FINAL REPORT FOR THE ARRA SAMPLING OF GLOVEBOX 400 IN ROOM 235D BUILDING 234-5Z AT THE PLUTONIUM FINISHING PLANT, APRIL 2010 SAMPLE DELIVERY GROUP 222S20100370

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222-S LABORATORY

FINAL REPORT FOR THE ARRA SAMPLING OF GLOVEBOX 400 IN ROOM 235D, BUILDING 234-5Z AT THE PLUTONIUM FINISHING PLANT, APRIL 2010 SAMPLE DELIVERY GROUP 222S20100370

1.0 INTRODUCTION

This report presents the results for the pipe deposit samples received on April 27, 2010, from the sampling of Glovebox 400 in room 235D, building 234-5Z at the Plutonium Finishing Plant (PFP). The samples were analyzed in accordance with PFP-LOI-10-0007, *Letter of Instruction for Analysis of GB400, Deposits in Pipe, Room 235D, Building 234-5Z* (LOI); DOE/RL-2004-29, *Sampling and Analysis Plan for the Plutonium Finishing Plant, Above-Grade Structures* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods;* and the additional guidance given by the customer point of contact (POC).

Due to the hazardous and complex nature of Hanford 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	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Correspondence
Attachment 5	Receipt Paperwork

2.0 SAMPLE RECEIPT, HANDLING, AND APPEARENCE

Two solid samples, B250Y9 and B25100, were collected on April 13, 2010, and received at the 222-S Laboratory on April 27, 2010, in good condition and with adequate paperwork. The chain of custody indicated preservation of cooling to ~4 °C. There was no evidence of cooling of the samples during delivery, as indicated on the sample receipt checklist included in Attachment 5. The customer POC was notified of this discrepancy (see correspondence in Attachment 4). The samples were placed in a refrigerator upon receipt.

3.0 HOLDING TIMES

Attachment 3 presents the Holding Time Report for all methods with applicable holding times based on SW-846. As indicated in this attachment, all holding times were met.

4.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the Sampling Authorization Form (SAF) and LOI. The laboratory met the requested detection limits for metals using the inductively coupled plasma-atomic emission spectroscopy (ICP) method. Therefore, as indicated in the LOI, the inductively coupled plasma-mass spectrometry (ICP-MS) method was not required.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses or the minimum detectable activity 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 prepared by an acid digest that follows SW-846 Method 3050B.
- "E" indicates samples prepared by a strong acid digest.
- "W" indicates samples prepared by a water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation analysis or with sample preparation performed as a part of the analytical procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

- "B" indicates that the reported inorganic analyte result or radionuclide result measured by ICP-MS should be considered an estimate because the sample concentration is greater than the MDL but less than the quantitation limit.
- "J" indicates that the reported radionuclide result measured using a radiochemistry method should be considered an estimate because the counting uncertainty is greater than 30%.
- "M" indicates that the relative percent difference (RPD) between sample and duplicate results for inorganic analytes is outside of range listed in the SAP.
- "N" indicates that the matrix spike (MS) is outside of range listed in the SAP.
- "U" indicates that the reported result is less than the calculated detection limit.
- "X" is a user-defined flag. For this report, the "X" flag is applied to metals results where the analyte was detected in the interference check standard at a level that was greater than 5% of the sample result. This is further discussed in section 4.1.4.

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

4.1 INORGANIC ANALYSES

4.1.1 pH Analysis

The pH of the samples was determined on direct aliquots. The pH laboratory control sample (LCS) measurement and RPD met the acceptance criteria in ATL-MP-1011.

4.1.2 Mercury

The Hg analysis was performed on acid-digested aliquots. The LCS recovery, MS recovery, and RPD met the criteria in the SAP. No Hg was detected in the method blank. The reported MDL met the required detection limit (RDL) in the SAP.

4.1.3 Ion Chromatography

Ion chromatography analysis was performed on water-digested aliquots. The LCS recoveries and MS recoveries met the requirements in the SAP. The RPD for nitrite for sample B250Y9 exceeded the SAP requirement of ±30%, at 31.1%. This was discussed with the customer POC, and the laboratory was instructed to report the results with a qualifier flag (see communication in Attachment 4). An "M" flag was applied to the nitrite result for sample B250Y9. All other RPDs were within the requested limits. A low level of nitrite was detected in the preparation blank associated with each sample analysis. Since the level in the blank was below the quantitation limit and less than 5% of the sample results, no reanalysis was required and no qualifier flag was necessary. No other requested analytes were detected in the preparation blanks. There were not RDLs listed in the SAP for anions in solids.

4.1.4 Inductively Coupled Plasma-Atomic Emission Spectroscopy

The ICP/AES analysis was performed on acid-digested aliquots. All LCS recoveries and RPDs met the requirements in the SAP. No requested analytes were detected in the blanks. The analytes with RDLs listed in the SAP met the requirement. Therefore, no metals were reported from ICP-MS (see communication in Attachment 4).

The MS recoveries for aluminum, barium, chromium, sodium, nickel, lead, and zinc were outside of the limits listed in the SAP. For aluminum, chromium, sodium, nickel, and zinc, the concentration of analyte in the sample was greater than four times the spike concentration. Therefore, the spike recovery criteria were not applicable and no flag was applied. An "N" flag was applied to the barium and lead results for both samples to indicate the spike failure. It is the laboratory's opinion that the failure of the matrix spike for these two analytes was due the high concentration of sulfate in the samples causing precipitation of barium sulfate and lead sulfate during the digestion. This would indicate that the sample results are likely to be biased low. This spike failure was communicated to the customer POC (see Attachment 4). Since the sulfate precipitation was unavoidable, the customer verbally agreed that a redigestion and reanalysis was not necessary.

Note that low levels of arsenic, cadmium, cobalt, manganese, and selenium were detected in two of the interference check standards. This is an indication of potential high bias in the results. It is the laboratory's opinion that the level of cadmium, manganese, and selenium detected in the interference standard was insignificant. However, for arsenic and cobalt, the level detected in the interference check standard was greater than 5% of the sample results and an "X" flag was applied. The customer POC indicated that no reanalysis was necessary based on this failure (see communication in Attachment 4).

4.1.5 Inductively Coupled Plasma-Mass Spectrometry

The ICP-MS analysis was performed on acid-digested aliquots. The requested analytes were ^{237}Np, ^{242}Pu, ^{233}U, ^{234}U, ^{235}U, and ^{238}U. An acid digestion using concentrated hydrochloric and nitric acids was used to get the uranium oxide into solution more effectively. An LCS and MS were not prepared during the acid digestion. These quality control samples were prepared at the time of the instrument analysis. The LCS and MS standards consisted of ^{237}Np, ^{239}Pu, ^{235}U, and ^{238}U. Since ^{239}Pu was not a requested analyte, it is not included in the data summary report.

The LCS recoveries and spike recoveries met the criteria in the SAP. The RPDs all met the requirements in the SAP. A low level of ^{238}U was detected in the preparation blank. Since the concentration was below the quantitation limit and less than 5% of the sample results, no reanalysis or flagging was required. No other required analytes were detected in the preparation blank.

Direct calibration, where a standard containing the isotope and element of interest is used to calibrate the response of the isotope, is the most accurate type of calibration; however, standard material is not available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative." The 222-S Laboratory currently does not have standards available for calibration, calibration checks, or matrix spikes for ^{242}Pu, ^{233}U, or ^{234}U. The results for these isotopes are all considered semi-quantitative.

4.2 RADIOCHEMICAL ANALYSIS

4.2.1 Total Alpha/Total Beta

The total alpha/total beta analysis was performed on acid-digested aliquots using the strong acid digest. The LCS recoveries, spike recoveries, and RPDs met the criteria in the SAP. The LCS and spike were prepared after the digestion. No alpha or beta activity was detected in the preparation blank. The reported minimum detectable activity (MDA) met the RDL requirement in the SAP.

4.2.2 Gamma Energy Analysis

The GEA was performed on acid-digested aliquots using the strong acid digest. The LCS recoveries met the criteria in the SAP. No isotopes were detected in the preparation blank. There was no RDL requirement listed for ^{228}Th. The reported MDAs met the RDL requirement in the SAP.

4.2.3 Strontium-90

The ^{90}Sr analysis was performed on acid-digested aliquots using the strong acid digest. The LCS recovery met the criteria in the SAP. No ^{90}Sr activity was detected in the sample selected for the duplicate analysis; therefore, an RPD calculation is not applicable. No ^{90}Sr activity was detected in the preparation blank. The reported MDA met the RDL requirement in the SAP.

4.2.4 Americium-241

The ^{241}Am analysis was performed on acid-digested aliquots using the strong acid digest. The LCS recovery and RPD met the criteria in the SAP. No ^{241}Am activity was detected in the preparation blank. The reported MDA did not meet the RDL requirement in the SAP because a small sample size was required based on the americium activity in the samples.

4.2.5 Plutonium-238 and Plutonium-239/240

The ^{238}Pu and $^{239/240}Pu$ analysis was performed on acid-digested aliquots using the strong acid digest. The LCS recovery and RPD met the criteria in the SAP. No ^{238}Pu or $^{239/240}Pu$ activity was detected in the preparation blank. The reported MDA did not meet the RDL requirement in

the SAP because a small sample size was required based on the high plutonium activity in the samples.

5.0 PROCEDURES

Table 1 lists the analytical procedures used for analysis of the PFP 235D Glovebox 400.

Table 1. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
pH (9045C)	LA-212-105, Rev. G-0	LA-212-105, Rev. G-0
Mercury – Cold Vapor Atomic Absorption (7471A)	LA-325-110, Rev. A-0	LA-325-110, Rev. A-0
IC (9056A)	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
ICP/AES (3050B/6010C)	LA-505-163, Rev. G-0	LA-505-161, Rev. J-0-A
ICP/MS: actinides	LA-544-101, Rev. F-0	LA-506-102, Rev. F-0
Radiochemical Analyses		
Total Alpha/Total Beta	LA-544-101, Rev. F-0	LA-508-101, Rev. L-2
GEA	LA-544-101, Rev. F-0	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting	LA-544-101, Rev. F-0	LA-220-101, Rev. I-0
^{241}Am – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240}Pu$, ^{238}Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1

6.0 REFERENCES

ATL-MP-1011, 2009, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 9, Advanced Technologies and Laboratories International, Inc., 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.

Memorandum, from R. L. Cathel, CHPRC, to R. A. Bushaw, ATL, *Letter of Instruction for Analysis of GB400, Depoistes in Pipe, Room 235D, Building 234-5Z*, PFP-LOI-10-0007, dated April 21, 2010.

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

Data Summary Report

Sample Group: 20100370

Customer Group or SDG Number: 222S20100370

Customer Sample ID: B250Y9

Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000276	A	7440-22-4	Silver	ug/g	80.5	<5.00E-03	5.48	4.96	5.22	9.94	79.3	0.970	n/a	B
S10M000276	A	7429-90-5	Aluminum	ug/g	87.4	<0.0300	3.14E+04	3.09E+04	3.12E+04	1.59	-817	5.82	n/a	
S10M000276	A	7440-38-2	Arsenic	ug/g	91.8	<0.0500	23.5	20.0	21.8	16.0	84.5	9.70	n/a	BX
S10M000276	A	7440-39-3	Barium	ug/g	92.4	<3.00E-03	52.3	51.3	51.8	1.98	0.995	0.582	n/a	N
S10M000276	A	7440-41-7	Beryllium	ug/g	98.7	<1.00E-03	<0.194	<0.189	n/a	n/a	90.8	0.194	n/a	U
S10M000276	A	7440-43-9	Cadmium	ug/g	88.2	<5.00E-03	86.1	83.1	84.6	3.54	77.2	0.970	n/a	
S10M000276	A	7440-48-4	Cobalt	ug/g	87.8	<0.0100	24.5	26.2	25.4	6.63	83.7	1.94	n/a	X
S10M000276	A	7440-47-3	Chromium	ug/g	88.6	<5.00E-03	3.51E+03	3.40E+03	3.45E+03	3.05	-122	0.970	n/a	
S10M000276	A	7440-50-8	Copper	ug/g	92.6	<5.00E-03	296	292	294	1.46	113	0.970	n/a	
S10M000276	A	7440-09-7	Potassium	ug/g	80.0	<0.500	186	242	214	26.4	88.6	97.0	n/a	B
S10M000276	A	7439-96-5	Manganese	ug/g	87.7	<3.00E-03	149	144	146	3.06	74.7	0.582	n/a	
S10M000276	A	7440-23-5	Sodium	ug/g	84.5	<0.100	1.85E+03	1.95E+03	1.90E+03	5.33	16.0	19.4	n/a	
S10M000276	A	7440-02-0	Nickel	ug/g	86.5	<0.0200	1.52E+03	1.48E+03	1.50E+03	2.58	57.0	3.88	n/a	
S10M000276	A	7439-92-1	Lead	ug/g	86.8	<0.0500	458	439	448	4.02	6.06	9.70	n/a	N
S10M000276	A	7440-36-0	Antimony	ug/g	90.0	<0.0500	45.3	39.1	42.2	14.8	77.6	9.70	n/a	B
S10M000276	A	7782-49-2	Selenium	ug/g	94.0	<0.100	<19.4	<18.9	n/a	n/a	114	19.4	n/a	U
S10M000276	A	7440-24-6	Strontium	ug/g	93.1	<3.00E-03	14.8	14.5	14.6	1.90	76.3	0.582	n/a	
S10M000276	A	7440-28-0	Thallium	ug/g	90.9	<0.100	<19.4	<18.9	n/a	n/a	75.0	19.4	n/a	U
S10M000276	A	7440-62-2	Vanadium	ug/g	91.5	<5.00E-03	25.1	24.0	24.6	4.33	85.0	0.970	n/a	
S10M000276	A	7440-66-6	Zinc	ug/g	88.4	<5.00E-03	4.55E+03	4.42E+03	4.49E+03	2.98	47.0	0.970	n/a	

Sample Portion: Env Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000278	E	12587-46-1	Gross alpha	uCi/g	109	<1.66E-06	2.55	2.67	2.61	4.53	105	1.70E-04	0.65	
S10M000278	E	12587-47-2	Gross beta	uCi/g	108	<6.84E-06	0.240	0.256	0.248	6.54	111	4.32E-04	1.6	
S10M000278	E	14596-10-2	Americium-241	uCi/g	102	<0.159	0.857	0.883	0.870	2.92	n/a	0.198	5.61	
S10M000278	E	10198-40-0	Cobalt-60	uCi/g	99.6	<2.61E-05	<2.82E-05	<2.37E-05	n/a	n/a	n/a	2.82E-05	n/a	U
S10M000278	E	10045-97-3	Cesium-137	uCi/g	106	<3.21E-05	<3.27E-05	<3.14E-05	n/a	n/a	n/a	3.27E-05	n/a	U
S10M000278	E	13968-55-3	Uranium-233	ug/g	n/a	<2.51E-04	<2.51E-04	<2.48E-04	n/a	n/a	n/a	2.51E-04	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
X - Comment
J - Estimated
B - Estimated
M - RPD Outside Range

Data Summary Report

Sample Group: 20100370

Customer Group or SDG Number: 222S20100370

Customer Sample ID: B250Y9

Sample Portion: Env Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000278		E	13966-29-5	Uranium-234	ug/g	n/a	<1.25E-04	3.57E-03	3.64E-03	3.60E-03	2.03	n/a	1.25E-04	n/a	
S10M000278		E	15117-96-1	Uranium-235	ug/g	102	<2.76E-04	0.0261	0.0280	0.0271	7.13	99.3	2.76E-04	n/a	
S10M000278		E	13994-20-2	Neptunium-237	ug/g	100	<1.33E-03	0.0131	0.0146	0.0138	11.1	98.9	1.33E-03	n/a	B
S10M000278		E	U-238	Uranium-238	ug/g	98.1	0.0223	0.796	0.841	0.818	5.60	97.8	0.0138	n/a	
S10M000278		E	13982-10-0	Plutonium-242	ug/g	n/a	<1.00E-04	0.0175	0.0192	0.0183	9.14	n/a	1.00E-04	n/a	
S10M000278		E	PU-239/240	Plutonium-239/240	uCi/g	98.1	<0.104	1.44	1.57	1.50	8.38	n/a	0.163	5.34	
S10M000278		E	13981-16-3	Plutonium-238	uCi/g	n/a	<0.104	0.170	0.183	0.176	7.56	n/a	0.163	12.93	
S10M000278		E	SR-89/90	Strontium-89/90	uCi/g	94.0	<1.30E-04	<1.12E-04	<1.23E-04	n/a	n/a	n/a	1.12E-04	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
S10M000274			7439-97-6	Mercury	ug/g	99.3	<1.00E-04	0.555	0.413	0.484	29.3	92.8	0.0436	n/a	
S10M000274			PH	pH	unitless	n/a	n/a	1.07	1.05	1.06	1.89	n/a	0.0100	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
S10M000286		W	16984-48-8	Fluoride	ug/g	98.0	<1.61E-03	<4.07	6.66	n/a	n/a	100	4.07	n/a	U
S10M000286		W	16887-00-6	Chloride	ug/g	98.4	<9.98E-03	<25.2	63.6	n/a	n/a	103	25.2	n/a	U
S10M000286		W	14797-65-0	Nitrite	ug/g	96.1	0.0455	3.87E+03	2.83E+03	3.35E+03	31.1	82.4	48.6	n/a	M
S10M000286		W	14808-79-8	Sulfate	ug/g	99.3	<0.0187	5.90E+05	5.65E+05	5.78E+05	4.33	99.8	1.97E+03	n/a	
S10M000286		W	338-70-5	Oxalate	ug/g	98.1	<0.0231	<58.4	<56.8	n/a	n/a	74.5	58.4	n/a	U
S10M000286		W	14797-55-8	Nitrate	ug/g	98.7	<0.0208	4.56E+03	4.32E+03	4.44E+03	5.33	118	52.6	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
X - Comment
J - Estimated
B - Estimated
M - RPD Outside Range

Data Summary Report

Sample Group: 20100370

Customer Group or SDG Number: 222S20100370

Customer Sample ID: B25100

Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000277	A	7440-22-4	Silver	ug/g	80.5	<5.00E-03	5.28	n/a	n/a	n/a	n/a	0.940	n/a	B
S10M000277	A	7429-90-5	Aluminum	ug/g	87.4	<0.0300	2.83E+04	n/a	n/a	n/a	n/a	5.64	n/a	
S10M000277	A	7440-38-2	Arsenic	ug/g	91.8	<0.0500	20.9	n/a	n/a	n/a	n/a	9.40	n/a	BX
S10M000277	A	7440-39-3	Barium	ug/g	92.4	<3.00E-03	48.2	n/a	n/a	n/a	n/a	0.564	n/a	N
S10M000277	A	7440-41-7	Beryllium	ug/g	98.7	<1.00E-03	<0.188	n/a	n/a	n/a	n/a	0.188	n/a	U
S10M000277	A	7440-43-9	Cadmium	ug/g	88.2	<5.00E-03	90.0	n/a	n/a	n/a	n/a	0.940	n/a	
S10M000277	A	7440-48-4	Cobalt	ug/g	87.8	<0.0100	25.3	n/a	n/a	n/a	n/a	1.88	n/a	X
S10M000277	A	7440-47-3	Chromium	ug/g	88.6	<5.00E-03	3.04E+03	n/a	n/a	n/a	n/a	0.940	n/a	
S10M000277	A	7440-50-8	Copper	ug/g	92.6	<5.00E-03	308	n/a	n/a	n/a	n/a	0.940	n/a	
S10M000277	A	7440-09-7	Potassium	ug/g	80.0	<0.500	243	n/a	n/a	n/a	n/a	94.0	n/a	B
S10M000277	A	7439-96-5	Manganese	ug/g	87.7	<3.00E-03	164	n/a	n/a	n/a	n/a	0.564	n/a	
S10M000277	A	7440-23-5	Sodium	ug/g	84.5	<0.100	2.39E+03	n/a	n/a	n/a	n/a	18.8	n/a	
S10M000277	A	7440-02-0	Nickel	ug/g	86.5	<0.0200	1.59E+03	n/a	n/a	n/a	n/a	3.76	n/a	
S10M000277	A	7439-92-1	Lead	ug/g	86.8	<0.0500	486	n/a	n/a	n/a	n/a	9.40	n/a	N
S10M000277	A	7440-36-0	Antimony	ug/g	90.0	<0.0500	48.6	n/a	n/a	n/a	n/a	9.40	n/a	B
S10M000277	A	7782-49-2	Selenium	ug/g	94.0	<0.100	<18.8	n/a	n/a	n/a	n/a	18.8	n/a	U
S10M000277	A	7440-24-6	Strontium	ug/g	93.1	<3.00E-03	14.2	n/a	n/a	n/a	n/a	0.564	n/a	
S10M000277	A	7440-28-0	Thallium	ug/g	90.9	<0.100	<18.8	n/a	n/a	n/a	n/a	18.8	n/a	U
S10M000277	A	7440-62-2	Vanadium	ug/g	91.5	<5.00E-03	29.2	n/a	n/a	n/a	n/a	0.940	n/a	
S10M000277	A	7440-66-6	Zinc	ug/g	88.4	<5.00E-03	4.71E+03	n/a	n/a	n/a	n/a	0.940	n/a	

Sample Portion: Env Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000279	E	12587-46-1	Gross alpha	uCi/g	109	<1.66E-06	3.48	n/a	n/a	n/a	n/a	1.24E-04	0.48	
S10M000279	E	12587-47-2	Gross beta	uCi/g	108	<6.84E-06	0.318	n/a	n/a	n/a	n/a	3.15E-04	1.19	
S10M000279	E	14596-10-2	Americium-241	uCi/g	102	<0.159	1.24	n/a	n/a	n/a	n/a	0.195	4.57	
S10M000279	E	10198-40-0	Cobalt-60	uCi/g	99.6	<2.61E-05	<1.79E-05	n/a	n/a	n/a	n/a	1.79E-05	n/a	U
S10M000279	E	10045-97-3	Cesium-137	uCi/g	106	<3.21E-05	<2.27E-05	n/a	n/a	n/a	n/a	2.27E-05	n/a	U
S10M000279	E	13968-55-3	Uranium-233	ug/g	n/a	<2.51E-04	1.87E-04	n/a	n/a	n/a	n/a	1.83E-04	n/a	B

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
X - Comment
J - Estimated
B - Estimated
M - RPD Outside Range

Data Summary Report

Sample Group: 20100370

Customer Group or SDG Number: 222S20100370

Customer Sample ID: B25100

Sample Portion: Env Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000279	E	13966-29-5	Uranium-234	ug/g	n/a	<1.25E-04	4.20E-03	n/a	n/a	n/a	n/a	9.13E-05	n/a	
S10M000279	E	15117-96-1	Uranium-235	ug/g	102	<2.76E-04	0.0309	n/a	n/a	n/a	n/a	2.01E-04	n/a	
S10M000279	E	13994-20-2	Neptunium-237	ug/g	100	<1.33E-03	0.0183	n/a	n/a	n/a	n/a	9.68E-04	n/a	
S10M000279	E	U-238	Uranium-238	ug/g	98.1	0.0223	0.834	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000279	E	13982-10-0	Plutonium-242	ug/g	n/a	<1.00E-04	0.0240	n/a	n/a	n/a	n/a	7.31E-05	n/a	
S10M000279	E	PU-239/240	Plutonium-239/240	uCi/g	98.1	<0.104	2.01	n/a	n/a	n/a	n/a	0.172	4.52	
S10M000279	E	13981-16-3	Plutonium-238	uCi/g	n/a	<0.104	0.250	n/a	n/a	n/a	n/a	0.172	9.48	
S10M000279	E	SR-89/90	Strontium-89/90	uCi/g	94.0	<1.30E-04	3.49E-05	n/a	n/a	n/a	n/a	2.70E-05	122.095	J

Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000275		7439-97-6	Mercury	ug/g	99.3	<1.00E-04	0.544	n/a	n/a	n/a	n/a	0.0401	n/a	
S10M000275		PH	pH	unitless	n/a	n/a	1.03	n/a	n/a	n/a	n/a	0.0100	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
S10M000281	W	16984-48-8	Fluoride	ug/g	101	<1.61E-03	<4.02	<3.91	n/a	n/a	98.3	4.02	n/a	U
S10M000281	W	16887-00-6	Chloride	ug/g	98.3	<9.98E-03	<24.9	<24.3	n/a	n/a	99.4	24.9	n/a	U
S10M000281	W	14797-65-0	Nitrite	ug/g	97.5	0.0387	4.25E+03	3.64E+03	3.94E+03	15.4	71.5	95.0	n/a	
S10M000281	W	14808-79-8	Sulfate	ug/g	101	<0.0187	6.38E+05	6.31E+05	6.35E+05	1.18	99.3	1.94E+03	n/a	
S10M000281	W	338-70-5	Oxalate	ug/g	100	<0.0231	<2.40E+03	<2.34E+03	n/a	n/a	103	2.40E+03	n/a	U
S10M000281	W	14797-55-8	Nitrate	ug/g	97.9	<0.0208	8.75E+03	7.64E+03	8.20E+03	13.5	124	51.9	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
X - Comment
J - Estimated
B - Estimated
M - RPD Outside Range

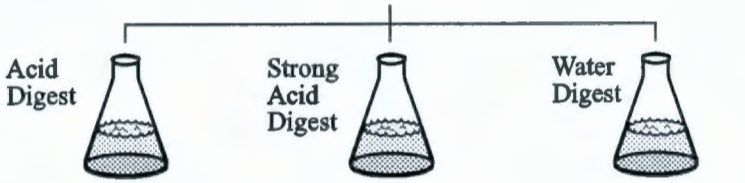
Attachment 2

SAMPLE BREAKDOWN DIAGRAMS

Project: PFP 235D Glovebox 400
SDG: 222S20100370

B250Y9

S10M000274
Hg
pH



S10M000276
ICP Metals

S10M000278
Alpha/Beta
Sr-90
^{241}Am
^{238}Pu, $^{239/240}$Pu
GEA: ^{60}Co, ^{137}Cs
ICP-MS: ^{237}Np, ^{233}U, ^{234}U, ^{235}U, ^{238}U, ^{242}Pu

S10M000286
IC Anions

Project: PFP 235D Glovebox 400
SDG: 222S20100370

B25100

S10M000275
Hg
pH

Acid Digest

S10M000277
ICP Metals

Strong Acid Digest

S10M000279
Alpha/Beta
Sr-90
^{241}Am
^{238}Pu, $^{239/240}Pu$
GEA: ^{60}Co, ^{137}Cs
ICP-MS: ^{237}Np, ^{233}U, ^{234}U, ^{235}U, ^{238}U, ^{242}Pu

Water Digest

S10M000281
IC Anions

Attachment 3

HOLDING TIME REPORT

Holding Time Report for Sample Delivery Group 20100370

Sample Group	Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time?
20100370	S10M000274	SOLID	PH SOLID		04/13/10 14:00	04/27/10 10:00	N/A	05/06/10 14:59	N
20100370	S10M000275	SOLID	PH SOLID		04/13/10 14:10	04/27/10 10:00	N/A	05/06/10 14:59	N
20100370	S10M000281	SOLID	IC - ANIONS	WATER DIGEST	04/13/10 14:10	04/27/10 10:00	05/05/10 14:50	05/06/10 06:09	N
20100370	S10M000281	SOLID	IC - ANIONS	WATER DIGEST	04/13/10 14:10	04/27/10 10:00	05/05/10 14:50	05/06/10 08:17	N
20100370	S10M000281	SOLID	IC - ANIONS	WATER DIGEST	04/13/10 14:10	04/27/10 10:00	05/05/10 14:50	05/06/10 11:28	N
20100370	S10M000274	SOLID	HG	ACID DIGEST	04/13/10 14:00	04/27/10 10:00	N/A	05/06/10 14:41	N
20100370	S10M000275	SOLID	HG	ACID DIGEST	04/13/10 14:10	04/27/10 10:00	N/A	05/06/10 14:41	N
20100370	S10M000286	SOLID	IC - ANIONS	WATER DIGEST	04/13/10 14:00	04/27/10 10:00	05/27/10 10:15	05/27/10 21:00	N
20100370	S10M000286	SOLID	IC - ANIONS	WATER DIGEST	04/13/10 14:00	04/27/10 10:00	05/27/10 10:15	05/27/10 18:52	N
20100370	S10M000276	SOLID	ICP-RCRA METALS	ACID DIGEST	04/13/10 14:00	04/27/10 10:00	05/05/10 16:30	05/20/10 14:08	N
20100370	S10M000277	SOLID	ICP-RCRA METALS	ACID DIGEST	04/13/10 14:10	04/27/10 10:00	05/05/10 16:30	05/20/10 14:56	N

Attachment 4

CORRESPONDENCE

Bushaw, Ruth A

From: Bushaw, Ruth A
Sent: Wednesday, April 28, 2010 9:10 AM
To: Cathel, Robert L
Cc: Widney, Richard J (Jeff)
Subject: PFP 235D Glovebox 400 Sample Receipt

Bob,

I wanted to let you know that the COCs for the PFP 235D Glovebox 400 samples indicated preservation by cooling to ~ 4 °C. However, the samples were not delivered in a cooler, nor was there any ice in the shipping box that they were delivered in. We placed them in the refrigerator upon receipt.

Also to note, we received a copy of the RSR, rather than the original. We usually get the original RSR and send a copy back with the person who delivers the samples.

Thanks,

Ruth A. Bushaw

Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Clinton, Richard (Rich)
Sent: Wednesday, May 26, 2010 10:54 AM
To: Bushaw, Ruth A; Cathel, Robert L
Subject: RE: Detection Limits for PFP Room 235D Glovebox 400

Ruth,

Since the detection limits (with a 4X dilution) are below the regulatory thresholds for those constituents, you do not need to do a run on the ICP-MS. Please document the dilution issue in your narrative.

Thank you,

Rich C.

From: Bushaw, Ruth A
Sent: Monday, May 24, 2010 9:14 AM
To: Cathel, Robert L; Clinton, Richard (Rich)
Subject: Detection Limits for PFP Room 235D Glovebox 400
Importance: High

Bob and Rich,

We ran the ICP analysis for the Room 235D Glovebox 400 samples at a 4X dilution because of very high sulfur in the samples. The document that you supplied for QC requirements (DOE/RL-2004-29) did not include all analytes that were requested. We are able to meet all of the detection limits for the analytes that are listed in that document using the 4X dilution on the ICP, so my plan is to cancel the request for metals analysis by ICP-MS. However, before I do that, I wanted to let you know what detection limits we will be reporting to make sure that these will be acceptable. Note that when the sample was screened with no dilution, no beryllium, selenium, or thallium was detected.

If we need to rerun any analytes by ICP-MS, we will need to put in a request for RCT support ASAP to be able to meet the report schedule. The 45-day due date is 6/10/10.

Analyte	Required Detection Limit (per DOE/RL-2004-29) (µg/g)	222-S Detection Limit (µg/g)
Al		5.82
Sb		9.70
As		9.70
Ba	10.5	0.58
Be	0.65	0.19
Cd	1.05	0.97
Cr	2.60	0.7
Co		1.94
Cu		0.97
Pb	11.75	9.70
Mn		0.58

Ni	5.5	3.88
K		97.01
Se		19.40
Ag	2.75	0.97
Na		19.40
Sr		0.58
Tl		19.40
V		0.97
Zn		0.97

Thanks,

Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Clinton, Richard (Rich)
Sent: Wednesday, May 26, 2010 9:18 AM
To: Bushaw, Ruth A; Cathel, Robert L
Subject: RE: Room 235D Glovebox 400 ICP Analysis Results Question

Ruth,

I don't see the need to re-run the analyses as long as you explain the issue with the interference check standards. The As is below the regulatory threshold even with the biased result. The Co is a constituent that we know is not typical of PFP's waste matrix. The Waste Management Representatives will include it in their waste determination.

Thanks,

Rich C.

From: Bushaw, Ruth A
Sent: Tuesday, May 25, 2010 12:21 PM
To: Cathel, Robert L; Clinton, Richard (Rich)
Subject: Room 235D Glovebox 400 ICP Analysis Results Question
Importance: High

Rich,

I have the results from the ICP for the GB400 samples. One potential issue is that I will have to apply an "X" flag to As and Co results because the interference check standards contained trace levels of these analytes that were more than 5% of the sample result. Trace levels of Cd, Mn and Se were also detected in the interference check standards. However, this level was only 1 – 2 % for Cd and Mn. Selenium is reported as a non-detect in the sample, so it's not an issue. I have included the results below, including the regulatory levels (using the 20x rule), where applicable.

Will these results be acceptable? The As results might be really biased because of high Al and Fe that isn't being sufficiently corrected. But the sample result is well below the regulatory concern level. For Co, there is no regulatory limit or requested detection limit, so is that an issue? The other three I would report as non-issues because the interference is so low, or the sample was < DL.

Or do you want us to try running the As on the ICP-MS?

Analyte	Reported Result (µg/g)	Regulatory Level (µg/g)	Affect of ICSA level
As	21	100	ICSA ~ = sample
Cd	86	20	ICSA ~ 2% sample
Co	24.5	N/A – no requested DL either	ICSA ~ 8% sample
Mn	149	N/A – no requested DL either	ICSA ~ 1% sample
Se	<19	20	No issue, sample <DL

Bushaw, Ruth A

From: Bushaw, Ruth A
Sent: Wednesday, May 26, 2010 9:02 AM
To: Clinton, Richard (Rich); Cathel, Robert L
Subject: PFP 235D Glovebox 400 Project

Importance: High

Rich,

I finished review of ICP metals for the Room 235D Glovebox 400 samples. Two analytes (Ba and Pb) had very low spike recoveries (0.99% and 6%, respectively). The very high sulfate in the samples (~6.5 E+5 µg/g) will cause barium sulfate and lead sulfate to precipitate during the prep. Therefore, we are not going to attempt a redigestion and reanalysis. We will accept these results and explain this in the narrative.

Thanks,

Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Cathel, Robert L
Sent: Monday, June 07, 2010 11:36 AM
To: Bushaw, Ruth A; Clinton, Richard (Rich)
Subject: RE: 235D Glovebox 400 Samples High RPD for Nitrite

Ruth,

Thanks for the information. There is no need to reprep and reanalyze the samples; PFP will be able to use the flagged data.

Thanks,
Bob Cathel

From: Bushaw, Ruth A
Sent: Monday, June 07, 2010 10:43 AM
To: Cathel, Robert L; Clinton, Richard (Rich)
Subject: 235D Glovebox 400 Samples High RPD for Nitrite
Importance: High

Bob or Rich,

We had to reprep and reanalyze anions for one sample for the 235D Glovebox 400 project. The nitrite results are high, well above our quantitation limit, but the RPD is about 31%. We also have duplicate and spike data for the other sample that was reported from the first prep. The RPD for nitrite for that sample was 15%. Will you be able to use the results with the data flagged for the high RPD? If not, we will need to reprep and reanalyze, which will take a few more days.

The actual nitrite results for the samples are below.

B250Y9
Nitrite
Sample = 3.87E+03 µg/g
Dup = 2.83E+03 µg/g

B25100
Nitrite
Sample = 4.25E+03 µg/g
Dup = 3.64E+03 µg/g

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Attachment 5

RECEIPT PAPERWORK

20100370

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-174-001	PAGE 1 OF 2
COLLECTOR ERIC BERTRAND	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL	**PRICE CODE** 9N	**DATA TURNAROUND** 45 Days / 45 Days
SAMPLING LOCATION BLDG 234-5Z; ROOM 235D, GB400, I-001	**PROJECT DESIGNATION** PFP GB400 (Deposits in Pipe), Room 235D, Bldg 234-5Z - Other Solid		**SAF NO.** F10-174	**AIR QUALITY** ☐	
ICE CHEST NO. N/A	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA** 301897ES10	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	
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 may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C
HOLDING TIME	6 Months
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B250Y9	OTHER SOLID	4-13-10	1400

S10M000274

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
ERIC BERTRAND / [signature]	4/13/10 1445	DaSorenson / [signature]	4/13/10 1445
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DaSorenson / [signature]	4/27/10 0900	[signature] Robin Scott	4-27-10 0900
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Robin Scott / [signature]	4-27-10 0921	Mark Steffen MARK STEFFEN	4-27-10 0921
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Mark Steffen MARK STEFFEN	4-27-10 1145	R K Steele	4-27-10 1000
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

222S20100370

ORIGINAL

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			F10-174-001	PAGE 2 OF 2
COLLECTOR	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION BLDG 234-5Z; ROOM 235D, GB400, I-001	PROJECT DESIGNATION PFP GB400 (Deposits in Pipe), Room 235D, Bldg 234-5Z - Other Solid		SAF NO. F10-174		
ICE CHEST NO. N/A	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA 301897ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS → See notes below. Bob Cattl Br 4/20/10

** When the pH is <2 or >11, the laboratory will perform titration for H+ or OH- ions as appropriate.
(1) 6020_METALS_ICPMS (TAL) ~~{Aluminum,~~ Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, ~~Copper,~~ Lead, Manganese, ~~Nickel, Potassium,~~ Selenium, Silver, ~~Sodium, Strontium,~~ Thallium, Vanadium, ~~Zinc};~~ ICP Metals - 6010 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010 (Add-On) {Arsenic, Beryllium, Lead, Selenium, Strontium, Thallium}; Mercury - 7471 - (CV); Actinides ICPMS {Neptunium-237, Plutonium-242, Uranium-233, Uranium-234, Uranium-235, Uranium-238}; IC Anions - 9056 {Chloride, Fluoride, Nitrate, Nitrite, Oxalate, Sulfate}; pH (Soil) - 9045; Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gross Alpha {Gross alpha}; Gross Beta {Gross beta}; Americium-241; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total;

Notes:
- 6020 Metals ICPMS – the following were deleted Aluminum, Copper, Nickel, Potassium, Sodium, Strontium, & Zinc. Bob Cattl Br 4/20/10
- ICP Metals 6010 SHALL also include Aluminum! Bob Cattl Br 4/20/10
- 6020 Metals ICPMS shall be run only if SAP detection limits cannot be met by 6010 ICP analysis. Bob Cattl Br 4/20/10

☐ ORIGINAL

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-174-002	PAGE 1 OF 2
COLLECTOR ERIC BERTRAND	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL	**PRICE CODE** 9N **AIR QUALITY** ☐	**DATA TURNAROUND** 45 Days / 45 Days
SAMPLING LOCATION BLDG 234-5Z; ROOM 235D, GB400, I-001 DUP	**PROJECT DESIGNATION** PFP GB400 (Deposits In Pipe), Room 235D, Bldg 234-5Z - Other Solid		**SAF NO.** F10-174		
ICE CHEST NO. N/A	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA** 301897ES10	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	
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 may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C
HOLDING TIME	6 Months
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B25100	OTHER SOLID	4-13-10	1410	

S10M000275

ORIGINAL

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: ERIC BERTRAND / DATE/TIME: 4/13/10 1445	RECEIVED BY/STORED IN: DNS / DATE/TIME: 4/13/10 1445	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS 222S20100370
RELINQUISHED BY/REMOVED FROM: K Wilson / DATE/TIME: 4/27/10 0900	RECEIVED BY/STORED IN: R.S. Scott Robin Scott / DATE/TIME: 4-27-10 0900	
RELINQUISHED BY/REMOVED FROM: R.S. Scott Robin Scott / DATE/TIME: 4-27-10 0921	RECEIVED BY/STORED IN: Mark Dutt MARK DUTT / DATE/TIME: 4-27-10 0921	
RELINQUISHED BY/REMOVED FROM: Mark Dutt MARK DUTT / DATE/TIME: 4-27-10 1445	RECEIVED BY/STORED IN: R Steele R STEELE / DATE/TIME: 4-27-10 1445	
RELINQUISHED BY/REMOVED FROM: / DATE/TIME:	RECEIVED BY/STORED IN: / DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: / DATE/TIME:	RECEIVED BY/STORED IN: / DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: / DATE/TIME:	RECEIVED BY/STORED IN: / DATE/TIME:	

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

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-174-002	PAGE 2 OF 2
COLLECTOR	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION BLDG 234-5Z; ROOM 235D, GB400, I-001 DUP	PROJECT DESIGNATION PFP GB400 (Deposits in Pipe), Room 235D, Bldg 234-5Z - Other Solid		SAF NO. F10-174		
ICE CHEST NO. N/A	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA 301897ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS See notes below, Bob Cathl Dr 4/20/10

(1) 6020_METALS_ICPMS (TAL) ~~{Aluminum~~, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, ~~Copper~~, Lead, Manganese, ~~Nickel~~, ~~Potassium~~, Selenium, Silver, ~~Sodium~~, ~~Strontium~~, Thallium, Vanadium, ~~Zinc}~~; ICP Metals - 6010 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010 (Add-On) {Arsenic, Beryllium, Lead, Selenium, Strontium, Thallium}; Mercury - 7471 - (CV); Actinides ICPMS {Neptunium-237, Plutonium-242, Uranium-233, Uranium-234, Uranium-235, Uranium-238}; IC Anions - 9056 {Chloride, Fluoride, Nitrate, Nitrite, Oxalate, Sulfate}; pH (Soil) - 9045; Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gross Alpha {Gross alpha}; Gross Beta {Gross beta}; Americium-241; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total;

Notes:

- Per discussion with ATL 222-S Project Manager, Ruth Bushaw, the following metals have been deleted from the 6020 Metals ICPMS list: Aluminum, Copper, Nickel, ~~Potas~~ Dr 4/20/10 Potassium, Sodium, Strontium, & Zinc. Bob Cathl Dr 4/20/10
- ICP Metals 6010 SHALL also include: Aluminum. Bob Cathl Dr 4/20/10
- 6020 Metals ICPMS shall be run only if SAP detection limits cannot be met by 6010 ICP analysis. Bob Cathl Dr 4/20/10

ORIGINAL

RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 1 | 4. Ship Prepaid | 5. Via Site Carrier

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company CH2MHILL PRC
Address PFP
City, State, Zip 200 West Area
Contact Jeff Widney
Phone 372-3090

2. SHIP TO ☒ U.S. DEPT. OF ENERGY C/O
Company ATLII
Address 222-S
City, State, Zip 200 West Area
Attention Gerald Ritenour
Phone 372-2742

6. SHIPMENT AUTHORIZATION NUMBER KJ002

7. EMERGENCY RESPONSE
Telephone 1-509-373-3800
Emergency Response Guide(s) 163

HM 8. Proper Shipping Name: | PRI HAZ | SUB HAZ | UN ID

X | Radioactive Material, Type A package | 7 | UN2915

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Viking	DOT 7A TYPE A	S/N 12	05289 [illegible]	Pu239Pu240Am241	N/A	N/A	2.85E-4 TBq	9 Kg

10. Identify for Normal Form Only
Physical Form Solid
Chemical Form Oxide

11.
☐ Highway Route Controlled Quantity
☒ Exclusive Use Shipment with instructions
☐ Placards Applied
☒ Fissile Excepted, Grams 3.85E-03
☐ UN ID Marking

12. LABELS APPLIED
Radioactive Yellow - II

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: | PRI HAZ | SUB HAZ | UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
☐ Highway Route Controlled Quantity
☐ Exclusive Use Shipment with instructions
☐ Placards Applied
☐ Fissile Excepted, Grams
☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: | PRI HAZ | SUB HAZ | UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
☐ Highway Route Controlled Quantity
☐ Exclusive Use Shipment with instructions
☐ Placards Applied
☐ Fissile Excepted, Grams
☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

14. Shipment DE-Ci: 1.0145E-03

Shipment Totals	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
	N/A	N/A	2.85E-4 TBq	9

15. Surface Dose Rate of Package
☐ <0.005 or _____ mSv/hr
<0.5 or ~~<0.05~~ mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.05 mrem/hr (N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Smears of Outer Container
☐ <4.0 Bq (220 dpm) ß γ /cm²
☐ <0.4 Bq (22 dpm) α /cm²
☐ <Tbl. 2-2 HNF-5173 Limits

TRUCK LOAD OR EXCLUSIVE USE
Surface ☑ <2 mSv/hr (200 mrem/hr)
@ 2 meters ☑ <0.1 mSv/hr (10 mrem/hr)
@ Cab or sleeper ☑ <0.02 mSv/hr (2 mrem/hr) (Using N+ß γ)

Bldg. 234-5Z | Survey No. E100427003 | Date 04-27-10

16. TRANSPORTER
Vehicle Number HO-68B-7165
DRIVER SIGNATURE Mark E Stiffler
PRINT NAME MARK STIFFLER

17. RECEIVER
RECEIVER SIGNATURE RtSteele
PRINT NAME RtSteele
Date 4-27-10 1000

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Certifier's Signature	Print Name	On behalf of DOE-RL	Date	Organization
Scott Weiss	Scott Weiss		4-27-10	CSG

19. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION	CARGO AIRCRAFT	PASSENGER AIRCRAFT	Pkg. Dimensions (cm)
☐ N/A	☐ Cargo Aircraft Only Labels Applied	☐ Ltd Qty ☐ Research/Medical Diagnosis ☐ <3 T.I. ☐ Human Medical Research	

20. OFFSITE AUTHORIZATION

Survey No.	Date Shipped	Routing	ETA

Approved for Shipment Offsite | Date

A-6003-214.1 (REV 2)

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-174-001 & 2 CACN/COA 301897 Customer Identification Number GB400, Rm 235D

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
GB400 (deposits in pipe), Room 235D, Bldg 234-5Z

MSDS Available? (•) No ( ) Yes Hanford MSDS No. N/A

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	( ) Unknown
U Codes:			( ) Yes	(•) No	( ) Unknown
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 _____ (i.e., peroxide former, explosive, air reactive)	( ) Yes	( ) No	(•) Unknown
D004-D043 (Identify applicable waste codes and concentrations):				( ) Yes	( ) No	(•) Unknown

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):

Unknown

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

Unknown

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

WT01:	( ) Yes	(•) No	( ) Unknown		WP01:	( ) Yes	(•) No	( ) Unknown
WT02:	( ) Yes	(•) No	( ) Unknown		WP02:	( ) Yes	(•) No	( ) Unknown
W001:	( ) Yes	(•) No	( ) Unknown		WP03:	( ) Yes	(•) No	( ) Unknown
List constituents and concentrations:					F003:*	( ) Yes	(•) No	( ) Unknown

(*State mixture rule for ignitability)

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 Bob Cathel Bob Cathel Date 4/13/10

A-6002-990 (08/03)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev EE.0

Date Samples Received: 4-27-10 Group #: 20100370

Number of Samples: 2

Sample Custodian: RHtch

Sample Custodian to Complete:

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete	✓		on file
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	☑ Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate 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			
• 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			
Samples stored properly (e.g., refrigeration)	✓		

Notify the PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Yes PM Initials RES Date 4/27/2010

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 0)