

222-S LABORATORY

**FINAL REPORT FOR ANALYSIS OF CHEMICAL
RESIDUE FROM PFP HEPA FILTER BOX (FB-14),
234-5Z, ROOM 308****Document No.: 20150454 Rev. 1****Carolina E. Menjivar**

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222-S LABORATORY

FINAL REPORT FOR ANALYSIS OF CHEMICAL RESIDUE FROM PFP HEPA FILTER BOX (FB-14), 234-5Z, ROOM 308

1.0 INTRODUCTION

This report has been revised to include the results for Differential Scanning Calorimeter (DSC) testing. This analysis was requested after Rev. 0 was issued.

This final report presents the analytical results for two solid samples taken from the HEPA Filter Box (FB-14), 234-Z, Room 308 at the Plutonium Finishing Plant (PFP). The samples were analyzed in accordance with F13-006, *HEPA Filter Box (FB-14), 234-5Z, Rm 308 – Other Solid Sampling, Sampling Authorization Form (SAF)*; ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory (QAPP)*; PFP-LOI-12-0004, *Letter of Instruction for Analysis of Chemical Residue in FB-14 (LOI)*; SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; DOE/RL-2004-29, *Sampling and Analysis Plan for the Plutonium Finishing Plant, Above-Grade Structures (SAP)*; and the additional guidance given by the customer point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

- Attachment 1 Data Summary Report
- Attachment 2 Analysis Date and Holding Time Report
- Attachment 3 Correspondence
- Attachment 4 Receipt Paperwork

2.0 SAMPLE RECEIPT

Two samples were received at the 222-S Laboratory on March 25, 2015. The samples were received in good condition, with adequate paperwork, and stored under refrigeration upon receipt. Samples were received 20 days after sampling.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for the requested analytes listed in the SAF and LOI.

The “Det Limit” column in Attachment 1 contains the method detection limit (MDL) for inorganic analytes or minimum detectable activity (MDA) for radionuclides.

In Attachment 1, the column labeled “A#” indicates the aliquot class or the method used for sample preparation before analysis. The aliquot classes are defined as follows:

“A” indicates samples were prepared by SW-846 3050B.

“Hg” indicates samples were acid-digested using SW-846 7471A. “W” indicates samples were prepared by a water digest.

“Z” indicates samples were prepared by zirconium fusion digest.

The “Qual Flags” column in Attachment 1 contains data qualifier flags from FEAD CP-15383, *Common Requirements of the Format for Electronic Analytical Data (FEAD)*, which are defined as follows:

“B” for inorganic results is used to indicate that the reported result should be considered an estimate because it was below the quantitation limit. The “B” flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit.

“C” indicates the blank result was greater than 20% of the sample result.

“N” indicates the spike and/or spike duplicate sample recovery is outside control limits.

“M” for inorganic results is used to indicate RPD outside of range.

“U” for all results is used to indicate that the reported result was less than the calculated detection limit.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 INORGANIC ANALYSES

3.1.1 pH Analysis

The pH analysis was performed on direct aliquots of the samples. The SAF lists a pH holding time of “as soon as possible”. However, the samples were received 20 days after sampling, during a time when the laboratory was experiencing an electrical outage which was extended for a period of three weeks. Therefore, the laboratory completed the pH measurements as soon as practically possible. The analysis time and holding time report is presented in Attachment 2.

3.1.2 Mercury

Analysis for mercury by cold vapor atomic absorption was performed on acid-digested aliquots. The required detection limit (RDL) was met. The 28-day SW-846 holding time for mercury analysis was exceeded, since the samples were received at the laboratory during the laboratory outage period and 20 days after sampling (see Attachment 2). All quality control (QC) requirements were met.

3.1.3 Ion Chromatography

The IC analysis for anions was performed on water-digested aliquots of the samples. The required analytes were nitrate and oxalate. Nitrate was detected in the preparation blank above the MDL, but below the quantitation limit; therefore reanalysis was not required. Since the concentration level of nitrate in the preparation blank was less than 20% of the sample results, flagging of the data was not required.

The matrix spike (MS) recovery for oxalate exceeded the control limit in the SAP of 70%-130%, at 69.7 %. The spike level for oxalate was less than the quantitation limit and the sample results were below the MDL. Oxalate results has been flagged with an "N".

All other quality control (QC) requirements listed in the SAP and the QAPP were met.

3.1.4 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analysis was performed on acid-digested aliquots of the solid samples. All analyses met the holding time requirement.

Since there were large concentrations of zinc and magnesium present in the samples, it was necessary to analyze the samples at a 10X dilution. For this reason, the ICP/AES analysis was unable to meet the RDLs for beryllium, silver, and thallium. These elements were analyzed by inductively coupled plasma/spectrometry (ICP/MS). The RDLs for aluminum and sodium were not met by ICP/AES; however, aluminum and sodium could not be reanalyzed by ICP/MS and were reported by ICP/AES. In addition, manganese was reanalyzed by ICP/MS because the ICP/AES analysis resulted in an interference check standard above the EQL.

Batch 54469: Calcium, chromium, magnesium, and selenium were detected in the preparation blank at a concentration level above the MDL but below the estimated quantitation limit (EQL). All blank concentration levels were below 20% of the sample results, except for calcium, which was greater than 20% of the result in sample S15M000047 (B30BW6). A "C" Flag has been applied to the calcium result for this sample. Since the detected concentrations of these analytes in the preparation blank were below the EQL, the quality of the data was not affected, and reanalysis was not required.

The relative percent difference (RPD) between the sample and duplicate results for aluminum, chromium, and copper exceeded the 30% requirement in the SAP. Since the sample result for aluminum and copper were below the quantitation limit, this criterion does not apply. For chromium, the results have been flagged with an "M".

The MS recoveries for magnesium, and sodium, exceeded the 70%-130% requirement in the SAP. However since the spike levels for these analytes were less than 25% of the sample result, this criterion does not apply.

Batch 54659: This analytical batch contains results for zinc and lead only. The MS recovery for zinc exceeded the 70-130% requirement. Since zinc concentrations in the samples were four

times the spike concentration, this criterion does not apply. The quality of the data was not affected, reanalysis was not necessary, and flagging was not required.

All other quality control (QC) requirements listed in the SAP and the QAPP were met.

3.1.5 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS analysis was performed on acid-digested aliquots of the solid samples. The actinides, ^{233}U , ^{234}U , ^{235}U , ^{238}U , ^{242}Pu and the metals, antimony, beryllium, manganese, silver and thallium were analyzed using this method.

Metals analysis: Thallium was detected in the preparation blank at a concentration above the MDL but below the quantitation limit. Since the sample results for thallium were below the MDL, the quality of the data was not affected and reanalysis was not required. Manganese result for sample S15M000047 (B30BW6) was above the calibration range. However, this result was compared to the manganese result obtained by ICP/AES, and confirmed that both methods yielded similar results. Therefore, the manganese result by ICP/MS was reported in the final report. RDLs for antimony, beryllium, manganese, silver and thallium were met, as well as, holding time and all other QC requirements listed in the SAP and QAPP.

Actinides Analysis: U^{235} was detected in the ending calibration blank at a concentration level above the MDL but below the estimated quantitation limit, and below 20% of the sample results. Therefore, no “C” flags were applied and the usability of the data was not affected.

The RDLs were met for ^{235}U , and ^{238}U , but were not met for ^{234}U and ^{242}Pu . There were no stated RDL in the SAP for ^{233}U . All other QC requirements listed in the SAP and the QAPP were met.

For Actinide analysis, direct is the most accurate type of calibration; however, standard material is not commercially available for all isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument’s response to another isotope of the same element, which is known as “isotopic substitution” and is an indirect method of calibration. Direct calibration standards were used for ^{233}U , ^{235}U , ^{238}U , and ^{242}Pu . Isotopic substitution calibrations were performed for U^{234} as listed in the table below.

Table 1. Inductively Coupled Plasma/Mass Spectroscopy Standards and Spikes

Standard Type	Isotopes
Direct calibration standards	^{233}U , ^{235}U , ^{238}U , ^{242}Pu
Matrix spike, laboratory control standard, and calibration verification standards	^{233}U , ^{235}U , ^{238}U , ^{242}Pu
Isotope substitution	^{234}U (^{235}U),

3.1.6 Differential Scanning Calorimeter (DSC)

The DSC analysis was performed on direct aliquots of the samples. Indium check standards were used as Laboratory Control Standards (LCS), and the results for the LCS were found within required quality control limits of 90-110%.

During the heating process, when the temperature was at 160°C, sample S15M000037 (B30BW6) reacted and came out of the sample pan. The instrument was recalibrated, and the sample was reanalyzed at a slower heating rate of 1°C/min. A small amount of sample still came out of the pan, but did not become in contact with the sensor, and the instrument remained in calibration. A preliminary result was calculated by the chemist/scientist (~46.287 Joules/g), but it was not a conclusive result, therefore it was not reported as final result. The sample was analyzed again for the third time, yielding a final result of 67.95 Joules/g. This time, two exothermic reactions occurred: at 159.4°C with a 46.24 Joules/g of energy, and at 185°C with 21.71 Joules/g of energy, giving a total energy result of 67.95 Joules/g.

For sample S15M000049 (B30BW7), there was no indication of an exothermic reaction during the heating process. Therefore, the final result was reported as 0 Joules/g.

3.2 RADIOCHEMISTRY ANALYSES

3.2.1 Total Alpha/Total Beta

The total alpha/total beta analysis was performed on acid-digested aliquots. All QC requirements listed in the SAP and the QAPP were met.

3.2.2 Strontium-89/90

The ^{89/90}Sr analysis was performed on fusion-digested samples. All QC requirements listed in the SAP and the QAPP were met. The required detection limit for ^{89/90}Sr listed in the SAP was met.

The RPD between sample and sample duplicate exceeded the 30% requirement, at 44.5%. However, the counting error was higher than 30%; therefore, this criterion does not apply.

3.2.3 Americium-241

The ²⁴¹Am analysis for the solid samples was performed on fusion-digested aliquots. The preparation blank contained ²⁴¹Am at a level above the MDA, but below the quantitation limit; therefore, the usability of the data was not affected and reanalysis was not required. Since the blank activity levels less than 20% of the sample result, no flag was applied. All other QC requirements listed in the SAP and the QAPP were met.

3.2.4 Plutonium-238 and Plutonium-239/240

The ²³⁸Pu and ^{239/240}Pu analysis was performed on the fusion-digest. All QC requirements in the SAP and the QAPP were met.

3.2.5 Plutonium-241

The ^{241}Pu analysis by Liquid Scintillation Counting (LSC) was performed on fusion-digested aliquots. All QC requirements in the SAP and the QAPP were met.

4.0 PROCEDURES

Table 2 lists the procedures used in preparation and analysis of the samples contained in this report.

Table 2. Analytical Procedures

Analysis	Reference	Preparation Method	Analysis Procedure
Inorganic Analyses			
pH	SW-846 9045D	N/A	LA-212-105 Rev. I-1
Hg	SW-846 7471A	Acid digest – LA-325-110, Rev. CB-1	LA-325-110, Rev. CB-1
IC – Anions	SW-846 9056A	Water digest – LA-504-101, Rev. N-1	LA-533-166, Rev. C-1
ICP/AES – Metals	SW-846 6010C	Acid digest – LA-505-163, Rev. I-2; SW-846 3050B	LA-505-174, Rev. B-3
ICP/MS – Actinides & Metals	SW-846 6020A	Acid digest – LA-505-163, Rev. I-2; SW-846 3050B	LA-506-103, Rev. D-0
DSC	N/A	N/A	LA-514-115, Rev. H-1
Radiochemical Analyses			
Total Alpha/Beta	N/A	Separation – LA-508-101, Rev. P-1 Acid digest – LA-505-163, Rev. I-2; SW-846 3050B	LA-508-124, Rev. C-2
$^{89/90}\text{Sr}$	N/A	Separation – LA-220-101, Rev. K-2 Fusion digest – LA-549-141, Rev. N-2	LA-508-124, Rev. C-2
$^{238, 239/240}\text{Pu}$	N/A	Separation – LA-953-104, Rev. J-1 Fusion digest – LA-549-141, Rev. N-2	LA-508-168, Rev. B-1
^{241}Am	N/A	Separation – LA-953-104, Rev. J-1 Fusion digest – LA-549-141, Rev. N-2	LA-508-168, Rev. B-1
^{241}Pu	N/A	Separation- LA-953-104, Rev. J-1 Fusion digest-LA-549-141, Rev. N-2	LA-508-121. Rev. H-1

N/A – No reference method for this analysis

5.0 REFERENCES

ATL-MP-1011, 2014, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 12-3, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

FEAD CP-15383, 2007, *Common Requirements of the Format for Electronic Analytical Data (FEAD)*, Rev. 8, CH2M HILL Plateau Remediation Company, Richland, Washington.

DOE/RL-2004-29, 2005, *Sampling and Analysis Plan for the Plutonium Finishing Plant, Above-Grade Structures*, Rev. 0, U.S. Department of Energy, Richland, Washington.

F13-006, *Sampling Authorization Form*, HEPA Filter Box (FB-14), 2345Z, Rm 308- Other Sampling, CH2M Hill Plateau Remediation Company, Richland, Washington.

PPF-LOI-12-0004, 2014, *Letter of Instruction for Analysis of Chemical Residue in FB-14(LOI)*, Rev. 1, CH2M HILL Plateau Remediation Company, Richland, Washington.

SW-846, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

Attachment 1

DATA SUMMARY REPORT

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW6

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Alpha and Beta															
S15M000047		A	12587-46-1	Gross alpha	uCi/g	93.1	<3.07E-07	0.136	0.110	0.123	20.9	83.3	4.97E-05	1.595	
S15M000047		A	12587-47-2	Gross beta	uCi/g	95.7	<1.06E-06	0.0188	0.0163	0.0175	14.1	104	1.32E-04	3.729	
ICP-RCRA Metals															
S15M000047		A	7429-90-5	Aluminum	ug/g	98.1	<0.0140	41.7	28.7	35.2	36.8	106	27.9	n/a	B
S15M000047		A	7440-38-2	Arsenic	ug/g	94.9	<5.00E-03	<9.96	n/a	n/a	n/a	98.1	9.96	n/a	U
S15M000047		A	7440-39-3	Barium	ug/g	98.1	<1.00E-03	5.87	6.03	5.95	2.73	102	1.99	n/a	B
S15M000047		A	7440-70-2	Calcium	ug/g	104	0.0989	782	n/a	n/a	n/a	112	177	n/a	CB
S15M000047		A	7440-43-9	Cadmium	ug/g	99.0	<1.00E-03	17.3	17.2	17.3	0.186	105	1.99	n/a	B
S15M000047		A	7440-48-4	Cobalt	ug/g	98.7	<1.00E-03	32.8	31.7	32.3	3.55	102	1.99	n/a	
S15M000047		A	7440-47-3	Chromium	ug/g	95.4	2.41E-03	513	375	444	31.1	112	1.99	n/a	M
S15M000047		A	7440-50-8	Copper	ug/g	97.1	<2.00E-03	9.32	4.80	7.06	63.9	103	3.98	n/a	B
S15M000047		A	7440-09-7	Potassium	ug/g	98.6	<0.0220	<43.8	<43.8	n/a	n/a	109	43.8	n/a	U
S15M000047		A	7439-95-4	Magnesium	ug/g	99.6	0.0113	7.31E+04	7.38E+04	7.34E+04	0.924	-8.72	17.9	n/a	
S15M000047		A	7440-23-5	Sodium	ug/g	99.2	<0.0920	4.82E+03	4.92E+03	4.87E+03	2.12	131	183	n/a	
S15M000047		A	7440-02-0	Nickel	ug/g	96.4	<1.00E-03	1.22E+03	1.12E+03	1.17E+03	8.55	107	1.99	n/a	
S15M000047		A	7439-92-1	Lead	ug/g	103	<0.0100	189	177	183	6.49	110	19.9	n/a	B
S15M000047		A	7782-49-2	Selenium	ug/g	98.6	4.14E-03	<7.97	<7.96	n/a	n/a	99.5	7.97	n/a	U
S15M000047		A	7440-24-6	Strontium	ug/g	96.8	<1.00E-03	3.15	3.04	3.10	3.58	100	1.99	n/a	B
S15M000047		A	7440-62-2	Vanadium	ug/g	96.8	<1.00E-03	<1.99	<1.99	n/a	n/a	100	1.99	n/a	U
S15M000047		A	7440-66-6	Zinc	ug/g	97.8	<0.0160	4.32E+04	4.04E+04	4.18E+04	6.86	859	31.9	n/a	
ICP/MS															
S15M000047		A	13968-55-3	Uranium-233	ug/g	98.0	<5.00E-05	<9.96E-03	<9.95E-03	n/a	n/a	103	9.96E-03	n/a	U
S15M000047		A	13966-29-5	Uranium-234	ug/g	n/a	<1.08E-06	2.90E-04	<2.15E-04	n/a	n/a	n/a	2.15E-04	n/a	
S15M000047		A	15117-96-1	Uranium-235	ug/g	107	<1.08E-06	2.29E-03	2.12E-03	2.20E-03	8.07	101	2.15E-04	n/a	
S15M000047		A	U-238	Uranium-238	ug/g	104	<8.36E-06	1.72E-03	<1.66E-03	n/a	n/a	106	1.67E-03	n/a	
S15M000047		A	13982-10-0	Plutonium-242	ug/g	106	<1.30E-04	<0.0259	<0.0259	n/a	n/a	109	0.0259	n/a	U
S15M000047		A	7440-22-4	Silver	ug/g	98.9	<8.00E-04	0.161	<0.159	n/a	n/a	96.2	0.159	n/a	B
S15M000047		A	7440-41-7	Beryllium	ug/g	92.7	<2.00E-04	<0.0398	<0.0398	n/a	n/a	90.9	0.0398	n/a	U

NA = Not Analyzed, ND = Not Detectec

U - < Det Limit

C - Inorganic Blank Contamination

N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW6

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
ICP/MS															
S15M000047		A	7439-96-5	Manganese	ug/g	104	<2.60E-03	339	320	330	5.79	101	0.518	n/a	
S15M000047		A	7440-28-0	Thallium	ug/g	98.8	1.77E-03	<0.0797	<0.0796	n/a	n/a	103	0.0797	n/a	U

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
DSC Exotherm by TA															
S15M000037			DSC-01	DSC Exotherm	J/g	99.5	n/a	68.0	n/a	n/a	n/a	n/a	0.0100	n/a	
pH on Solid Samples															
S15M000037			PH	pH	unitless	n/a	n/a	4.69	4.70	4.70	0.213	n/a	0.0100	n/a	

Sample Portion: Sb Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
ICP/MS															
S15M000045		A	7440-36-0	Antimony	ug/g	94.1	<6.00E-04	1.44	1.30	1.37	10.3	98.3	0.121	n/a	

Sample Portion: Water Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Anions and Small Organic Acids															
S15M000046		W	338-70-5	Oxalate	ug/g	97.0	<9.00E-03	<636	n/a	n/a	n/a	69.7	636	n/a	UN
S15M000046		W	14797-55-8	Nitrate	ug/g	96.4	0.101	4.45E+05	4.42E+05	4.43E+05	0.630	119	1.54E+03	n/a	
Mercury by CVAA															
S15M000048		HG	7439-97-6	Mercury	ug/g	106	<1.10E-05	0.0277	0.0293	0.0285	5.62	96.9	1.93E-03	n/a	B

Sample Portion: Zr Fusion Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Am241,Cm243 by TRU-Spec Resin															
S15M000038		Z	14596-10-2	Americium-241	uCi/g	109	9.46E-05	0.152	0.133	0.142	13.9	n/a	7.66E-05	0.68	
S15M000038		Z	14993-75-0T	Americium-243T	%	n/a	92.180	98.740	104.33	101.54	5.5055	n/a	n/a	n/a	
Env Sr-89/90 for Solids															
S15M000038		Z	SR-89/90	Strontium-89/90	uCi/g	101	<8.77E-04	7.72E-04	1.21E-03	9.93E-04	44.5	n/a	2.67E-04	59.781	

NA = Not Analyzed, ND = Not Detectec

U - < Det Limit

C - Inorganic Blank Contamination

N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW6

Sample Portion: Zr Fusion Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Env Sr-89/90 for Solids															
S15M000038		Z	7440-24-6C	Strontium-C	%	n/a	81.3	81.0	81.7	n/a	n/a	n/a	n/a	n/a	
Plutonium-241 by LSC															
S15M000038		Z	14119-32-5	Plutonium-241	uCi/g	90.8	<0.0129	0.191	0.175	0.183	8.74	92.6	8.25E-03	6.624	
S15M000038		Z	15411-92-4	Plutonium-236T	%	n/a	70.9	111	98.1	n/a	n/a	n/a	n/a	n/a	
Pu238,239 by TRU-SPEC Resin															
S15M000038		Z	PU-239/240	Plutonium-239/240	uCi/g	99.7	<1.63E-04	0.300	0.235	0.268	24.2	n/a	1.28E-04	0.51	
S15M000038		Z	15411-92-4	Plutonium-236T	%	n/a	63.8	87.0	84.9	n/a	n/a	n/a	n/a	n/a	
S15M000038		Z	13981-16-3	Plutonium-238	uCi/g	n/a	<1.73E-04	9.90E-03	8.03E-03	8.96E-03	20.8	n/a	1.58E-04	2.89	

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

C - Inorganic Blank Contamination

N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW7

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Alpha and Beta															
S15M000053		A	12587-46-1	Gross alpha	uCi/g	93.1	<3.07E-07	0.0673	n/a	n/a	n/a	n/a	5.32E-05	2.365	
S15M000053		A	12587-47-2	Gross beta	uCi/g	95.7	<1.06E-06	5.62E-03	n/a	n/a	n/a	n/a	1.34E-04	7.355	
ICP-RCRA Metals															
S15M000053		A	7429-90-5	Aluminum	ug/g	98.1	<0.0140	<28.0	n/a	n/a	n/a	n/a	28.0	n/a	U
S15M000053		A	7440-38-2	Arsenic	ug/g	94.9	<5.00E-03	22.7	n/a	n/a	n/a	n/a	10.0	n/a	B
S15M000053		A	7440-39-3	Barium	ug/g	98.1	<1.00E-03	3.02	n/a	n/a	n/a	n/a	2.00	n/a	B
S15M000053		A	7440-70-2	Calcium	ug/g	104	0.0989	<178	n/a	n/a	n/a	n/a	178	n/a	U
S15M000053		A	7440-43-9	Cadmium	ug/g	99.0	<1.00E-03	380	n/a	n/a	n/a	n/a	2.00	n/a	
S15M000053		A	7440-48-4	Cobalt	ug/g	98.7	<1.00E-03	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S15M000053		A	7440-47-3	Chromium	ug/g	95.4	2.41E-03	548	n/a	n/a	n/a	n/a	2.00	n/a	M
S15M000053		A	7440-50-8	Copper	ug/g	97.1	<2.00E-03	99.2	n/a	n/a	n/a	n/a	4.00	n/a	
S15M000053		A	7440-09-7	Potassium	ug/g	98.6	<0.0220	<44.0	n/a	n/a	n/a	n/a	44.0	n/a	U
S15M000053		A	7439-95-4	Magnesium	ug/g	99.6	0.0113	385	n/a	n/a	n/a	n/a	18.0	n/a	
S15M000053		A	7440-23-5	Sodium	ug/g	99.2	<0.0920	<184	n/a	n/a	n/a	n/a	184	n/a	U
S15M000053		A	7440-02-0	Nickel	ug/g	96.4	<1.00E-03	200	n/a	n/a	n/a	n/a	2.00	n/a	
S15M000053		A	7439-92-1	Lead	ug/g	103	<0.0100	4.20E+03	n/a	n/a	n/a	n/a	20.0	n/a	
S15M000053		A	7782-49-2	Selenium	ug/g	98.6	4.14E-03	<8.00	n/a	n/a	n/a	n/a	8.00	n/a	U
S15M000053		A	7440-24-6	Strontium	ug/g	96.8	<1.00E-03	13.6	n/a	n/a	n/a	n/a	2.00	n/a	B
S15M000053		A	7440-62-2	Vanadium	ug/g	96.8	<1.00E-03	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S15M000053		A	7440-66-6	Zinc	ug/g	97.8	<0.0160	3.58E+05	n/a	n/a	n/a	n/a	32.0	n/a	
ICP/MS															
S15M000053		A	13968-55-3	Uranium-233	ug/g	98.0	<5.00E-05	<1.00E-02	n/a	n/a	n/a	n/a	0.0100	n/a	U
S15M000053		A	13966-29-5	Uranium-234	ug/g	n/a	<1.08E-06	<2.16E-04	n/a	n/a	n/a	n/a	2.16E-04	n/a	U
S15M000053		A	15117-96-1	Uranium-235	ug/g	107	<1.08E-06	3.13E-03	n/a	n/a	n/a	n/a	2.16E-04	n/a	
S15M000053		A	U-238	Uranium-238	ug/g	104	<8.36E-06	4.46E-03	n/a	n/a	n/a	n/a	1.67E-03	n/a	
S15M000053		A	13982-10-0	Plutonium-242	ug/g	106	<1.30E-04	<0.0260	n/a	n/a	n/a	n/a	0.0260	n/a	U
S15M000053		A	7440-22-4	Silver	ug/g	98.9	<8.00E-04	1.74	n/a	n/a	n/a	n/a	0.160	n/a	B
S15M000053		A	7440-41-7	Beryllium	ug/g	92.7	<2.00E-04	<0.0400	n/a	n/a	n/a	n/a	0.0400	n/a	U

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N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW7

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
ICP/MS															
S15M000053		A	7439-96-5	Manganese	ug/g	104	<2.60E-03	66.3	n/a	n/a	n/a	n/a	0.520	n/a	
S15M000053		A	7440-28-0	Thallium	ug/g	98.8	1.77E-03	<0.0800	n/a	n/a	n/a	n/a	0.0800	n/a	U

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
DSC Exotherm by TA															
S15M000049			DSC-01	DSC Exotherm	J/g	99.5	n/a	<0.0100	<0.0100	n/a	n/a	n/a	0.0100	n/a	
pH on Solid Samples															
S15M000049			PH	pH	unitless	n/a	n/a	5.67	n/a	n/a	n/a	n/a	5.67	n/a	

Sample Portion: Sb Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
ICP/MS															
S15M000051		A	7440-36-0	Antimony	ug/g	94.1	<6.00E-04	16.4	n/a	n/a	n/a	n/a	0.119	n/a	

Sample Portion: Water Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Anions and Small Organic Acids															
S15M000052		W	338-70-5	Oxalate	ug/g	97.0	<9.00E-03	<509	n/a	n/a	n/a	n/a	509	n/a	UN
S15M000052		W	14797-55-8	Nitrate	ug/g	96.4	0.101	1.06E+05	n/a	n/a	n/a	n/a	1.23E+03	n/a	
Mercury by CVAA															
S15M000054		HG	7439-97-6	Mercury	ug/g	106	<1.10E-05	0.0597	n/a	n/a	n/a	n/a	2.20E-03	n/a	B

Sample Portion: Zr Fusion Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Am241,Cm243 by TRU-Spec Resin															
S15M000050		Z	14596-10-2	Americium-241	uCi/g	109	9.46E-05	0.0340	n/a	n/a	n/a	n/a	1.06E-04	1.54	
S15M000050		Z	14993-75-0T	Americium-243T	%	n/a	92.180	92.810	n/a	n/a	n/a	n/a	n/a	n/a	
Env Sr-89/90 for Solids															
S15M000050		Z	SR-89/90	Strontium-89/90	uCi/g	101	<8.77E-04	<8.97E-04	n/a	n/a	n/a	n/a	8.97E-04	n/a	U

NA = Not Analyzed, ND = Not Detected

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C - Inorganic Blank Contamination

N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

PFP Filter Box FB-14 Residue 2015-03
Data Summary of All Results

Sample Group: 20150454

SDG Number: 20150454

Customer Sample ID: B30BW7

Sample Portion: Zr Fusion Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Env Sr-89/90 for Solids															
S15M000050		Z	7440-24-6C	Strontium-C	%	n/a	81.3	81.1	n/a	n/a	n/a	n/a	n/a	n/a	
Plutonium-241 by LSC															
S15M000050		Z	14119-32-5	Plutonium-241	uCi/g	90.8	<0.0129	0.106	n/a	n/a	n/a	n/a	9.33E-03	12.016	
S15M000050		Z	15411-92-4	Plutonium-236T	%	n/a	70.9	104	n/a	n/a	n/a	n/a	n/a	n/a	
Pu238,239 by TRU-SPEC Resin															
S15M000050		Z	PU-239/240	Plutonium-239/240	uCi/g	99.7	<1.63E-04	0.234	n/a	n/a	n/a	n/a	9.96E-05	0.57	
S15M000050		Z	15411-92-4	Plutonium-236T	%	n/a	63.8	96.2	n/a	n/a	n/a	n/a	n/a	n/a	
S15M000050		Z	13981-16-3	Plutonium-238	uCi/g	n/a	<1.73E-04	4.38E-03	n/a	n/a	n/a	n/a	1.44E-04	4.35	

NA = Not Analyzed, ND = Not Detected

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N - Spike Outside Range

M - Inorganic RPD Outside Range

B - Inorganic Estimated

Attachment 2

ANALYSIS DATE AND HOLDING TIME REPORT

ANALYSIS DATE AND HOLDING TIME REPORT

Sample	Customer Sample ID	Method	Prep Method	Sample Date Time	Received Date	Preparation Date	Analysis Date	Missed Holding Time?
S15M000047	B30BW6	GPC-Gross Alpha/Beta	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/06/2015 09:00	No
S15M000053	B30BW7	GPC-Gross Alpha/Beta	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/06/2015 09:00	No
S15M000038	B30BW6	AEA- Am-241	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/14/2015 08:03	No
S15M000050	B30BW7	AEA- Am-241	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/14/2015 08:03	No
S15M000037	B30BW6	DSC-TA	N/A	03/05/2015 13:50	03/25/2015 09:20	N/A	06/03/2015 13:07	N/A
S15M000049	B30BW7	DSC-TA	N/A	03/05/2015 13:50	03/25/2015 09:20	N/A	06/03/2015 08:49	N/A
S15M000048	B30BW6	HG	Hg Prep	03/05/2015 13:50	03/25/2015 09:20	04/13/2015 08:20	04/13/2015 14:13	Yes
S15M000054	B30BW7	HG	Hg Prep	03/05/2015 13:50	03/25/2015 09:20	04/13/2015 08:20	04/13/2015 14:20	Yes
S15M000046	B30BW6	IC -Anions, SW-846 9056A	Water Digest	03/05/2015 13:50	03/25/2015 09:20	04/07/2015 10:15	04/08/2015 14:13	No
S15M000052	B30BW7	IC -Anions, SW-846 9056A	Water Digest	03/05/2015 13:50	03/25/2015 09:20	04/07/2015 10:15	04/08/2015 16:57	No
S15M000045	B30BW6	ICP/MS Metals , SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/15/2015 08:30	04/28/2015 18:40	No
S15M000051	B30BW7	ICP/MS Metals, SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/15/2015 08:30	04/28/2015 18:49	No
S15M000047	B30BW6	ICP-AES Metals, SW-8466010C	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/21/2015 11:29	No
S15M000047	B30BW6	ICP-AES Metals, SW-8466010C	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/27/2015 10:56	No
S15M000053	B30BW7	ICP-AES Metals, SW-8466010C	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/21/2015 11:35	No
S15M000053	B30BW7	ICP-AES Metals, SW-8466010C	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/27/2015 11:07	No
S15M000047	B30BW6	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 11:58	N/A
S15M000047	B30BW6	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 10:00	N/A
S15M000047	B30BW6	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/04/2015 15:08	N/A
S15M000053	B30BW7	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 12:07	N/A
S15M000053	B30BW7	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 10:08	N/A
S15M000053	B30BW7	MS Actinides	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/04/2015 15:16	N/A
S15M000047	B30BW6	ICP/MS Metals , SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 17:13	N/A
S15M000047	B30BW6	ICP/MS Metals , SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/20/2015 11:17	No
S15M000053	B30BW7	ICP/MS Metals , SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	04/28/2015 17:21	No
S15M000053	B30BW7	ICP/MS Metals , SW-846 6020A	Acid Digest , SW-846 3050B	03/05/2015 13:50	03/25/2015 09:20	04/16/2015 08:45	05/20/2015 11:26	No
S15M000037	B30BW6	PH Solid, SW-846 9045A	N/A	03/05/2015 13:50	03/25/2015 09:20	N/A	04/20/2015 15:00	Yes
S15M000049	B30BW7	PH Solid, SW-846 9045A	N/A	03/05/2015 13:50	03/25/2015 09:20	N/A	04/20/2015 15:00	Yes
S15M000038	B30BW6	AEA- Isotopic Plutonium	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/14/2015 08:00	No
S15M000050	B30BW7	AEA- Isotopic Plutonium	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/14/2015 08:00	No
S15M000038	B30BW6	Pu-241 by LSC	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	05/05/2015 14:20	No
S15M000050	B30BW7	Pu-241 by LSC	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	05/05/2015 14:20	No
S15M000038	B30BW6	GPC - Sr-90	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/20/2015 14:00	No
S15M000050	B30BW7	GPC- Sr-90	Fusion Digest - Separation	03/05/2015 13:50	03/25/2015 09:20	04/06/2015 14:43	04/20/2015 14:00	No

Attachment 3

CORRESPONDENCE

Menjivar, Carolina E

From: Menjivar, Carolina E
Sent: Tuesday, May 26, 2015 9:50 AM
To: Widney, Richard J (Jeff)
Cc: Ritenour, Gerald P; Menjivar, Carolina E
Subject: HEPA Filter Box (FB-14) Samples - Differential Scanning Calorimetric (DSC) Testing

Jeff,
Per your request, the samples B30BW6 and B30BW7, taken from the HEPA Filter Box (FB-14), will be tested for DSC. The turnaround time for these results would be the end of this week (05/29/15).
If you have any questions, please let me know.

Thanks,

Carolina Menjivar
Project Coordinator
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy
509-372-2525
[Carolina E Menjivar@rl.gov](mailto:Carolina_E_Menjivar@rl.gov)

Menjivar, Carolina E

From: Widney, Richard J (Jeff)
Sent: Wednesday, April 01, 2015 2:26 PM
To: Menjivar, Carolina E
Cc: Ritenour, Gerald P; Southerland, D T (Todd); Garrison, Scott M; Hopkins, Ted A; Brack, James R
Subject: RE: 222-S Laboratory Outage Impacts - Update

Extension approved.

Jeff Widney
Waste Operations and NDA Director
PFP Closure Project
Office (509) 372-3090
Cell (509) 551-2364

From: Menjivar, Carolina E
Sent: Wednesday, April 01, 2015 9:01 AM
To: Widney, Richard J (Jeff)
Cc: Ritenour, Gerald P
Subject: 222-S Laboratory Outage Impacts - Update

Jeff,
The 222-S Laboratory outage took longer than anticipated; originally, it was planned for 1 week (March 12 through March 23). However, it was extended to almost three weeks. As of today (04/01/15), electricity has been restored in the lab, and there are still certain areas where access is restricted. Entry into the lab will not be allowed until required radiological surveys in all the rooms are complete.

This outage has impacted our ability of analyzing and reporting analytical results as scheduled. Therefore, I am requesting an extension for reporting results for the following projects:

- PFP-South Canyon Airlock Powder- original due date: 04/08/2015. Requesting two week extension, so extended due date would 04/22/15.
- PFP-Filter Box FB-14 Residue – original due date: 05/07/2015. Requesting two week extension, so extended due date would be 05/21/15.

Note: If results are available before the proposed extended dates, the analytical reports will be provided to you sooner.

Please reply to this email to let me know if this is Ok with you.

Thanks,

Carolina Menjivar

Project Coordinator
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy
509-372-2525 (Office)
Carolina_E_Menjivar@rl.gov

Attachment 4

RECEIPT PAPERWORK

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev <u>D G. 0</u>
--------------	---	----------------------------------

Date Samples Received: 3-25-15 Total Number of Samples: 2 Group #: 20150454
 Sample Custodian: RT Steele *rtsteele* IH Technician: NA

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSR provided?	✓			
Verify GKI is complete			✓	<input checked="" type="checkbox"/> In Project File
Received from an alpha facility?	✓			<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate			✓	<input checked="" type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) noted on the COC RSA and sample bottles			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA		*		<i>will verify sample #s upon Breakdown</i>
Samples stored properly (e.g., refrigeration)	✓			<i>HPT (SG RMA) 4TUV</i>

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? no PC Initials RKI Date 3-25-15

If No, comment on communication and resolution:

on Hold — waiting for P.C. Release.
rtsteele

Number of IH Samples Received:

Aldehyde Screen: _____	Amines: _____	Ammonia: <u>NA</u>	Aromatic HC: _____	Asbestos: _____
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe _____	1,3-Butadiene: _____
Formaldehyde: _____	Furans: _____	Mercury: _____	Methanol: _____	Nitrosamines: _____
Nitrous Oxide: _____	Pyridines: _____	SVOA: _____	VOA: _____	Other-IH: _____

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F13-006-001

PAGE 1 OF 2

COLLECTOR K. Patterson /CHPRC	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9M	DATA TURNAROUND
SAMPLING LOCATION PFP HEPA Filter Box FB-14 - 01	PROJECT DESIGNATION HEPA Filter Box (FB-14) , 234-5Z, Rm 308 - Other Solid Sampling		SAF NO. F13-006	AIR QUALITY <input type="checkbox"/>	30 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507 3/p33	ACTUAL SAMPLE DEPTH N/A	COA 303531	METHOD OF SHIPMENT GOVERNMENT VEHICLE ORIGINAL	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool <=6C	
		HOLDING TIME	28 Days	
		TYPE OF CONTAINER	aG/P	
		NO. OF CONTAINER(S)	1	
		VOLUME	30g	
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30BW6	OTHER SOLID	3/5/15	1350	✓

will verify sample #s upon break down
Rtkul
3-25-15

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM K. Patterson /CHPRC	DATE/TIME 3/5/15 1530	RECEIVED BY/STORED IN K. Wilson /C... DATE/TIME 3/5/15 1530
RELINQUISHED BY/REMOVED FROM K. Wilson /C...	DATE/TIME 3/5/15 1530	RECEIVED BY/STORED IN 192A DATE/TIME 3/5/15 1530
RELINQUISHED BY/REMOVED FROM 192A	DATE/TIME 3/25/15 7:30 AM	RECEIVED BY/STORED IN M... DATE/TIME 3/25/15 8:20 AM
RELINQUISHED BY/REMOVED FROM M...	DATE/TIME 3-25-15 836	RECEIVED BY/STORED IN Dougherty, Dougherty DATE/TIME 3-25-15
RELINQUISHED BY/REMOVED FROM Dougherty, Dougherty	DATE/TIME 3-25-15 0920	RECEIVED BY/STORED IN Rtkul, Rtkul ATC DATE/TIME 3-25-15 0920
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN DATE/TIME

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

TRVL-15-010

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F13-006-001	PAGE 2 OF 2
COLLECTOR K. Patterson/CHPRE	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9M	DATA TURNAROUND 30 Days / 45 Days
SAMPLING LOCATION PFP HEPA Filter Box FB-14 - 01	PROJECT DESIGNATION HEPA Filter Box (FB-14) , 234-5Z, Rm 308 - Other Solid Sampling		SAF NO. F13-006	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNFN-50731p33	ACTUAL SAMPLE DEPTH N/A	COA 303531	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

SPECIAL INSTRUCTIONS

(1) 7471_MERCURY_CV: COMMON (SOLIDS); 6020_METALS_ICPMS: COMMON {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Selenium, Silver}; 6020_METALS_ICPMS: COMMON (Add-on) {Manganese, Nickel, Thallium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON {Antimony, Barium, Cadmium, Calcium, Chromium, Cobalt, Copper, Magnesium, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON (Add-on) {Aluminum, Arsenic, Beryllium, Lead, Selenium, Strontium, Thallium}; 9056_ANIONS_IC: COMMON {Nitrate}; 9056_ANIONS_IC: COMMON (Add-on) {Oxalate}; 9045_pH (Non-Aqueous): COMMON; Actinides ICPMS: COMMON {Plutonium-242, Uranium-233, Uranium-234, Uranium-235, Uranium-238}; ALPHA_GPC: COMMON; BETA_GPC: COMMON; AMCMISO_EIE_PRECIP_AEA: COMMON; PUISO_IE_PRECIP_AEA: COMMON {Plutonium-238, Plutonium-239/240}; PU241_IE_LSC: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON;

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CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F13-006-002

PAGE 1 OF 2

COLLECTOR K. Patterson / CHPRC	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9M	DATA TURNAROUND 30 Days / 45 Days
SAMPLING LOCATION PFP HEPA Filter Box FB-14 - 02	PROJECT DESIGNATION HEPA Filter Box (FB-14) , 234-5Z, Rm 308 - Other Solid Sampling		SAF NO. F13-006	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507 31p33	ACTUAL SAMPLE DEPTH N/A	COA 303531	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool <=6C
		HOLDING TIME	28 Days
		TYPE OF CONTAINER	aG/P
		NO. OF CONTAINER(S)	1
		VOLUME	30g
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B30BW7	OTHER SOLID	3/5/15	1350 ✓

will verify sample #s upon breakdown
 RTH
 3-25-15

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
K. Patterson CHPRC	3/5/15 1524	Kowilson / Leon
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
Kowilson / Leon	3/5/15 1530	192A
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
192A	3/25/15 830	192A Michael G. ...
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
Michael G. ...	3-25-15 8:30	Michael G. ...
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
		RTH RTH at 3-25-15 0920
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

TEV-15-010

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

01/25/2017

20150454 Rev. 1

REV.1

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F13-006-002

PAGE 2 OF 2

COLLECTOR K. Patterson / CHPRC	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9M	DATA TURNAROUND 30 Days / 45 Days
SAMPLING LOCATION PFP HEPA Filter Box FB-14 - 02	PROJECT DESIGNATION HEPA Filter Box (FB-14) , 234-5Z, Rm 308 - Other Solid Sampling		SAF NO. F13-006	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNFN-5073/p33	ACTUAL SAMPLE DEPTH N/A	COA 303531	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

SPECIAL INSTRUCTIONS

(1) 7471_MERCURY_CV: COMMON (SOLIDS); 6020_METALS_ICPMS: COMMON {Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Selenium, Silver}; 6020_METALS_ICPMS: COMMON (Add-on) {Manganese, Nickel, Thallium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON {Antimony, Barium, Cadmium, Calcium, Chromium, Cobalt, Copper, Magnesium, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON (Add-on) {Aluminum, Arsenic, Beryllium, Lead, Selenium, Strontium, Thallium}; 9056_ANIONS_IC: COMMON {Nitrate}; 9056_ANIONS_IC: COMMON (Add-on) {Oxalate}; 9045_pH (Non-Aqueous): COMMON; Actinides ICPMS: COMMON {Plutonium-242, Uranium-233, Uranium-234, Uranium-235, Uranium-238}; ALPHA_GPC: COMMON; BETA_GPC: COMMON; AMCMISO_EIE_PRECIP_AEA: COMMON; PUIISO_IE_PRECIP_AEA: COMMON {Plutonium-238, Plutonium-239/240}; PU241_IE_LSC: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON;

TRVL-15-010

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F13-006-001/002 CACN/COA _____ Customer Identification Number PPF

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
White crystalline material from Filter Box 14

MSDS Available? No Yes Hanford MSDS No. _____

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?

By checking "unknown" the customer understands that no knowledge is available following a careful search.

List Federal Waste Code(s): _____

List Constituent(s): _____

- P Codes: _____ Yes No
- U Codes: _____ Yes No
- K Codes: _____ Yes No Unknown
- F Codes: _____ Yes No Unknown

b) List applicable characteristic waste codes, flash point, pH, constituents, and concentrations as appropriate.

- D001: FP <100°F FP ≥100 <140°F DOT Oxidizer Yes No Unknown
- D002: pH ≤2 pH ≥12.5 Solid Corrosive (WSC2) Yes No Unknown
- D003: Cyanide Sulfide Water Reactive Other _____ Yes No Unknown
- D004-D043 (Identify applicable waste codes and concentrations): _____ (i.e., peroxide former, explosive, air reactive) Yes No Unknown

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

(*State mixture rule for ignitability)

- | | |
|---|--|
| WT01: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown | WP01: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown |
| WT02: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown | WP02: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown |
| W001: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown | WP03: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown |
| List constituents and concentrations: | F003:* <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown |

4. Is this material TSCA regulated for PCBs? Yes No Unknown Analysis Requested

List concentration if applicable: _____

If yes, what is the source of the PCBs? (see TSCA PCB Hanford Site User Guide, DOE/RL-2001-50)

- PCB Liquid Waste PCB Bulk Product Waste PCB Transformer ≥500 ppm Unknown
- PCB Remediation Waste PCB R&D Waste PCB contaminated electrical equipment (capacitor/ballast) <500 ppm
- PCB Spill Material PCB Item Other PCB Waste (list) _____

5. Is this material TRU? Yes No Unknown

6. ACCURACY OF INFORMATION

Based on my inquiry of those individuals immediately responsible for obtaining this information, that to the best of my knowledge, the information entered in this document is true, accurate, and complete.

Print & Sign

RJ Widney / RJ Widney

Date

5/20/15