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SAF-RC-158
105-B Transfer Pit Sediments & Legacy Wastes
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COMMENTS:

SDG 222S20100314 **SAF-RC-158**

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Waste Site: 105-B

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Narrative for 105B Transfer Pit Analyses at 222-S
SDG Number: 222S20100314

On 3/29/2010 ATL received two samples (J19V31 and J19V32) from the 105-B Transfer Pit Sediments & Legacy Wastes Project. The samples were analyzed for the constituents in the Analytical Work Instructions (AWI) documentation provided by the WRPS Sample Management Office, with two exceptions. Since the samples were quite dry, there was no need to centrifuge the material. Therefore, only a "settled solids" bulk density analysis was performed. The AWI requested Radium-228 by GEA. The ATL laboratory reports Actinium-228, which is in equilibrium with Radium-228 after about 2 - 3 days.

The A# column in the data summary report indicates the aliquot class, or the preparation method used for analysis. These are defined as:

- "A" indicates an acid digestion that follows SW846 Method 3050B.
- "E" indicates the acid digestion used for radiochemistry analyses that uses stronger acid concentrations than SW846 Method 3050B.
- "O" indicates an organic extraction.
- "W" indicates a water leach.

The following data qualifiers have been applied to results for this project:

- "B" indicates that the analyte was detected in the blank and in the sample and the blank concentration is greater than 5% of the reported sample result.
- "D" was used for the PCB analysis to indicate that the samples required a dilution because the concentration exceeded the calibration range on the original analysis.
- "J" indicates that the sample result for non-radiochemistry methods is above the method detection limit (MDL) but below the quantitation limit. For radionuclides measured using radiochemistry techniques, the "J" flag is applied to results with a counting uncertainty is greater than 30%.
- "Q" indicates that the results are qualitative. This is used for the bulk density results because of the difficulty in obtaining an accurate volume reading on a solid sample using the markings on a centrifuge tube.
- "U" indicates results that are reported less than the MDL for non-radiochemistry methods or below the minimum detectable activity (MDA) for radiochemistry techniques.
- "b" indicates that the matrix spike recovery was outside of the customer requested limits.
- "c" indicates that the relative percent difference (RPD) between the sample and duplicate results was outside of the customer defined limits.

The laboratory was unable to meet most of the requested RDLs. However, upon review of the preliminary results, the customer point of contact (POC) accepted the detection limits reported.

High RPDs were reported for lead, ^{234}U, ^{235}U, ^{236}U, ^{238}U, ^{63}Ni, ^{99}Tc, ^{14}C, and Aroclor-1254.

- For ^{99}Tc and ^{14}C, the counting uncertainty was >15%, so the RPD criterion is not applicable.
- For Aroclor-1254, the samples were re-extracted and reanalyzed for PCBs with no improvement of the results. This indicates that this analyte is not even distributed in the sample.
- For isotopic uranium, rather than redigesting and reanalyzing the new digest, per agreement with the customer POC, the analysis was repeated using the stronger acid digest that is used for the radiochemistry analyses. Both digestions gave high RPDs for the uranium isotopes, indicating an inhomogeneous sample for these isotopes.

- For lead, the customer POC was informed of the high RPD and concurred that this failure was likely due to inhomogeneity in the sample and no repreparation or reanalysis was requested.
- For ^{63}Ni, the customer POC was informed of the failure. Since the RPD was just above the requested limit of <30% at 30.9%, no reanalysis was requested by the customer POC.

Matrix spike recoveries outside of the customer-defined limits were reported for chromium, lead, ^{235}U, ^{238}U, mercury, and Aroclor-1254.

- For mercury and Aroclor-1254, the concentration in the sample was greater than 4 times the concentration of matrix spike added and the criteria are not applicable.
- For chromium, lead, ^{235}U, and ^{238}U, the spike failures were attributed to sample inhomogeneity. The customer POC concurred with this conclusion and did not request repreparation or reanalysis based on these failures. Note that for the isotopic uranium analysis using the stronger acid digestion, no pre-digestion spike was prepared. The post-digestion spike recoveries met the requirements.

Low levels of ^{137}Cs, ^{235}U, ^{238}U, ^{63}Ni, ^{90}Sr, and ^{14}C were detected in the preparation blanks. For ^{14}C, the level in the blank was greater than 5% of the sample results and a "B" flag was applied to the sample results. For all others, the contamination was considered insignificant because the concentration of analyte in the blank was less than 5% of the sample. Since the concentration of analytes in the blank were also less than the quantitation limit, no repreparation or reanalysis was required. The customer POC accepted these results.

Note that for the ^{14}C analysis, the samples were originally counted for the typical 50-minute count. However, upon request from the customer POC to lower the MDA, the samples were recounted for 180 minutes. With this longer count time, ^{14}C was detected in the preparation blank, as discussed above.

Also included is an opportunistic analyte report that includes the opportunistic metals analyzed by ICP. There was a problem with the silicon standard; therefore, no results for silicon were reported. Note that the opportunistic analyte report includes an additional qualifier flag that was not defined above. The "e" flag indicates that the analyte failed to meet the serial dilution criteria. This is applied to manganese, nickel, sulfur, and zinc results. It appears that the results are biased low possibly due to matrix interferences; but possibly due to high solids interfering with the sample uptake. Samples were analyzed with the least possible dilution to try to meet the requested RDLs. Since these were opportunistic analytes, no additional analyses were performed to improve the results.

Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V31

Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000258	A	7440-22-4	Silver	ug/g	80.7	<5.00E-03	<0.931	3.26	2.10	111	81.3	0.931	n/a	U
S10M000258	A	7440-38-2	Arsenic	ug/g	90.9	<0.0500	55.6	48.8	52.2	13.1	86.3	9.31	n/a	J
S10M000258	A	7440-42-8	Boron	ug/g	87.8	<0.0300	24.1	22.2	23.2	7.95	84.2	5.58	n/a	J
S10M000258	A	7440-39-3	Barium	ug/g	95.1	<3.00E-03	2.21E+03	2.73E+03	2.47E+03	21.0	86.3	0.558	n/a	
S10M000258	A	7440-43-9	Cadmium	ug/g	89.1	<5.00E-03	<0.931	<0.921	n/a	n/a	79.9	0.931	n/a	U
S10M000258	A	7440-47-3	Chromium	ug/g	89.1	<5.00E-03	1.43E+03	1.22E+03	1.32E+03	16.0	48.5	0.931	n/a	b
S10M000258	A	7439-92-1	Lead	ug/g	88.6	<0.0500	2.33E+03	1.25E+03	1.79E+03	60.4	-24.7	9.31	n/a	bc
S10M000258	A	15594-54-4	Thorium-229	ug/g	n/a	<9.00E-05	<0.0168	<0.0166	n/a	n/a	n/a	0.0168	n/a	U
S10M000258	A	14269-63-7	Thorium-230	ug/g	n/a	<7.00E-05	<0.0130	<0.0129	n/a	n/a	n/a	0.0130	n/a	U
S10M000258	A	TH-232	Thorium-232	ug/g	104	<1.70E-03	7.62	7.64	7.63	0.262	105	0.316	n/a	
S10M000258	A	13968-55-3	Uranium-233	ug/g	n/a	<1.00E-04	0.0207	<0.0184	n/a	n/a	n/a	0.0186	n/a	J
S10M000258	A	13966-29-5	Uranium-234	ug/g	n/a	<5.00E-05	0.0816	0.0306	0.0561	90.8	n/a	9.31E-03	n/a	J
S10M000258	A	15117-96-1	Uranium-235	ug/g	117	<1.10E-04	10.5	3.81	7.14	93.4	-117	0.0205	n/a	bc
S10M000258	A	13982-70-2	Uranium-236	ug/g	n/a	<4.00E-05	0.197	0.105	0.151	60.9	n/a	7.45E-03	n/a	c
S10M000258	A	U-238	Uranium-238	ug/g	106	<5.50E-03	1.63E+03	6.12E+02	1.12E+03	90.9	-2.31	1.02	n/a	bc
S10M000258	A	7782-49-2	Selenium	ug/g	103	<0.0122	<2.27	<2.25	n/a	n/a	98.5	2.27	n/a	U

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
S10M000256	E	10198-40-0	Cobalt-60	uCi/g	93.8	<3.16E-05	5.23E-03	5.49E-03	5.36E-03	4.87	n/a	1.14E-04	3.13	
S10M000256	E	14234-35-6	Antimony-125	uCi/g	n/a	<9.80E-05	<1.50E-03	<1.34E-03	n/a	n/a	n/a	1.50E-03	n/a	U
S10M000256	E	10045-97-3	Cesium-137	uCi/g	96.5	1.02E-03	0.622	0.504	0.563	20.8	n/a	5.42E-04	4.26	
S10M000256	E	14683-23-9	Europium-152	uCi/g	n/a	<1.90E-04	0.0214	0.0212	0.0213	0.789	n/a	4.89E-04	2.09	
S10M000256	E	15585-10-1	Europium-154	uCi/g	n/a	<9.06E-05	3.45E-03	3.11E-03	3.28E-03	10.2	n/a	3.06E-04	6.80	
S10M000256	E	14391-16-3	Europium-155	uCi/g	n/a	<9.18E-05	<1.09E-03	<9.75E-04	n/a	n/a	n/a	1.09E-03	n/a	U
S10M000256	E	13982-63-3	Radium-226	uCi/g	n/a	<6.20E-04	<7.94E-03	<7.04E-03	n/a	n/a	n/a	7.94E-03	n/a	U
S10M000256	E	14331-83-0	Actinium-228	uCi/g	n/a	<1.35E-04	<5.03E-04	<4.92E-04	n/a	n/a	n/a	5.03E-04	n/a	U
S10M000256	E	14596-10-2	Americium-241	uCi/g	n/a	<1.98E-04	0.0200	0.0174	0.0187	13.9	n/a	3.48E-03	12.65	

NA = Not Analyzed, ND = Not Detected

D - Dilution
c - RPD Outside Range
U - Less Than Detection Limit
J - Estimated
B - Found in Blank
Q - Qualitative
b - MS/MSD Outside Range

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V31

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
S10M000256		E	13968-55-3	Uranium-233	ug/g	n/a	<6.20E-03	7.45E-03	<6.02E-03	n/a	n/a	n/a	6.20E-03	n/a	J
S10M000256		E	13966-29-5	Uranium-234	ug/g	n/a	<3.10E-03	0.0822	0.0394	0.0608	70.4	n/a	3.10E-03	n/a	c
S10M000256		E	15117-96-1	Uranium-235	ug/g	103	9.33E-03	10.0	4.99	7.50	66.8	105	6.83E-03	n/a	c
S10M000256		E	13982-70-2	Uranium-236	ug/g	n/a	<2.48E-03	0.0984	0.0911	0.0947	7.73	n/a	2.48E-03	n/a	
S10M000256		E	U-238	Uranium-238	ug/g	103	1.53	1.47E+03	7.63E+02	1.12E+03	63.2	106	0.341	n/a	c
S10M000256		E	13981-37-8	Nickel-63	uCi/g	116	1.62E-03	1.83	2.50	2.16	30.9	n/a	6.68E-05	0.066	c
S10M000256		E	PU-239/240	Plutonium-239/240	uCi/g	95.1	<1.18E-04	0.0424	0.0363	0.0393	15.6	n/a	1.68E-03	3	
S10M000256		E	13981-16-3	Plutonium-238	uCi/g	n/a	<1.18E-04	<1.68E-03	<1.44E-03	n/a	n/a	n/a	1.68E-03	n/a	U
S10M000256		E	SR-89/90	Strontium-89/90	uCi/g	100	6.80E-04	0.353	0.261	0.307	30.0	n/a	1.36E-04	0.96	
S10M000256		E	14133-76-7	Technetium-99	uCi/g	109	<4.88E-05	3.89E-04	2.20E-04	3.04E-04	55.7	n/a	4.96E-05	15.9	

Sample Portion: PCB Extraction

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000255		O	12674-11-2	Aroclor 1016 Dry	ug/kg	n/a	<54.2	<946	<956	n/a	n/a	n/a	946	n/a	DU
S10M000255		O	11104-28-2	Aroclor 1221 Dry	ug/kg	n/a	<8.96	<156	<158	n/a	n/a	n/a	156	n/a	DU
S10M000255		O	11141-16-5	Aroclor 1232 Dry	ug/kg	n/a	<15.2	<265	<268	n/a	n/a	n/a	265	n/a	DU
S10M000255		O	53469-21-9	Aroclor 1242 Dry	ug/kg	n/a	<36.2	<632	<639	n/a	n/a	n/a	632	n/a	DU
S10M000255		O	12672-29-6	Aroclor 1248 Dry	ug/kg	n/a	<20.5	<358	<361	n/a	n/a	n/a	358	n/a	DU
S10M000255		O	11097-69-1	Aroclor 1254 Dry	ug/kg	85.9	<13.1	2.57E+04	8.37E+03	1.70E+04	102	-1.96E+03	229	n/a	Dc
S10M000255		O	11096-82-5	Aroclor 1260 Dry	ug/kg	n/a	<21.2	<370	<374	n/a	n/a	n/a	370	n/a	DU

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000253			BULK DENSI	Bulk density	g/mL	n/a	n/a	1.53	1.50	1.52	1.65	n/a	1.00E-03	n/a	Q
S10M000253			%WATER	Percent water	%	98.5	n/a	4.06	3.92	3.99	3.51	n/a	0.0100	n/a	
S10M000253			7439-97-6	Mercury	ug/g	102	<1.00E-04	31.2	32.2	31.7	3.24	-54.6	0.571	n/a	
S10M000253			PH	pH	unitless	n/a	n/a	7.49	7.46	7.48	0.401	n/a	0.0100	n/a	

NA = Not Analyzed, ND = Not Detected

D - Dilution
c - RPD Outside Range
U - Less Than Detection Limit
J - Estimated
B - Found in Blank
Q - Qualitative
b - MS/MSD Outside Range

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V31

Sample Portion: Water Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000257		W	14762-75-5	Carbon-14	uCi/g	88.6	3.95E-05	1.42E-04	2.40E-04	1.91E-04	51.3	87.3	2.67E-05	21.514	B
S10M000257		W	10028-17-8	Tritium	uCi/g	101	<1.56E-06	<3.24E-04	<4.11E-04	n/a	n/a	97.5	3.24E-04	n/a	U

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b - MS/MSD Outside Range

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V32

Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000264	A	7440-22-4	Silver	ug/g	80.7	<5.00E-03	<0.946	n/a	n/a	n/a	n/a	0.946	n/a	U
S10M000264	A	7440-38-2	Arsenic	ug/g	90.9	<0.0500	51.0	n/a	n/a	n/a	n/a	9.46	n/a	J
S10M000264	A	7440-42-8	Boron	ug/g	87.8	<0.0300	20.3	n/a	n/a	n/a	n/a	5.68	n/a	J
S10M000264	A	7440-39-3	Barium	ug/g	95.1	<3.00E-03	2.37E+03	n/a	n/a	n/a	n/a	0.568	n/a	
S10M000264	A	7440-43-9	Cadmium	ug/g	89.1	<5.00E-03	<0.946	n/a	n/a	n/a	n/a	0.946	n/a	U
S10M000264	A	7440-47-3	Chromium	ug/g	89.1	<5.00E-03	1.03E+03	n/a	n/a	n/a	n/a	0.946	n/a	b
S10M000264	A	7439-92-1	Lead	ug/g	88.6	<0.0500	1.10E+03	n/a	n/a	n/a	n/a	9.46	n/a	bc
S10M000264	A	15594-54-4	Thorium-229	ug/g	n/a	<9.00E-05	<0.0170	n/a	n/a	n/a	n/a	0.0170	n/a	U
S10M000264	A	14269-63-7	Thorium-230	ug/g	n/a	<7.00E-05	<0.0132	n/a	n/a	n/a	n/a	0.0132	n/a	U
S10M000264	A	TH-232	Thorium-232	ug/g	104	<1.70E-03	3.60	n/a	n/a	n/a	n/a	0.322	n/a	
S10M000264	A	13968-55-3	Uranium-233	ug/g	n/a	<1.00E-04	<0.0189	n/a	n/a	n/a	n/a	0.0189	n/a	U
S10M000264	A	13966-29-5	Uranium-234	ug/g	n/a	<5.00E-05	0.0807	n/a	n/a	n/a	n/a	9.46E-03	n/a	J
S10M000264	A	15117-96-1	Uranium-235	ug/g	117	<1.10E-04	9.82	n/a	n/a	n/a	n/a	0.0208	n/a	bc
S10M000264	A	13982-70-2	Uranium-236	ug/g	n/a	<4.00E-05	0.175	n/a	n/a	n/a	n/a	7.57E-03	n/a	c
S10M000264	A	U-238	Uranium-238	ug/g	106	<5.50E-03	1.48E+03	n/a	n/a	n/a	n/a	1.04	n/a	bc
S10M000264	A	7782-49-2	Selenium	ug/g	103	<0.0122	<2.31	n/a	n/a	n/a	n/a	2.31	n/a	U

Sample Portion: PCB Extraction

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000261	O	12674-11-2	Aroclor 1016 Dry	ug/kg	n/a	<54.2	<553	n/a	n/a	n/a	n/a	553	n/a	DU
S10M000261	O	11104-28-2	Aroclor 1221 Dry	ug/kg	n/a	<8.96	<91.4	n/a	n/a	n/a	n/a	91.4	n/a	DU
S10M000261	O	11141-16-5	Aroclor 1232 Dry	ug/kg	n/a	<15.2	<155	n/a	n/a	n/a	n/a	155	n/a	DU
S10M000261	O	53469-21-9	Aroclor 1242 Dry	ug/kg	n/a	<36.2	<370	n/a	n/a	n/a	n/a	370	n/a	DU
S10M000261	O	12672-29-6	Aroclor 1248 Dry	ug/kg	n/a	<20.5	<209	n/a	n/a	n/a	n/a	209	n/a	DU
S10M000261	O	11097-69-1	Aroclor 1254 Dry	ug/kg	85.9	<13.1	5.72E+03	n/a	n/a	n/a	n/a	134	n/a	Dc
S10M000261	O	11096-82-5	Aroclor 1260 Dry	ug/kg	n/a	<21.2	<216	n/a	n/a	n/a	n/a	216	n/a	DU

NA = Not Analyzed, ND = Not Detected

D - Dilution
c - RPD Outside Range
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b - MS/MSD Outside Range

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V32

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000259			BULK DENSI	Bulk density	g/mL	n/a	n/a	1.48	n/a	n/a	n/a	n/a	1.00E-03	n/a	Q
S10M000259			%WATER	Percent water	%	98.5	n/a	3.33	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000259			7439-97-6	Mercury	ug/g	102	<1.00E-04	98.5	n/a	n/a	n/a	n/a	0.604	n/a	
S10M000259			PH	pH	unitless	n/a	n/a	7.17	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
S10M000263		W	14762-75-5	Carbon-14	uCi/g	88.6	3.95E-05	4.69E-05	n/a	n/a	n/a	n/a	2.47E-05	49.832	BJ
S10M000263		W	10028-17-8	Tritium	uCi/g	101	<1.56E-06	<4.14E-04	n/a	n/a	n/a	n/a	4.14E-04	n/a	U

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
S10M000262		E	10198-40-0	Cobalt-60	uCi/g	93.8	<3.16E-05	4.42E-03	n/a	n/a	n/a	n/a	1.10E-04	3.32	
S10M000262		E	14234-35-6	Antimony-125	uCi/g	n/a	<9.80E-05	<1.49E-03	n/a	n/a	n/a	n/a	1.49E-03	n/a	U
S10M000262		E	10045-97-3	Cesium-137	uCi/g	96.5	1.02E-03	0.608	n/a	n/a	n/a	n/a	5.56E-04	4.26	
S10M000262		E	14683-23-9	Europium-152	uCi/g	n/a	<1.90E-04	0.0293	n/a	n/a	n/a	n/a	5.38E-04	1.90	
S10M000262		E	15585-10-1	Europium-154	uCi/g	n/a	<9.06E-05	4.10E-03	n/a	n/a	n/a	n/a	3.78E-04	6.19	
S10M000262		E	14391-16-3	Europium-155	uCi/g	n/a	<9.18E-05	<1.11E-03	n/a	n/a	n/a	n/a	1.11E-03	n/a	U
S10M000262		E	13982-63-3	Radium-226	uCi/g	n/a	<6.20E-04	<7.95E-03	n/a	n/a	n/a	n/a	7.95E-03	n/a	U
S10M000262		E	14331-83-0	Actinium-228	uCi/g	n/a	<1.35E-04	<5.34E-04	n/a	n/a	n/a	n/a	5.34E-04	n/a	U
S10M000262		E	14596-10-2	Americium-241	uCi/g	n/a	<1.98E-04	0.0218	n/a	n/a	n/a	n/a	3.11E-03	11.08	
S10M000262		E	13968-55-3	Uranium-233	ug/g	n/a	<6.20E-03	0.0187	n/a	n/a	n/a	n/a	6.31E-03	n/a	J
S10M000262		E	13966-29-5	Uranium-234	ug/g	n/a	<3.10E-03	0.0389	n/a	n/a	n/a	n/a	3.15E-03	n/a	
S10M000262		E	15117-96-1	Uranium-235	ug/g	103	9.33E-03	5.79	n/a	n/a	n/a	n/a	6.94E-03	n/a	
S10M000262		E	13982-70-2	Uranium-236	ug/g	n/a	<2.48E-03	0.118	n/a	n/a	n/a	n/a	2.52E-03	n/a	
S10M000262		E	U-238	Uranium-238	ug/g	103	1.53	888	n/a	n/a	n/a	n/a	0.347	n/a	
S10M000262		E	13981-37-8	Nickel-63	uCi/g	116	1.62E-03	0.667	n/a	n/a	n/a	n/a	6.74E-05	0.11	
S10M000262		E	PU-239/240	Plutonium-239/240	uCi/g	95.1	<1.18E-04	0.0405	n/a	n/a	n/a	n/a	1.58E-03	3.04	

NA = Not Analyzed, ND = Not Detected

D - Dilution
c - RPD Outside Range
U - Less Than Detection Limit
J - Estimated
B - Found in Blank
Q - Qualitative
b - MS/MSD Outside Range

105B Transfer Pit
Data Summary Report

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V32

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
S10M000262		E	13981-16-3	Plutonium-238	uCi/g	n/a	<1.18E-04	<1.58E-03	n/a	n/a	n/a	n/a	1.58E-03	n/a	U
S10M000262		E	SR-89/90	Strontium-89/90	uCi/g	100	6.80E-04	0.366	n/a	n/a	n/a	n/a	1.39E-04	0.96	
S10M000262		E	14133-76-7	Technetium-99	uCi/g	109	<4.88E-05	3.06E-04	n/a	n/a	n/a	n/a	5.01E-05	19	

NA = Not Analyzed, ND = Not Detected

D - Dilution
c - RPD Outside Range
U - Less Than Detection Limit
J - Estimated
B - Found in Blank
Q - Qualitative
b - MS/MSD Outside Range

105B Transfer Pit
Opportunistic Analyte Results

Sample Group: 20100314
Customer Group or SDG Number: 222S20100314
Customer Sample ID: J19V31
Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000258	A	7429-90-5	Aluminum	ug/g	89.3	<0.0300	2.07E+04	1.86E+04	1.97E+04	10.7	-97.8	5.58	n/a	
S10M000258	A	7440-41-7	Beryllium	ug/g	98.5	<1.00E-03	0.404	0.435	0.419	7.39	91.7	0.186	n/a	
S10M000258	A	7440-69-9	Bismuth	ug/g	87.5	<0.100	<18.6	<18.4	n/a	n/a	81.2	18.6	n/a	U
S10M000258	A	7440-70-2	Calcium	ug/g	84.6	<0.0500	5.16E+03	5.24E+03	5.20E+03	1.47	328	9.31	n/a	
S10M000258	A	7440-45-1	Cerium	ug/g	93.3	<0.0300	<5.58	<5.53	n/a	n/a	n/a	5.58	n/a	U
S10M000258	A	7440-48-4	Cobalt	ug/g	88.5	<0.0100	23.0	20.0	21.5	14.1	85.4	1.86	n/a	
S10M000258	A	7440-50-8	Copper	ug/g	95.2	<5.00E-03	233	194	213	18.4	95.0	0.931	n/a	
S10M000258	A	7440-53-1	Europium	ug/g	91.0	<5.00E-03	44.5	37.3	40.9	17.5	n/a	0.931	n/a	
S10M000258	A	7439-89-6	Iron	ug/g	89.3	<5.00E-03	2.33E+05	2.20E+05	2.27E+05	5.74	-3.56E+03	0.931	n/a	
S10M000258	A	7440-09-7	Potassium	ug/g	91.6	<0.500	328	311	319	5.43	83.0	93.1	n/a	J
S10M000258	A	7439-91-0	Lanthanum	ug/g	94.4	<3.00E-03	<0.558	<0.553	n/a	n/a	87.7	0.558	n/a	U
S10M000258	A	7439-93-2	Lithium	ug/g	101	<3.00E-03	4.34	4.24	4.29	2.25	87.1	0.558	n/a	J
S10M000258	A	7439-95-4	Magnesium	ug/g	88.5	<0.0500	2.39E+03	2.24E+03	2.31E+03	6.48	117	9.31	n/a	
S10M000258	A	7439-96-5	Manganese	ug/g	88.6	<3.00E-03	451	483	467	6.87	84.8	0.558	n/a	e
S10M000258	A	7439-98-7	Molybdenum	ug/g	89.0	<0.0200	31.3	26.7	29.0	15.7	85.6	3.72	n/a	J
S10M000258	A	7440-23-5	Sodium	ug/g	99.1	<0.100	164	205	184	22.4	102	18.6	n/a	J
S10M000258	A	7440-00-8	Neodymium	ug/g	94.4	<0.0100	11.8	10.5	11.2	12.3	n/a	1.86	n/a	J
S10M000258	A	7440-02-0	Nickel	ug/g	87.1	<0.0200	207	171	189	19.3	79.3	3.72	n/a	e
S10M000258	A	7723-14-0	Phosphorus	ug/g	88.7	<0.0500	622	586	604	5.80	81.7	9.31	n/a	
S10M000258	A	7704-34-9	Sulfur	ug/g	89.7	<0.100	2.17E+03	2.22E+03	2.19E+03	2.04	65.8	18.6	n/a	be
S10M000258	A	7440-36-0	Antimony	ug/g	87.1	<0.0500	<9.31	<9.21	n/a	n/a	77.1	9.31	n/a	U
S10M000258	A	7440-19-9	Samarium	ug/g	94.6	<0.0500	<9.31	<9.21	n/a	n/a	n/a	9.31	n/a	U
S10M000258	A	7440-24-6	Strontium	ug/g	94.1	<3.00E-03	44.2	49.3	46.8	11.0	88.2	0.558	n/a	
S10M000258	A	7440-29-1	Thorium	ug/g	89.0	<0.0500	36.5	27.8	32.1	26.9	n/a	9.31	n/a	J
S10M000258	A	7440-32-6	Titanium	ug/g	88.7	<5.00E-03	779	672	726	14.7	86.4	0.931	n/a	e
S10M000258	A	7440-28-0	Thallium	ug/g	83.2	<0.100	582	517	549	11.8	n/a	18.6	n/a	
S10M000258	A	7440-61-1	Uranium	ug/g	99.7	<0.100	1.36E+03	3.90E+02	8.77E+02	111	-23.8	18.6	n/a	bc
S10M000258	A	7440-62-2	Vanadium	ug/g	92.1	<5.00E-03	35.9	31.5	33.7	13.2	88.0	0.931	n/a	
S10M000258	A	7440-65-5	Yttrium	ug/g	88.8	<2.00E-03	4.27	4.02	4.14	6.01	n/a	0.372	n/a	

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
b - MS/MSD Outside Range
c - RPD Outside Range
e - SERDIL Outside Range

105B Transfer Pit
Opportunistic Analyte Results

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V31

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000258		A	7440-66-6	Zinc	ug/g	89.7	<5.00E-03	2.99E+03	2.94E+03	2.97E+03	1.68	167	0.931	n/a	be
S10M000258		A	7440-67-7	Zirconium	ug/g	88.4	<5.00E-03	5.96	1.19	3.57	134	83.4	0.931	n/a	J

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated

b - MS/MSD Outside Range

c - RPD Outside Range

e - SERDIL Outside Range

105B Transfer Pit
Opportunistic Analyte Results

Sample Group: 20100314
Customer Group or SDG Number: 222S20100314
Customer Sample ID: J19V32
Sample Portion: Acid Digest

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000264	A	7429-90-5	Aluminum	ug/g	89.3	<0.0300	1.45E+04	n/a	n/a	n/a	n/a	5.68	n/a	
S10M000264	A	7440-41-7	Beryllium	ug/g	98.5	<1.00E-03	0.354	n/a	n/a	n/a	n/a	0.189	n/a	J
S10M000264	A	7440-69-9	Bismuth	ug/g	87.5	<0.100	<18.9	n/a	n/a	n/a	n/a	18.9	n/a	U
S10M000264	A	7440-70-2	Calcium	ug/g	84.6	<0.0500	5.20E+03	n/a	n/a	n/a	n/a	9.46	n/a	
S10M000264	A	7440-45-1	Cerium	ug/g	93.3	<0.0300	<5.68	n/a	n/a	n/a	n/a	5.68	n/a	U
S10M000264	A	7440-48-4	Cobalt	ug/g	88.5	<0.0100	19.2	n/a	n/a	n/a	n/a	1.89	n/a	
S10M000264	A	7440-50-8	Copper	ug/g	95.2	<5.00E-03	460	n/a	n/a	n/a	n/a	0.946	n/a	
S10M000264	A	7440-53-1	Europium	ug/g	91.0	<5.00E-03	28.7	n/a	n/a	n/a	n/a	0.946	n/a	
S10M000264	A	7439-89-6	Iron	ug/g	89.3	<5.00E-03	1.89E+05	n/a	n/a	n/a	n/a	0.946	n/a	
S10M000264	A	7440-09-7	Potassium	ug/g	91.6	<0.500	316	n/a	n/a	n/a	n/a	94.6	n/a	J
S10M000264	A	7439-91-0	Lanthanum	ug/g	94.4	<3.00E-03	<0.568	n/a	n/a	n/a	n/a	0.568	n/a	U
S10M000264	A	7439-93-2	Lithium	ug/g	101	<3.00E-03	4.13	n/a	n/a	n/a	n/a	0.568	n/a	J
S10M000264	A	7439-95-4	Magnesium	ug/g	88.5	<0.0500	2.40E+03	n/a	n/a	n/a	n/a	9.46	n/a	
S10M000264	A	7439-96-5	Manganese	ug/g	88.6	<3.00E-03	418	n/a	n/a	n/a	n/a	0.568	n/a	e
S10M000264	A	7439-98-7	Molybdenum	ug/g	89.0	<0.0200	21.8	n/a	n/a	n/a	n/a	3.78	n/a	J
S10M000264	A	7440-23-5	Sodium	ug/g	99.1	<0.100	173	n/a	n/a	n/a	n/a	18.9	n/a	
S10M000264	A	7440-00-8	Neodymium	ug/g	94.4	<0.0100	10.6	n/a	n/a	n/a	n/a	1.89	n/a	J
S10M000264	A	7440-02-0	Nickel	ug/g	87.1	<0.0200	245	n/a	n/a	n/a	n/a	3.78	n/a	e
S10M000264	A	7723-14-0	Phosphorus	ug/g	88.7	<0.0500	567	n/a	n/a	n/a	n/a	9.46	n/a	
S10M000264	A	7704-34-9	Sulfur	ug/g	89.7	<0.100	1.75E+03	n/a	n/a	n/a	n/a	18.9	n/a	be
S10M000264	A	7440-36-0	Antimony	ug/g	87.1	<0.0500	<9.46	n/a	n/a	n/a	n/a	9.46	n/a	U
S10M000264	A	7440-19-9	Samarium	ug/g	94.6	<0.0500	<9.46	n/a	n/a	n/a	n/a	9.46	n/a	U
S10M000264	A	7440-24-6	Strontium	ug/g	94.1	<3.00E-03	44.4	n/a	n/a	n/a	n/a	0.568	n/a	
S10M000264	A	7440-29-1	Thorium	ug/g	89.0	<0.0500	34.3	n/a	n/a	n/a	n/a	9.46	n/a	J
S10M000264	A	7440-32-6	Titanium	ug/g	88.7	<5.00E-03	808	n/a	n/a	n/a	n/a	0.946	n/a	e
S10M000264	A	7440-28-0	Thallium	ug/g	83.2	<0.100	400	n/a	n/a	n/a	n/a	18.9	n/a	
S10M000264	A	7440-61-1	Uranium	ug/g	99.7	<0.100	1.18E+03	n/a	n/a	n/a	n/a	18.9	n/a	bc
S10M000264	A	7440-62-2	Vanadium	ug/g	92.1	<5.00E-03	31.9	n/a	n/a	n/a	n/a	0.946	n/a	
S10M000264	A	7440-65-5	Yttrium	ug/g	88.8	<2.00E-03	3.88	n/a	n/a	n/a	n/a	0.378	n/a	

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
b - MS/MSD Outside Range
c - RPD Outside Range
e - SERDIL Outside Range

105B Transfer Pit
Opportunistic Analyte Results

Sample Group: 20100314

Customer Group or SDG Number: 222S20100314

Customer Sample ID: J19V32

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000264		A	7440-66-6	Zinc	ug/g	89.7	<5.00E-03	2.47E+03	n/a	n/a	n/a	n/a	0.946	n/a	be
S10M000264		A	7440-67-7	Zirconium	ug/g	88.4	<5.00E-03	<0.946	n/a	n/a	n/a	n/a	0.946	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated

b - MS/MSD Outside Range

c - RPD Outside Range

e - SERDIL Outside Range

2225 20100314

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-158-1	Page 2 of 2
Collector: Karl Hulse / MS McCOY	Company Contact: ~~Mike Stankovich~~ Tom Edmundson	Telephone No.: 509-~~430-7112~~ 947-5192	Project Coordinator: KESSNER, JH	Price Code
Project Designation: 105-B Transfer Pit Sediments & Legacy Wastes	Sampling Location: 105-B KEF 3-18-10	KEF 3-18-10	SAF No.: RC-158	Data Turnaround: 60 Days
Ice Chest No.: TYPE A BOX	Field Logbook No.: EL-1518-12	COA: R105B01000	Method of Shipment: ~~FEDEX~~ TRE 3-22-10 Gov't Vehicle	
Shipped To: 222-S Lab Operations	Offsite Property No.: ~~See OSPC~~ TRE 3-22-10 N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad Inactive

Special Handling and/or Storage

~~Cold Adjacent~~ N/A

TRE 3-29-10

Preservation	None	None	None	None	None	Cool 4C	None	None	None	None
Type of Container	G/P	G	G/P	G/P	G/P	aG	G/P	G/P	G/P	G/P
No. of Container(s)	2	0 *	0 *	0 *	0 *	0 *	0 *	0 *	0 *	0 *
Volume	60mL 125 mL	60ml KEF 3-18-10	5ml	60ml	60ml	60ml	60ml	60ml	60ml	60ml
SAMPLE ANALYSIS	See item (1) on Special Instructions	See item (2) on Special Instructions	Density	Moisture Content D2216	pH (Soil) 9045	PCBs 8082	See item (3) on Special Instructions	Isotopic Uranium ICPMS	Isotopic Thorium ICPMS	Isotopic Plutonium

Sample No.	Matrix *	Sample Date	Sample Time										
J19V31 S10M000253	OTHER SOLID	3-18-10	1015	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
J19V32 S10M000259	OTHER SOLID	3-18-10	1115	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group# 2225	20100314												

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: MS McCoy CHPRC	Date/Time: 3-29-10 1545	Received By/Stored In: [signature]	Date/Time: 3-29-10 1545
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
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

Do not run TCLP without speaking with Joan Kessner

(1) ICP Metals - 6010 (Client List) (Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Lead, Selenium, Silver) Mercury - 7471 - (CV) (Mercury)
(2) Metals by ICP (TCLP) - 1311 6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) Mercury (TCLP) - 1311 7470 (Mercury)
(3) Gamma Spec (Client List) (Americium-241, Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226, Radium-228)

* Run with item(1) volume

Matrix *

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-158-1	Page 2 of 2

Collector: Karl Halse / MS McCoy	Company Contact: ~~Mike Stankovich~~ Tom Edmundson; Telephone No.: 509-~~430-7142~~ 947-5192	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: 60 Days
Project Designation: 105-B Transfer Pit Sediments & Legacy Wastes	Sampling Location: 105-B; KGF 3-18-10; KGF 3-18-10	SAF No.: RC-158	
Ice Chest No.: TYPE A BOX	Field Logbook No.: EL-1518-12; COA: R105B01000	Method of Shipment: ~~FEDEX~~ TRE 3-22-10 Gov't Vehicle	
Shipped To: 222-S Lab Operations	Offsite Property No.: ~~See OSPC~~ TRE 3-22-10 N/A	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive

Special Handling and or Storage

~~Cold 4 degrees C~~ TRE 3-29-10

Preservation	None	None	None	None	None						
Type of Container	G/P	G	G/P	G/P	G/P						
No. of Container(s)	0 *	0 *	0 *	0 *	0 *						
Volume	60ml	60ml	60ml	60ml	60ml						
SAMPLE ANALYSIS	Carbon 14	Tritium H3	Nickel 63	Strontium 90	Technetium 99						

Sample No.	Matrix *	Sample Date	Sample Time										
019V31	OTHER SOLID	3-18-10	1045	✓	✓	✓	✓	✓					
019V32	OTHER SOLID	3-18-10	1115	✓	✓	✓	✓	✓					

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By Removed From: MS McCoy CHPRC	Date/Time: 3-29-10 1545	Received By/Stored In: [signature]	Date/Time: 3-29-10 1545
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
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

Do not run TCLP without speaking with Joan Kessner

* Run with item (1) volume (Page 1 of 2)

Matrix *: S=Soil; SF=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011