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Richland, WA 99352

0054711

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FLUOR GLOBAL SERVICES

FH-0100700

J. H. Kessner, Program Manager
Analytical Services H9-03
Bechtel Hanford
Richland, Washington 99352

Dear Ms. Kessner:

FINAL RESULTS FOR THE 221-U CANYON DRAIN PIPE SLUDGE SAMPLE – SDG1

- References:
1. Letter, J. L. Jacobsen (FDH) from J. J. McGuire (BHI), "Letter of Instruction for the 221-U Canyon Disposition Initiative Sample Analysis", Number 081727, dated August 31, 2000.
 2. Clark, G. A., 2001, *222-S Laboratory Quality Assurance Plan*, HNF-SD-CD-QAPP-016, Rev. 4A, Fluor Hanford, Richland, Washington.

This letter presents the final results for the drainpipe sludge sample (B10331) received from the 221-U Facility on September 20, 2000. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Letter of Instruction for the 221-U Canyon Disposition Initiative Sample Analysis (LOI)*, referenced above. The following information is included.

- Attachment 1: Narrative
- Attachment 2: Data Summary Report
- Attachment 3: Sample Breakdown Diagram
- Attachment 4: Chain of Custody and Request for Sample Analysis forms

If you have any questions regarding this report, please feel free to call me on 373-4314.

Sincerely,



Ruth A Esch, Project Coordinator
Analytical Services

RAE:lda

Attachments (4)

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ATTACHMENT 1

NARRATIVE

Consisting of 4 pages,
Including cover page

FINAL RESULTS FOR THE 221-U CANYON DRAIN PIPE SLUDGE SAMPLE – SDG1

A sample of drainpipe sludge (B10331) was received from the 221-U Facility on September 20, 2000. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Letter of Instruction for the 221-U Canyon Disposition Initiative Sample Analysis (LOI)*, referenced in the cover letter.

The sample was analyzed for polychlorinated biphenyls (PCB). Aroclor 1254 was observed above the TSCA regulated limit of 50 ppm (111 ppm). The unused sample, sample digests and waste generated from the analyses was handled as "Known PCB".

Toxicity Characterization Leaching Procedure (TCLP)

The COC requested metals by inductively coupled plasma (ICP) analysis; add on bismuth (Bi). The LOI for this project lists the Toxicity Characteristic Leaching Procedure (TCLP) metals by ICP with Bi, aluminum (Al) and phosphorous (P) added. These were the ICP metals that were included in this report. Mercury (Hg) was analyzed by the cold vapor atomic absorption (CVAA) method. All TCLP metals, except arsenic (As) and selenium (Se) were detected in the sample. Since the analysis was performed as total metals, rather than a TCLP extraction, the results were compared to 20 times the TCLP regulatory limits. Chromium (Cr), Lead (Pb) and mercury all had concentrations exceeding 20 times the TCLP regulatory limits.

Sample Appearance and Handling

B10331: The sample was dark brown in color and appeared oily. The texture was similar to an oily dirt with large particle size, pebble-like pieces approximately ¼ inch or less in diameter. When the sample was homogenized using a coffee grinder, it sounded like there were very hard pieces of material mixed in the sample. It sounded like we were grinding small stones. Although we ground the sample for several minutes, until it sounded as though the pieces might have become an even mixture of particles, it was likely that representative duplicate aliquots would not be obtainable.

Analytical Results

At the time that the semi-volatile organic analysis (SVOA) was performed for this sample, the complete target compound list was not set-up in the Laboratory Information Management System (LIMS). The compounds that were set-up at the time were included in the Data Summary Report. No tentatively identified compounds (TICs) were reported.

Holding Times

The SW-846 holding times were not met for mercury Hg (28 days), PCB and SVOA extractions (14 days), nitrate (48 hours) and chloride and sulfate (28 days). Holding times were not met because of the 28-day delay between the sampling and receipt dates.

Exceeding the holding time for the PCB analysis does not invalidate the results because the concentration found exceeded the regulatory limit of 50 ppm.

Quality Control Results

Standard Recovery

All laboratory control standard (LCS) recoveries were acceptable in accordance with the 222-S Laboratory Quality Assurance Plan (QAPP-016 2000) except for the Pb by ICP (76.6%), N-Nitroso-di-n-propylamine (66.0%) and 2,4-Dinitrotoluene (68.0%).

The recovery of the LCS for Pb (76.6%) was only slightly below the lower acceptance limit of 80% for an acid digested standard. No reanalysis was requested because the standard recovery was only 3.4% outside of the acceptance limit and the highest reported sample result was 700 times the TCLP regulatory limit for Pb.

The recovery for the N-Nitroso-di-n-propylamine (66.0%) and 2,4-Dinitrotoluene (68.0%) were lower than the default acceptance limits of 70% - 130% recovery that were set in the Laboratory LIMS system. The lower recovery might be due to volatilization during the concentration process prior to analysis. These compounds have a wider acceptance range listed in SW-846 method 8270. With the procedure currently available, a reanalysis would not improve the sample results because of the dilution and would not necessarily improve the LCS recoveries for these two compounds. Verbal concurrence was received from the project contact to accept the results as reported, but a request was made to reanalyze the samples at the 222-S Laboratory when the new procedure is active.

Preparation Blanks

Low levels of contamination from chloride and fluoride were detected in the preparation blank from the water leach. Since the concentration of these analytes detected in the blank were less than 5% of those detected for the sample, the contamination was considered insignificant and no reanalysis was requested.

Relative Percent Difference (RPD)

The relative percent difference (RPD) between sample and duplicate results for many analytes were greater than the limit of <20% listed in QAPP-016. As discussed previously, these high RPDs were attributed to the non-homogenous nature of the sample. No reanalyses were requested based on the high RPDs because it was believed that the sample could not be homogenized any further.

Matrix Spike Recoveries

The matrix spike recoveries for several analytes were outside of the acceptance limits listed in QAPP-016. The analytes that failed were aluminum (133.5%), chromium (33.67%), lead (-0.151%) and Aroclor 1254 (-2.33e+03%). The failures were attributed to a combination of sample inhomogeneity and analyte concentrations that were greater than four times the concentration of the matrix spike added. In this situation, the recovery criteria were not applicable, and no reanalyses were requested.

Surrogate Recoveries

For the PCB and semi-volatile organic analysis (SVOA), surrogate standards were added to the samples to assess the accuracy of the method. The acceptance limits stated in QAPP-016 for these standards are 50% to 150% recovery. For the SVOA analysis, all of the surrogate recoveries for the LCS and method blank met these criteria. For the SVOA sample, duplicate and matrix spike aliquots, the samples were diluted to reduce the activity of radionuclides in the sample so that the extracts could be analyzed at the Waste Sampling and Characterization Facility (WSCF), so the surrogate standards were undetected. The reanalysis with less dilution could not be performed at this time.

For the PCB analysis, all of the surrogate standard recoveries were within the acceptance limits except for tetrachloro-m-xylene (TCX) for the sample (47%) and matrix spike duplicate (41%) aliquots. These low recoveries were attributed to the large sample dilution required for the high concentration of Aroclor 1254 in the sample. It was considered impractical to re-extract with a higher concentration of surrogate. The results were considered acceptable and no reanalysis was requested.

Practical Quantitation Limits (PQL)

The requested practical quantitation limits (PQLs) were met for all analytes.

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ATTACHMENT 2

DATA SUMMARY REPORT

Consisting of 3 pages,
Including cover page

Data Summary Report
221U SDG1

CORE NUMBER: n/a
SEGMENT #: B10331

SEGMENT PORTION: Acid Digest

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S00M000400		A	Silver -ICP-Acid Digest	ug/g	80.30	<0.0100	56.40	42.70	49.55	27.6	86.06	3.180		n/a
S00M000400		A	Aluminium -ICP-Acid Digest	ug/g	83.40	<0.0500	2.25e+03	2.03e+03	2.14e+03	10.3	133.5	15.90		n/a
S00M000400		A	Arsenic -ICP-Acid Digest	ug/g	86.80	<0.100	< 31.80	<31.7	n/a	n/a	94.79	31.80		n/a
S00M000400		A	Barium -ICP-Acid Digest	ug/g	89.20	<0.0500	1.32e+02	110.0	121.0	18.2	95.54	15.90		n/a
S00M000400		A	Bismuth -ICP-Acid Digest	ug/g	81.60	<0.100	33.50	<31.7	n/a	n/a	91.05	31.80		n/a
S00M000400		A	Cadmium -ICP-Acid Digest	ug/g	82.20	<0.00500	85.50	61.20	73.35	33.1	88.55	1.590		n/a
S00M000400		A	Chromium -ICP-Acid Digest	ug/g	81.20	<0.0100	1.87e+03	1.47e+03	1.67e+03	24.0	33.67	3.180		n/a
S00M000400		A	Phosphorus -ICP-Acid Digest	ug/g	84.20	<0.200	1.90e+03	1.75e+03	1.82e+03	8.22	101.6	63.50		n/a
S00M000400		A	Lead -ICP-Acid Digest	ug/g	76.60	<0.100	3.50e+03	1.85e+03	2.68e+03	61.7	-1.51e-01	31.80		n/a
S00M000400		A	Selenium -ICP-Acid Digest	ug/g	83.40	<0.100	< 31.80	<31.7	n/a	n/a	86.06	31.80		n/a

Direct Sludge: Direct Sludge

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S00M000388			Aroclor-1232	ug/Kg	n/a	ND	ND	n/a	n/a	n/a	n/a	8.00e+03		n/a
S00M000388			Aroclor-1242	ug/Kg	n/a	ND	ND	n/a	n/a	n/a	n/a	8.00e+03		n/a
S00M000388			Aroclor-1248	ug/Kg	n/a	ND	ND	n/a	n/a	n/a	n/a	8.00e+03		n/a
S00M000388			Aroclor-1254	ug/Kg	112.0	ND	1.11e+05	n/a	n/a	n/a	-2.33e+03	8.00e+03		n/a
S00M000388			Aroclor-1260	ug/Kg	n/a	ND	ND	n/a	n/a	n/a	n/a	8.00e+03		n/a
S00M000441			Decane (C10)	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	8.94e+05		n/a
S00M000441			Dodecane	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	1.01e+07		n/a
S00M000441			Tetradecane	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	1.12e+06		n/a
S00M000441			Pentachlorophenol	ug/Kg	78.00	ND	ND	ND	n/a	n/a	n/a	2.68e+06		n/a
S00M000441			Phenol	ug/Kg	83.00	ND	ND	ND	n/a	n/a	n/a	4.26e+05		n/a
S00M000441			Tris(2-chloroethyl)phosphate	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	5.61e+05		n/a
S00M000441			Benzothiazole	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	3.74e+05		n/a
S00M000441			bis(2-Ethylhexyl)phthalate	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	5.76e+05		n/a
S00M000441			2,4-Dichlorophenol	ug/Kg	n/a	n/a	ND	ND	n/a	n/a	n/a	4.90e+05		n/a
S00M000441			2-Nitrophenol	ug/Kg	n/a	n/a	ND	ND	n/a	n/a	n/a	6.43e+05		n/a
S00M000441			2-Picoline	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	2.39e+05		n/a
S00M000441			2-Chlorophenol	ug/Kg	72.00	ND	ND	ND	n/a	n/a	n/a	3.63e+05		n/a
S00M000441			Pyrene	ug/Kg	88.00	ND	ND	ND	n/a	n/a	n/a	4.49e+05		n/a
S00M000441			N-Nitroso-di-n-propylamine	ug/Kg	66.00	ND	ND	ND	n/a	n/a	n/a	5.24e+05		n/a
S00M000441			1,2,4-Trichlorobenzene SV	ug/Kg	74.00	ND	ND	ND	n/a	n/a	n/a	1.02e+06		n/a
S00M000441			4-Chloro-3-methylphenol	ug/Kg	82.00	ND	ND	ND	n/a	n/a	n/a	7.59e+05		n/a
S00M000441			Acenaphthene	ug/Kg	72.00	ND	ND	ND	n/a	n/a	n/a	9.01e+05		n/a
S00M000441			4-Nitrophenol	ug/Kg	75.00	ND	ND	ND	n/a	n/a	n/a	2.99e+06		n/a
S00M000441			2,4-Dinitrotoluene	ug/Kg	68.00	ND	ND	ND	n/a	n/a	n/a	5.83e+05		n/a
S00M000441			Acetophenone	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	4.45e+05		n/a
S00M000441			Benzyl alcohol	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	6.17e+05		n/a
S00M000441			2-Butoxyethanol	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	4.60e+05		n/a
S00M000441			2-Methylphenol	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	6.58e+05		n/a
S00M000441			3 & 4 Methylphenol Total	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	5.65e+05		n/a
S00M000441			1,4-Dichlorobenzene	ug/Kg	70.00	ND	ND	ND	n/a	n/a	n/a	1.00e+06		n/a

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S00M000441		N-Nitrosodimethylamine	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	7.56e+05	n/a
S00M000441		Di-n-octylphthalate	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	5.67e+05	n/a
S00M000441		Hexachloroethane	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	1.14e+06	n/a
S00M000441		Naphthalene	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	1.00e+06	n/a
S00M000441		Tri-n-butylphosphate	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	2.62e+05	n/a
S00M000441		Total Methylphenols	ug/Kg	n/a	ND	ND	ND	n/a	n/a	n/a	1.18e+06	n/a
S00M000441		Biphenyl	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	2.39e+04	n/a
S00M000441		Diphenylamine	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	2.39e+04	n/a
S00M000441		Nitrobenzene	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	n/a	n/a
S00M000441		Pyridine	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	n/a	n/a
S00M000441		Hexachlorobutadiene	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	n/a	n/a
S00M000441		2,4,5-Trichlorophenol	ug/Kg	n/a	n/a	ND	n/a	n/a	n/a	n/a	n/a	n/a

Drainpipe Sludge: Drainpipe Sludge

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S00M000386		Mercury by CVAA (PE) with FIAS	ug/g	105.8	<6.0e-5	12.24	16.23	14.23	28.0	102.6	3.00e-02	n/a
S00M000386		pH on Solid Samples	pH	n/a	n/a	7.120	7.140	7.130	0.28	n/a	1.00e-02	n/a

Water Leach: Water Leach

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S00M000387	W	Fluoride IC SW846	ug/g	97.97	0.0600	< 2.598	<2.60	n/a	n/a	103.1	2.598	n/a
S00M000387	W	Chloride SW-846	ug/g	96.59	0.0700	49.79	60.70	55.25	19.7	104.7	3.680	n/a
S00M000387	W	Nitrite IC SW846	ug/g	94.98	<0.108	1.15e+02	93.30	104.0	20.6	94.59	23.38	n/a
S00M000387	W	Nitrate by IC SW846	ug/g	95.42	<0.139	88.76	108.0	98.38	19.6	110.7	30.09	n/a
S00M000387	W	Phosphate by IC SW846	ug/g	94.76	<0.120	< 25.98	<26.0	n/a	n/a	79.84	25.98	n/a
S00M000387	W	Sulfate by IC SW846	ug/g	94.56	<0.138	1.23e+02	95.40	109.4	25.6	98.97	29.88	n/a

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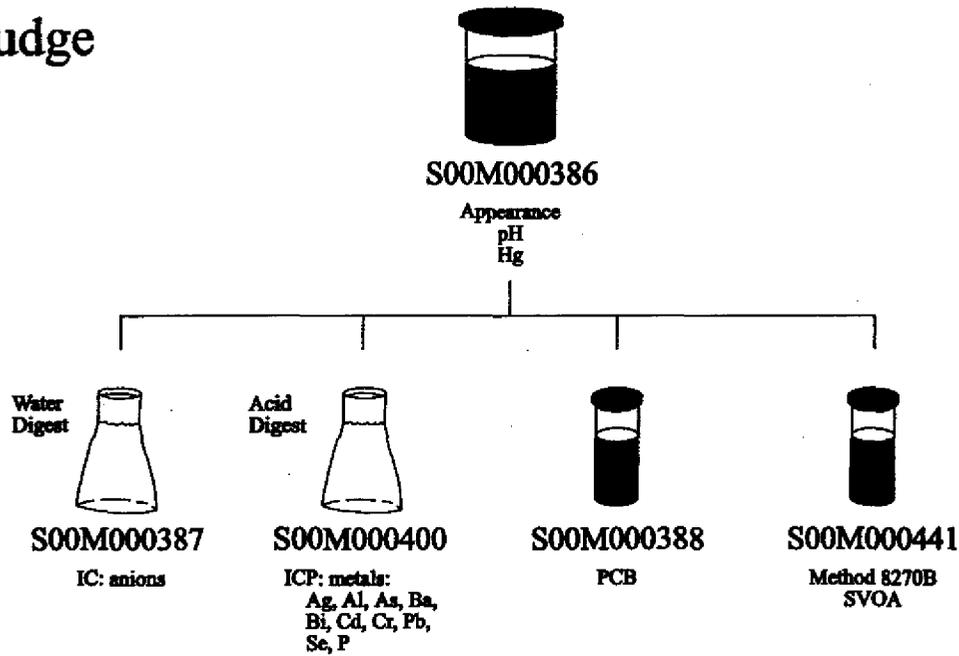
ATTACHMENT 3

SAMPLE BREAKDOWN DIAGRAM

Consisting of 2 pages,
Including cover page

221-U Facility Samples SDG1

Drainpipe Sludge
B10331



FH-0100700

ATTACHMENT 4

**CHAIN OF CUSTODY (COC) AND
REQUEST FOR SAMPLE ANALYSIS FORMS**

Consisting of 3 pages,
Including cover page

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B00-072-01	Page 2 of 2
Collector Fahlberg	Company Contact D Jacques	Telephone No. 373-5299	Project Coordinator TRENT, SJ	Price Code 9N	Data Turnaround 45 Days		
Project Designation 221-U 24-inch Drain Pipe Sampling - Sludge	Sampling Location 221 U	SAF No. B00-072	Air Quality <input type="checkbox"/>				
Ice Chest No.	Field Logbook No. EL 1517	COA B200CS6100	Method of Shipment Hand Delivered				
Shipped To 222-S Lab Operations	Offsite Property No.	Bill of Lading/Air Bill No.					
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None				
	Type of Container	aG	a G				
	No. of Container(s)	1	1				
	Special Handling and/or Storage	Volume	120mL	250ml			
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See # 2				
500m 000386							
Sample No.	Matrix *	Sample Date	Sample Time				
B10331	other solid	8.23.00	1816	X			
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS			Matrix *
Relinquished By		Sign/Print Names		** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.			S=Soil SE=Sediment SO=Solid S = Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wl=Wipe L=Liquid V=Vegetation X=Other
Date/Time		Date/Time		(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Neptunium-237; Americium-241; Strontium-89,90 - Sr-90; ICP Metals - 6010A (SW-846); ICP			
Received By		Date/Time		2) ICP metals 6010A (SW-846), and Add on Bismuth, Mercury 7471, IC anions 300.0, pH soil - 9045			
Date/Time		Date/Time					
Date/Time		Date/Time					
Date/Time		Date/Time					
LABORATORY SECTION	Received By	Title			Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By			Date/Time		

REQUEST FOR SAMPLE ANALYSIS (RSA)

Group ID No. (For lab use only)

20000330

1. Sample Origin 221-U Canyon Building	2. Date Sampled 8-23-00	4. Requestor's Name Steve Trent	6. CACN/COA 113409	7. Cost Center B20056100
3. Customer/Project Code BHZ/221-U CDI		3. Submitted By Doug Bowers		5. Requestor's Phone/MSIN/FAX 372-9651/49-03/372-9487

3. Customer ID No.	9. Laboratory Sample No.	10. Volume of Sample	11. Matrix of Sample	12. Requested Analyses	13. Expected Range
310331 310352 8-20-00	500-100-386	50g	0.75% solid	see chain of custody	

14. Does sample have a MSDS?

Yes HEHF assigned MSDS No. _____

No Description of process that produced waste/sample:
sludge in pipeline.

Will radiochemistry results be used for unconditional release? Yes No

15. Is this sample RCRA listed? Yes No

Applicable Listed Waste Codes:

Yes No P Codes: (list) _____

Yes No U Codes: (list) _____

Yes No K Codes: (list) _____

Yes No F Codes: (list) _____

Applicable Characteristic Codes:

Yes No D001: (how determined) _____ Ignitable

Yes No D002: (how determined) _____ Corrosive

Yes No D003: (how determined) _____ Reactive

Yes No Toxic: (list codes) _____

PCB: Does this waste/sample contain PCBs?

Yes Over 500 ppm

Yes Over 50 ppm

Yes PCBs are suspected

No PCBs are suspected

If YES, what is the source of the PCBs?

Transformer, capacitor, or ballast

Other, specify _____

Unknown

16. Sample Disposition

Return to Customer

Samples found to contain PCBs will be returned to the customer

Dispose of per facility procedures with applied charges for analyses and disposal

Sample(s) Dose Rate at Contact: **80 uRem/hr**

HPT Signature: *[Signature]*

17. QC Required Per 222-S Laboratory Quality Assurance Plan (HNF-SD-CP-QAPP-016)

Other (list reference document or attach) **See Analytical Instructions for 221-U CDI**

18. Special Instructions (Special Storage Requirements, Reporting format, holding times, etc.)

Laboratory is to prioritize PCB analyses so that waste management issues at the lab can be evaluated (disposal of analytical waste)

19. Requested Turnaround Time

2 Weeks 4 Weeks

Other **See Analytical Instructions for 221-U CDI**

20. Sample Received By: **RLC [Signature]** **9-20-00** **1500**

Date Time

21. Chain of Custody

No Yes

Number: _____