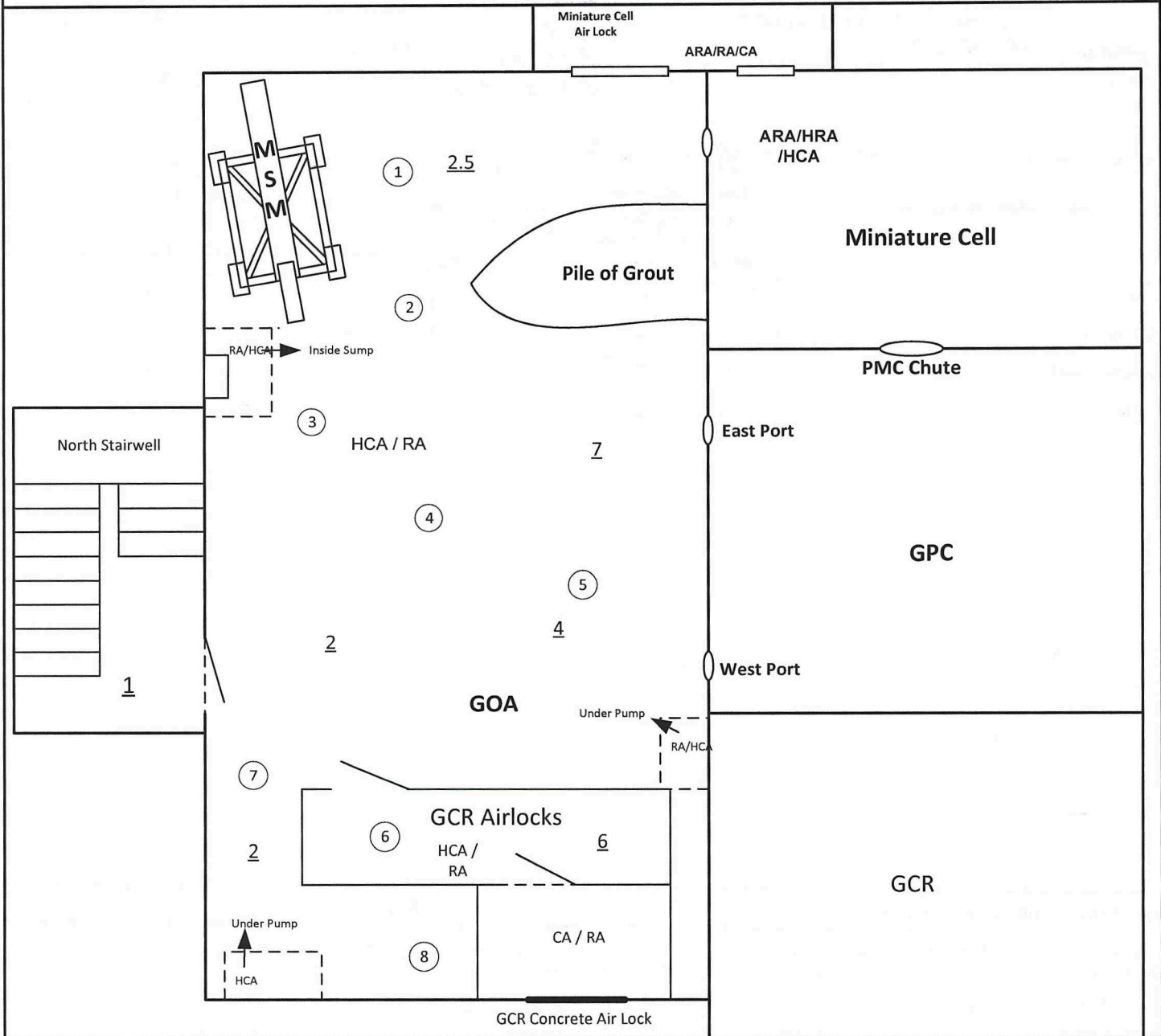
If Further Action Required, Describe

Technician Name (Print): BOYLE, KEVIN Date: 29 Oct, 2020 Signature: Kevin Boyle Time: 1430

Reviewer Name (Print): BIELA, JONATHAN Date: 10/29/20 Signature: J. Biela Time: 15:36



Comments: ARA - Airborne Radiation Area CA - Contamination Area  
 HCA - High Contamination Area RA - Raditaion Area  
 HRA - High Radiation Area # - Dose Rate in mR/hr



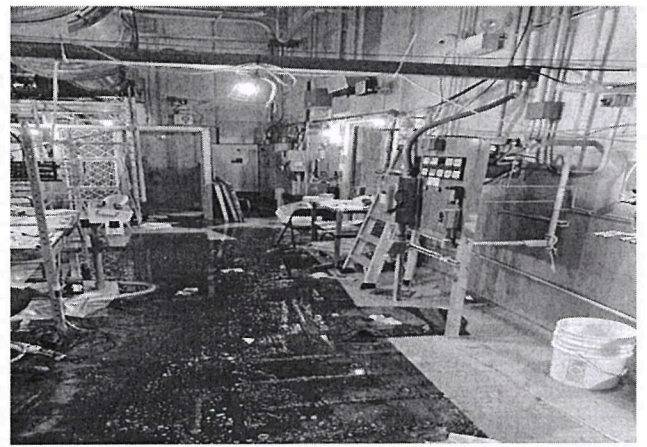
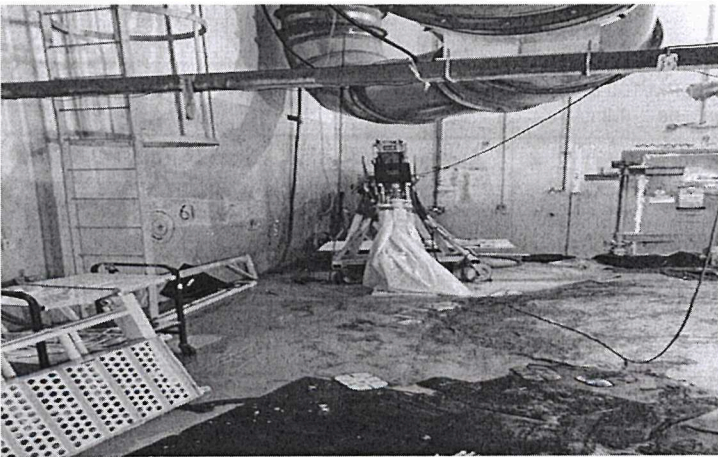
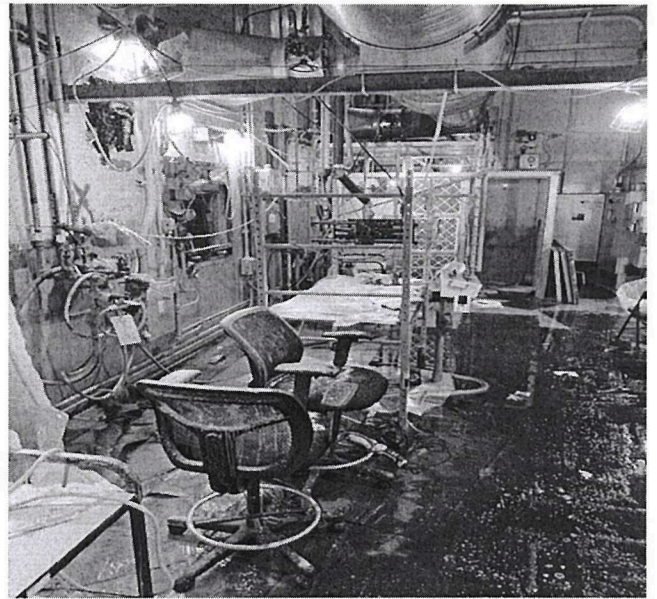
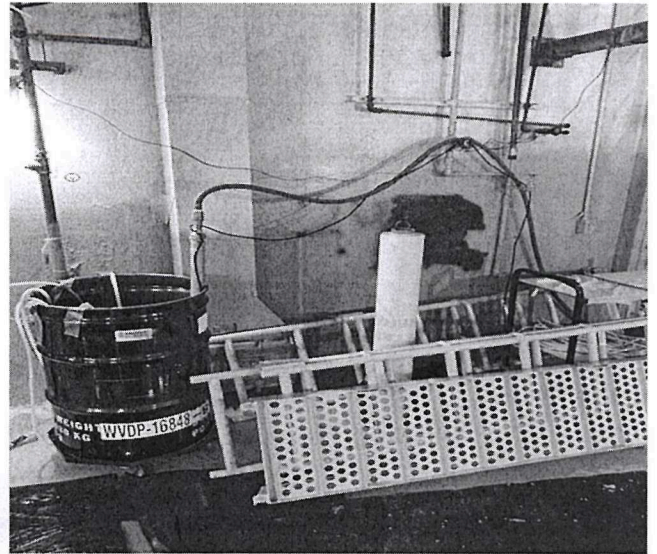
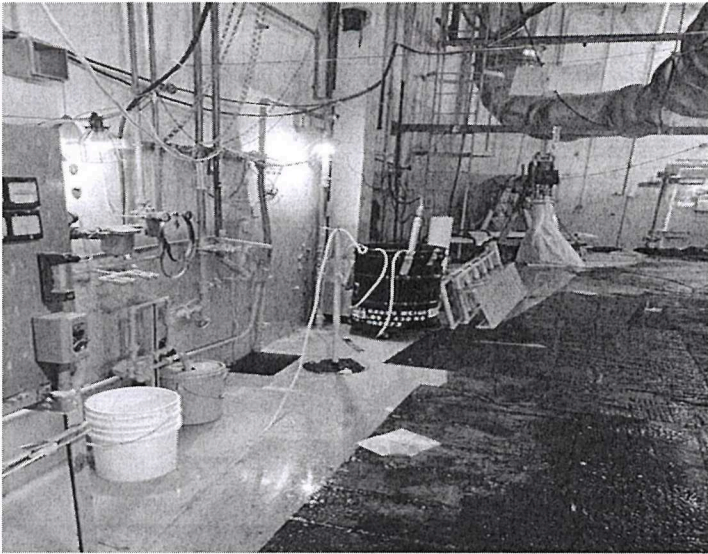
All smears field checked and converted

Smearable Net (DPM/100 cm<sup>2</sup>)  
 Count Time N/A Min.

#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
1	< 50	4k	7	< 50	16k	--	---	---	--	---	---	--	---	---
2	< 50	3k	8	< 50	8k	--	---	---	--	---	---	--	---	---
3	< 50	12k	---	---	---	--	---	---	--	---	---	--	---	---
4	< 50	40k	---	---	---	--	---	---	--	---	---	--	---	---
5	< 50	80k	---	---	---	--	---	---	--	---	---	--	---	---
6	< 50	24k	--	---	---	--	---	---	--	---	---	--	---	---



Comments: Current conditions in GOA and items left behind.





Comments: -----

**NA**

Smearable Net (DPM/100 cm<sup>2</sup>)  
 Count Time na Min.

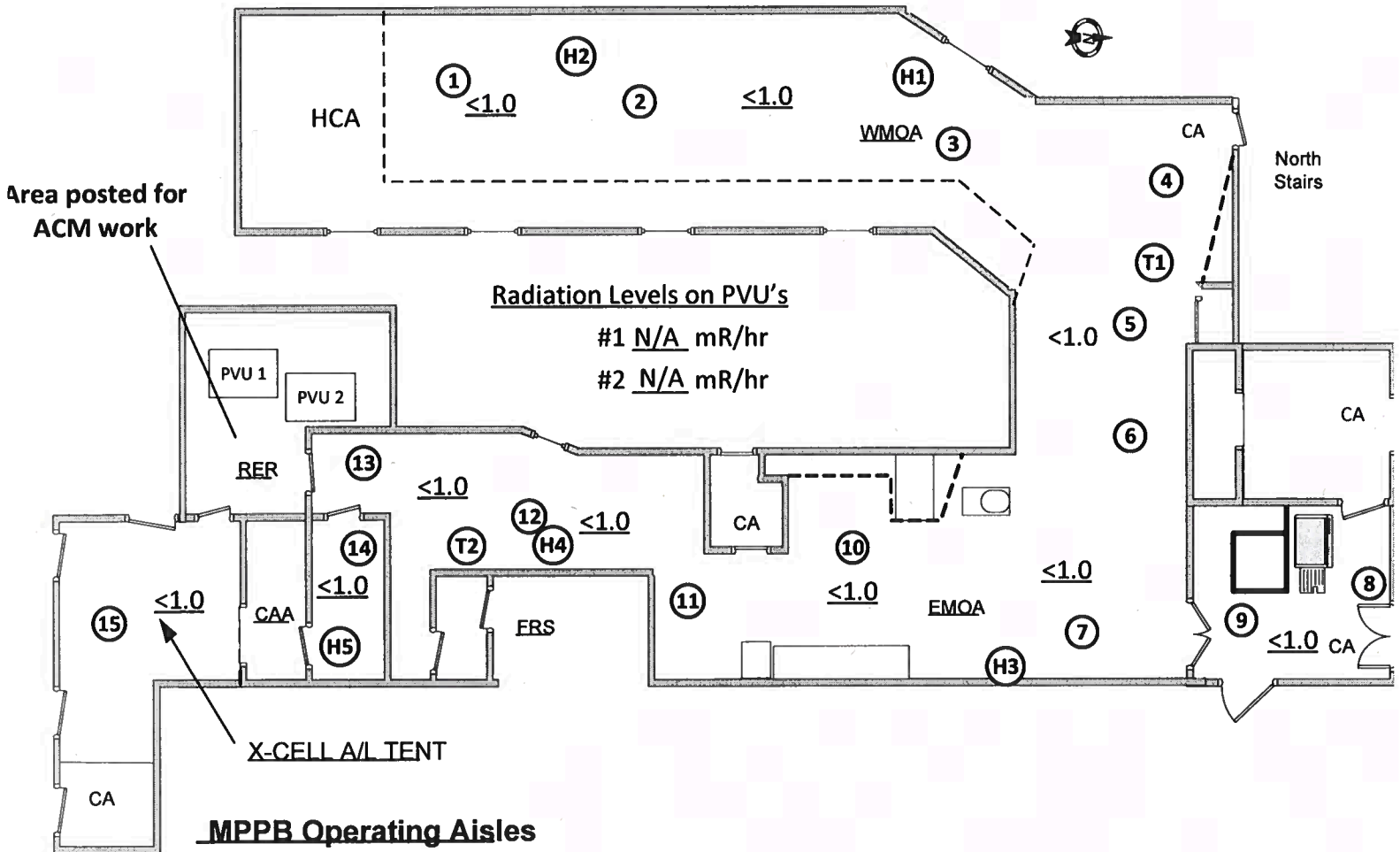
#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
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**Routine Radiation / Contamination Survey**

Survey Description: B Weekly. Survey Area: CAA, GOA, MOAS  
 Date: 8-10-22 Time: 1500  
 Survey Number: 32Bw2022 Surveyed by: (Print/Sign) EDWARD HART / *[Signature]*  
 Updated Map Drawing: 1 Dec 2020 Reviewed by: (Print/Sign) *[Signature]*

Instrument Serial	ALPHA: 262841	GM: 102979	ION: 9002	OTHER: ---
Numbers	TENN: 13450	ALPHA Eff: 27 %	BETA Eff: 36 %	

**Show Radiation Levels on Map**





Routine Radiation / Contamination Survey

Radiation Area boundaries confirmed  < 5 mR/hr. <u>EH</u> (initials)  Smears counted <u>1.25</u> min.  <u>NDA - No Detectable Activity</u>  LAW bkg. <u>80</u> cpm Beta  LAW bkg. <u>0</u> cpm Alpha  (Show Radiation Levels on Map)	* Contamination Levels (net dpm/100 cm2)			Large Area Wipes (net cpm)		
	No.	Alpha	Beta	No.	Alpha	Beta
	1	<50	<1000	---	----	----
	2	<50	<1000	---	----	----
	3	<50	<1000	---	----	----
	4	<50	<1000	---	----	----
	5	<50	<1000	---	----	----
	6	<50	<1000	---	----	----
	7	<50	<1000	---	----	----
	8	<50	<1000	---	----	----
	9	<50	<1000	---	----	----
	10	<50	<1000	---	----	----
	11	<50	<1000	---	----	----
	12	<50	<1000	---	----	----
	13	<50	<1000	---	----	----
	14	<50	<1000	---	----	----
	15	<50	<1000	---	----	----
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Remarks	* Horizontal Smears Contamination Levels (net dpm/100 cm2)			Horizontal Wipes Large Area Wipes (net cpm)		
	No.	Alpha	Beta	No.	Alpha	Beta
----	1	<50	<1000	---	----	----
----	2	<50	<1000	---	----	----
----	3	<50	<1000	---	----	----
----	4	<50	<1000	---	----	----
----	5	<50	<1000	---	----	----
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---- <th rowspan="2">Tools Surveyed</th> <th rowspan="2">Location</th> <th colspan="3">Contamination Levels (net dpm/100 cm2)</th>	Tools Surveyed	Location	Contamination Levels (net dpm/100 cm2)			
			Alpha	Beta		
----	1	CART	T1	<50	<1000	
----	2	CABINET	T2	<50	<1000	
----	---	----	----			
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February 21, 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: 502038  
SDG: 442-003169

Dear Mr. Connors:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 23, 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](http://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,

Taylor Cannon  
Project Manager

Purchase Order: CH-003169  
Enclosures



# Sample Summary



# Sample Summary Sheet

February 21, 2020

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**Release Number**

442

**Purchase Order Number**

CH-003169

**Charge #**

WV01.C2.06.01.04.10.02

**Description**

OGC floor core



# General Narrative

**Case Narrative  
for  
CH2M HILL BWXT West Valley, LLC  
SDG: 442-003169  
Work Order: 502038**

**February 21, 2020**

**Laboratory Identification:**

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

**Purchase Order**

CH-003169

**Release Number**

442

**Charge Number**

WV01.C2.06.01.04.10.02

**Summary**

**Sample Receipt** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on January 23, 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:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
502038001	OGC floor core

**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.



Taylor Cannon  
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.

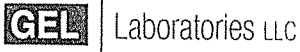
- P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.  
For HPLC, the difference is >70%.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# **Chain of Custody and Supporting Documentation**

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

502038

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 #: 442		* rad isotopes		7. Report Format Level: I [X] II [ ]	
8. Cognizant Engineer/Project: FDP						9. Priority Code: Routine [X]	
10. DQO/SAP#: WVDP-584				13.		report in uCi/g	
Sample ID#	Type	# Cont.	Pres.	Date	Time	pH	Comments
OGC floor core	Grab	1	none	12.30.19	14:19	n/a	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							
14. Phase (Circle one): <u>Solid</u> Liquid Sludge Other:							
Gross Wt (g)	33.0						
Tare Wt (g)	24.3						
Net Wt (g)	8.7						
15. Sample Bottle Size: 125ml Sample Bottle Type (Circle One): Glass <u>(Poly)</u>							
17. Chain-of-Custody Reviewed by: <u>Jean K. [Signature]</u> 16. <10 mCi Alpha NA [ ]							
19. Sample Custodian Signature/Date/Time							
Released by: <u>Dawn [Signature]</u> 12-31-19 0730 Received by: <u>Jean K. [Signature]</u> 12-31-19 0730							
Released by: <u>Jean K. [Signature]</u> 1-22-20 13:10 Received by: <u>[Signature]</u> 1/23/20 855							
Released by: _____ Received by: _____							
Released by: _____ Received by: _____							
20. Sample Receipt: Temperature _____ °C Cooler Seals Intact? Yes [ ] No [ ]							



**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>WVNS</u>	SDG/AR/COC/Work Order: <u>582038</u>
Received By: <u>George McAttee</u>	Date Received: <u>1/23/2020</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 9575</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>30</u> CPM ( <u>mR/Hr</u> ) Classified as: Rad 1 <u>Rad 2</u> <u>Rad 3</u> <u>see below</u>
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 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 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 checked="" type="checkbox"/>	<input 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>2°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>IR2-19</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 <input checked="" type="checkbox"/> NA (If yes, take to VOA Freezer)
				Do liquid VOA vials contain acid preservation? Yes    No <input checked="" type="checkbox"/> NA (If unknown, select No)
				Are liquid VOA vials free of headspace? Yes    No <input checked="" type="checkbox"/> NA
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: <u>2-1/23/20</u>
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):

Release 496 - X 10528 = Non-Rad

Releases 500 (12-5799V), 501 (17514), and 502 (SNWSACOMP) = Rad 2's

Releases 442 (OGC Floor core) and 454 (Mmicella) = Rad 3's

George McAttee 1/23/2020



# Certificates of Analysis

**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 21, 2020

Client Sample ID: OGC floor core  
 Sample ID: 502038001  
 Matrix: Solid  
 Collect Date: 30-DEC-19  
 Receive Date: 23-JAN-20  
 Collector: Client

Project: WVNS02501  
 Client ID: WVNS025

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>High Rad Testing</b>														
<i>Alphaspec Am241 Solid High Rad "As Received"</i>														
Americium-241		0.0117	+/-0.000340	1.81E-05	+/-0.00200	1.00E-05	uCi/g			JXB7	02/19/20	1517	1970427	1
<i>Alphaspec Pu238/239, 240, Solid High Rad "As Received"</i>														
Plutonium-238		0.000730	+/-0.000459	0.000300	+/-0.000514	1.00E-06	uCi/g			AXM6	02/20/20	2215	1971891	2
Plutonium-239/240		0.00141	+/-0.000620	0.000258	+/-0.000766	1.00E-06	uCi/g							
<i>Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"</i>														
Uranium-232		5.97E-05	+/-2.42E-05	2.41E-05	+/-2.60E-05	1.00E-06	uCi/g			JXB7	02/19/20	1521	1970434	3
Uranium-233/234		3.98E-05	+/-1.76E-05	1.20E-05	+/-1.87E-05	1.00E-06	uCi/g							
Uranium-235/236		1.38E-05	+/-1.09E-05	1.02E-05	+/-1.11E-05	1.00E-06	uCi/g							
Uranium-238		2.84E-05	+/-1.48E-05	1.01E-05	+/-1.55E-05	1.00E-06	uCi/g							
<i>GFPC, Sr90, solid High Rad "As Received"</i>														
Strontium-90		0.636	+/-0.0116	0.00173	+/-0.121	1.00E-04	uCi/g			AXM6	02/21/20	0639	1971823	4
<i>Gammasespec, Cs137 Only, solid High Rad "As Received"</i>														
Americium-241		0.00220	+/-0.00137	0.00138	+/-0.00138		uCi/g			JXB7	02/18/20	1433	1967079	5
Cesium-137		2.06	+/-0.00292	0.000394	+/-0.175	1.00E-05	uCi/g							
<i>Liquid Scint Pu241, Solid High Rad "As Received"</i>														
Plutonium-241		0.00727	+/-0.00227	0.00340	+/-0.00380	1.00E-05	uCi/g			JXB7	02/20/20	0641	1970438	6

**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	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 Solid High Rad "As Received"	1970427	115	(15%-125%)
Curium-243/244 Tracer		Alphaspec Am241 Solid High Rad "As Received"	1970427	89.7	(15%-125%)
Plutonium-236 Tracer		Alphaspec Pu238/239, 240, Solid High Rad "As Received"	1971891	117	(15%-125%)
Uranium-232 Tracer		Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"	1970434	111	(15%-125%)

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**Certificate of Analysis**

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

West Valley, New York 14171-9799

Report Date: February 21, 2020

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

Client Sample ID: OGC floor core  
 Sample ID: 502038001

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				
Uranium-235/236 Tracer	Alphaspec U232, 233, 234, 235, 238 Solid High Rad "As Received"						1970434	89.7	(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	92.4	(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

**GEL LABORATORIES LLC**

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**QC Summary**

Report Date: February 21, 2020

Page 1 of 5

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

Contact: Mr. William Connors

Workorder: 502038

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>High Rad Testing</b>											
Batch	1967079										
QC1204493539	502038001	DUP									
Americium-241		0.00220		0.00213	uCi/g	3.09		(0% - 100%)	JXB7	02/18/20	16:55
Cesium-137		2.06		2.08	uCi/g	1.06		(0%-20%)			
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%)			
QC1204493538	MB										
Americium-241			U	5.53E-06	uCi/g					02/18/20	16:54
Cesium-137			U	6.18E-07	uCi/g						
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%)			

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**QC Summary**

Workorder: 502038

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>High Rad Testing</b>											
Batch	1970427										
**Curium-243/244 Tracer	0.000286			0.000300	uCi/g		105	(15%-125%)	JXB7	02/19/20	15:17
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	0.000292		0.000290	uCi/g		104	(15%-125%)			
**Curium-243/244 Tracer	0.000288	0.000317		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		
Uranium-235/236		U	1.89E-06	U	3.49E-06	uCi/g	N/A		N/A		
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						

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**QC Summary**

Workorder: 502038

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>High Rad Testing</b>											
Batch	1970434										
Uranium-238	0.000341			0.000310	uCi/g		90.8	(75%-125%)	JXB7	02/19/20	15:21
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%)		
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

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**QC Summary**

Workorder: 502038

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>High Rad Testing</b>											
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%)			
QC1204504814	LCS										
Plutonium-238			U	3.00E-06	uCi/g					02/20/20	22:15
Plutonium-239/240	0.000251			0.000211	uCi/g		84.3	(75%-125%)			
QC1204504811	MB										
Plutonium-238			U	7.29E-06	uCi/g					02/20/20	22:15
Plutonium-239/240			U	-5.22E-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%)			

Notes:



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**QC Summary**

Workorder: 502038

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

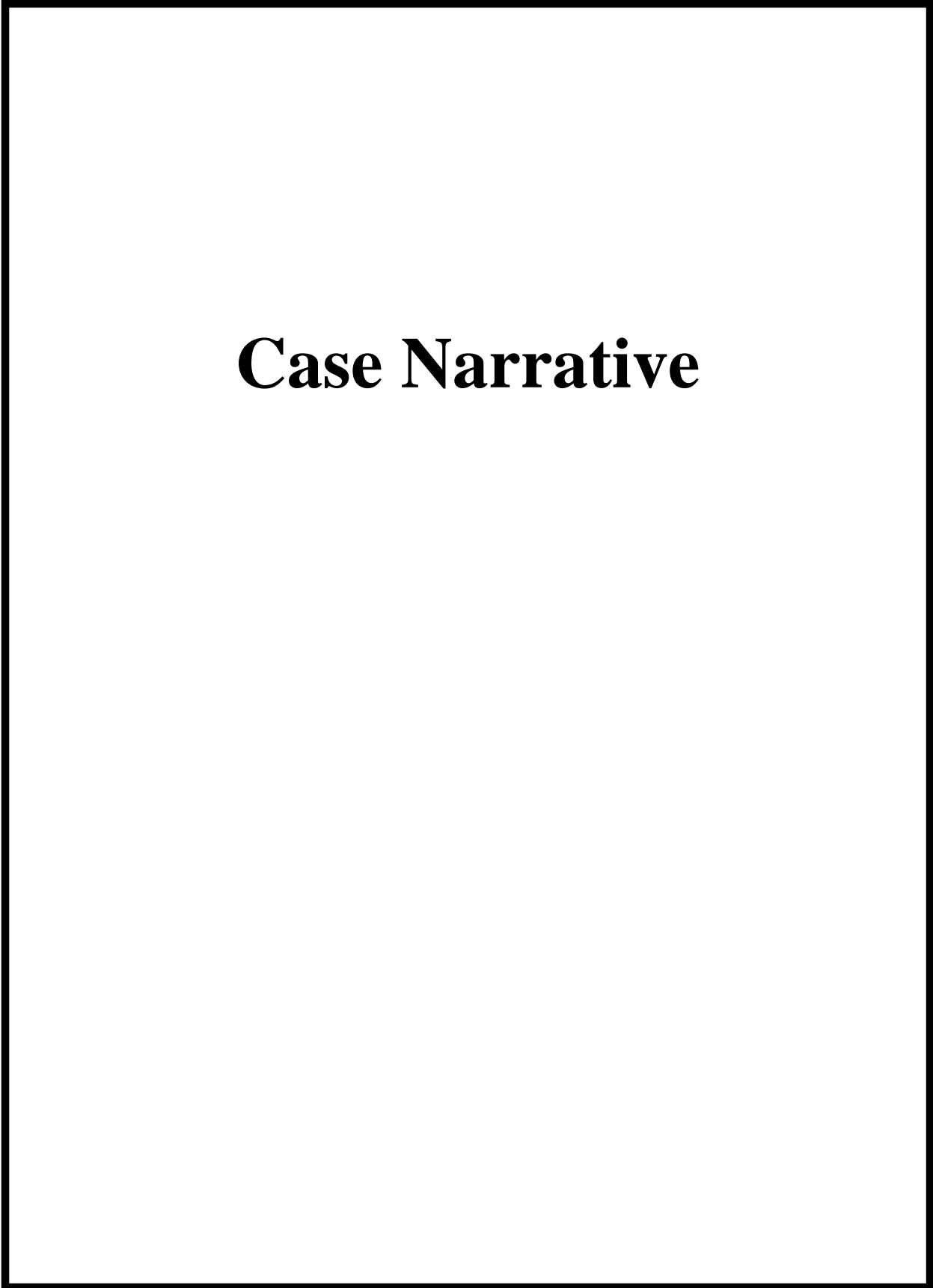
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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 21 February 2020**

<b>State</b>	<b>Certification</b>
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	SC000122019-30
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

# Radiological Analysis



# Case Narrative

**Radiochemistry**  
**Technical Case Narrative**  
**CH2M HILL BWXT West Valley, LLC**  
**SDG #: 442-003169**  
**Work Order #: 502038**

**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).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core
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.

**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

**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>
502038001	OGC floor core
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.

### 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

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
1204501318 (SNWSACOMPDUP)	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
	Uranium-238	Result -0.000000163 < MDA 0.0000057 > 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 Pu238/239, 240, 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).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core
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.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
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.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
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

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**

#### **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.

**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).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core

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:** 1967079

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core
1204493538	Method Blank (MB)
1204493539	502038001(OGC floor core) Sample Duplicate (DUP)



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**

radionuclides have been not identified and reported.

**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).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core
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.

**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).

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
502038001	OGC floor core
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 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: 442-003169 GEL Work Order: 502038

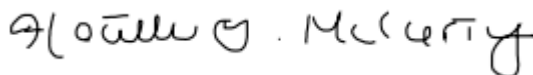
**The Qualifiers in this report are defined as follows:**

- \* 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: Heather McCarty****Date: 21 FEB 2020****Title: Analyst II**

# Prep Logbook

## Digestion for Soil

**Batch ID:** 1968509

Analyst: Andrew McKenzie (AXM6)

Method: Client Requested Procedure

Lab SOP: GL-RAD-A-015 REV# 18

Instrument: R2-38110047

**Due Dates for Lab:** 16-FEB-2020

**Package:** 18-FEB-2020

**SDG:** 20-FEB-2020

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	502038001	14-FEB-2020		0.3142	100	318.26862
2	502041001	14-FEB-2020		0.346	100	289.01734
3	503537001	14-FEB-2020		0.3796	100	263.43519

Reagent/Solvent Lot ID	Description	Amount	Comments:
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189227

Radiation and Contamination Survey Report

( Page 1 of 2 )

Survey Number

CH2M HILL B&W West Valley, LLC

Location: OFF GAS CELL  
Work Area: Off Gas Cell

Instruments Used

	Type / Model	Serial #	Eff. %
<input checked="" type="checkbox"/> Scintillation	Ludlum 177/2241	132601	10
<input checked="" type="checkbox"/> GM	Ludlum 177/3-2	126357	10
<input checked="" type="checkbox"/> Ionization	Eberline RO-20	3845	N/A
<input checked="" type="checkbox"/> Proportional	30-30	302416	$\alpha$ 31%
			$\beta$ 44%

Purpose of Survey: Verification Survey of OGC

Additional Information Attached  YES  NO  ON BACK


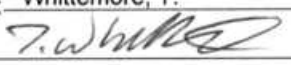
Area / Materials Surveyed	Smearable Net (DPM / 100 cm <sup>2</sup> ) Count Time 1.00 Min		Direct Check Net CPM / probe		Radiation Level mrad/hr			
	Alpha	Beta	Alpha	Beta	mR/hr Reading	Distance	Cor. Factor	Cor. Reading
Bagged Masks (x1)	<20	<200	--	--	<1.0	Contact	----	----
Eds (1), Radios (1), BZAS Pumps (1)	<20	<200	<5	<100	----	----	----	----
PAPR's (1)	<20	<200	<5	<100	----	----	----	----
Masks at SOP*	<50	<1,000	---	---	----	----	----	----
SOP WRPA/LWA	< 20	< 200	---	---	----	----	----	----
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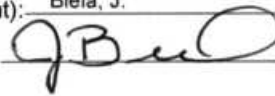
Non-uniform Dose Rates Identified  YES  NO

Conversions: Beta Dose Rate (mrad) = (wo - wc) x 4 @ contact, (wo - wc) x 2 @ 1' or greater. 67,000 dpm  $\beta\gamma$  = 1 mR/hr w.o.  
Probe Area: (Unless noted otherwise) Alpha probe is 50 cm<sup>2</sup>, Beta probe is 15.5 cm<sup>2</sup>.

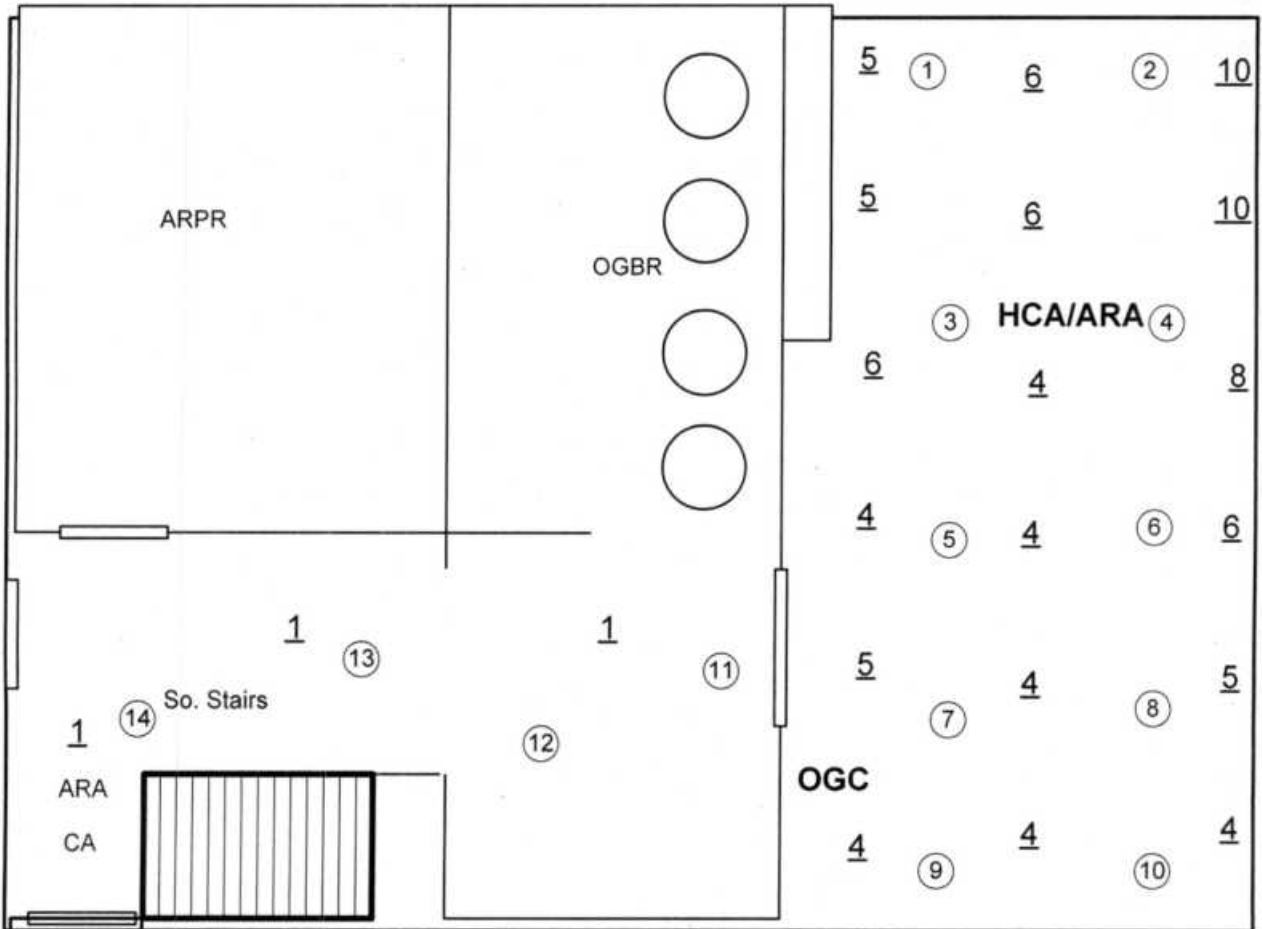
Comments (If Any): Total Dose ~ 2mrem A/S #'s - 47367  
\* - Smears field checked Background = 0 cpm, Beta/Gamma Background = 100 cpm

Recommendations:  No Further Action Required  Further Action Required  
If Further Action Required, Describe Work ongoing

Technician Name (Print): Nehl, J. Date: 10/04/17  
Signature:  Time: 1700  
Technician Name (Print): Whittemore, T. Date: 10/04/17  
Signature:  Time: 1700

Reviewer Name (Print): Biela, J. Date: 10/5/17  
Signature:  Time: 0845  
Technician Name (Print): \_\_\_\_\_ Date: \_\_\_\_\_  
Signature: \_\_\_\_\_ Time: \_\_\_\_\_

Comments: \_\_\_\_\_



RBA - Radiological Buffer Area  
 RMA - Radioactive Material Area  
 CA - Contamination Area  
 HCA - High CA  
 RA - Radiation Area  
 HRA - High RA  
 ARA - Airborne Radioactivity Area  
 --- - Radiological Boundary  
 #- Radiation Level in mR/hr.

△ - A/S Location

1-14 Field Checked

Smearable Net (DPM/100 cm<sup>2</sup>)  
 Count Time 1 Min.

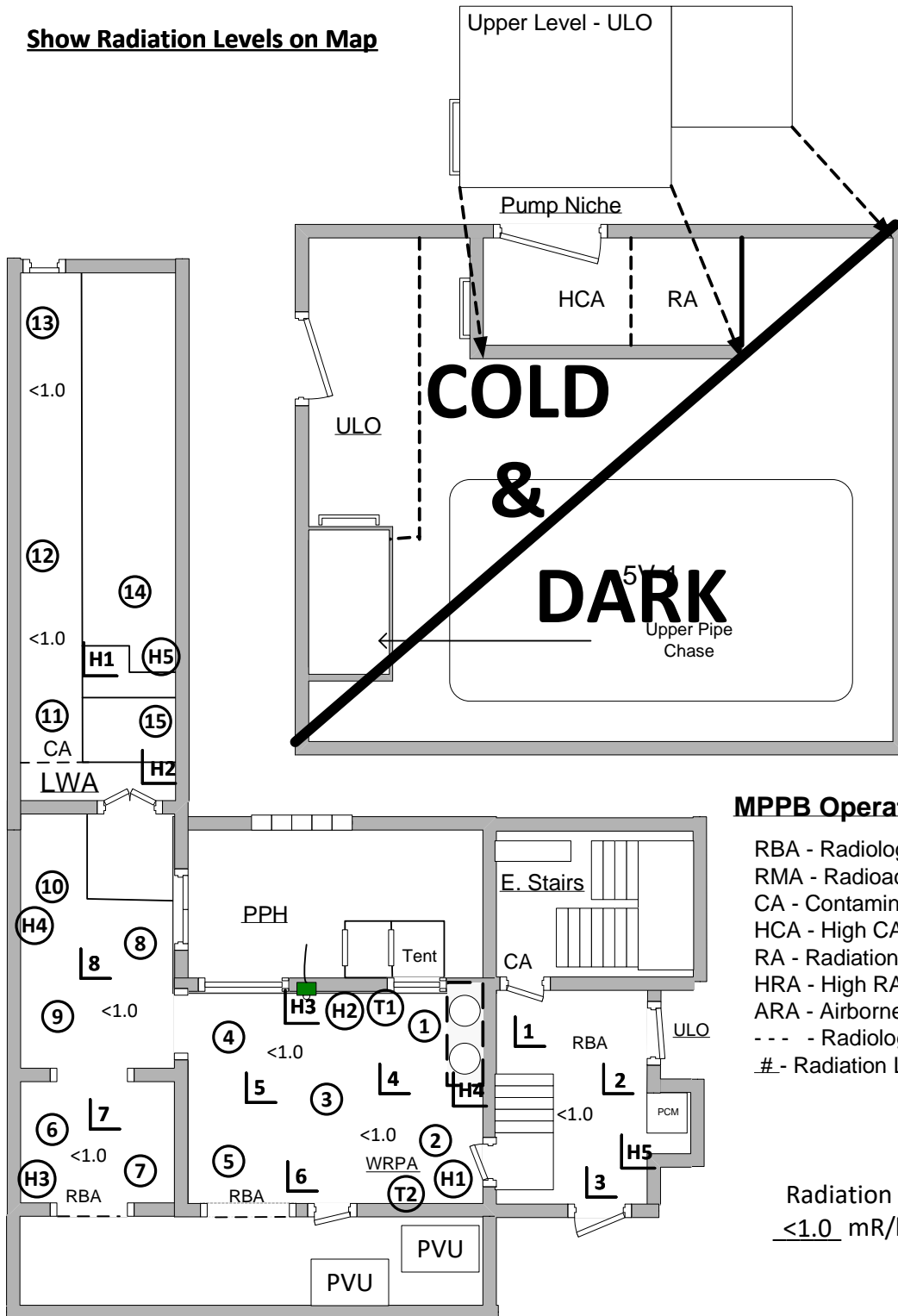
#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta	#	Alpha	Beta
1	400	30K	7	500	30K	13	< 50	< 1K	-	-	-	--	---	---
2	600	40K	8	400	40k	14	< 50	< 1K	-	-	-	--	--	--
3	600	40K	9	400	20k	15	< 20	< 200	--	--	--	--	--	--
4	400	20K	10	600	50K	-	-	-	--	--	--	--	--	--
5	400	30K	11	< 50	< 1K	-	-	-	--	--	--	--	--	--
6	600	40K	12	< 50	< 1K	-	-	-	--	--	--	--	--	--

**Routine Radiation / Contamination Survey**

Survey Description: H Weekly. Survey Area: LWA, WRPA, ULO  
 Date: 8-14-2022 Time: 20:00  
 Survey Number: 33Hw2022 Surveyed by: (Print/Sign) Hart, Edward  
 Updated Map Drawing: 1 Dec 2019 Reviewed by: (Print/Sign)

Instrument Serial	ALPHA: 23138	GM: 139888	ION: 9001	OTHER: ----
Numbers	TENN: 38981-2	ALPHA Eff: 26.1	%	BETA Eff: 34.2 %

**Show Radiation Levels on Map**



**MPPB Operating Aisles**

- RBA - Radiological Buffer Area
- RMA - Radioactive Material Area
- CA - Contamination Area
- HCA - High CA
- RA - Radiation Area
- HRA - High RA
- ARA - Airborne Radioactivity Area
- - Radiological Boundary
- # - Radiation Level in mR/hr.



Radiation Levels on PVUs  
<1.0 mR/hr, <1.0 mR/hr.



