FINAL REPORT
VOLUME 3 OF 3

SEDIMENT AND WATER SAMPLING RESULTS MISSISSIPPI RIVER POOL 15

PHASE III

ALCOA-DAVENPORT FACILITY

VOLUME 3 OF 3

Prepared for
Aluminum Company of America
Davenport Facility
Riverdale, Iowa

Woodward-Clyde

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Franklin, TN 37064

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Engineering & Sciences applied to the earth & its environment

January 29, 1996

Mr. Marshall Sonksen
Aluminum Company of America
4879 State Street
Riverdale, Iowa 52722

RE: Analyses of Archived Sediment Samples from the Phase III Sediment Investigation

Dear Marshall:

An objective of the *Sediment/Soil Investigation Studies Mississippi River Pool 15 Phase III Field Sampling Plan* was to collect information regarding background concentrations of metals in sediments. The approach taken in Phase III was to analyze inorganics in samples collected from the upstream reference area and archive samples from the critical study areas (exceptions to this were mercury and cyanide, which were analyzed from selected locations rather than archived due to sample holding time restrictions). The rationale was that reference area analyses would then be used to assist in interpretation of metals data collected from the outfalls during 1992, with subsequent revision of specific metals as contaminants of potential ecological concern if supported by the reference data. This interpretation, in discussion with EPA, would be used to ascertain whether analyses of archived sediment samples from the critical studies areas is necessary. The metals of interest are:

- aluminum
- chromium
- copper
- iron
- lead
- manganese
- silver
- zinc

A summary of metals data from the reference areas, including Duck Creek, Pigeon Creek and Crow Creek, is presented in Table 1. These are compared on a constituent-specific basis to metals collected from the Outfalls during 1992 (the Phase I sediment investigation) in Tables 2 to 9. The values presented in Tables 2 to 9 are for the surface sediment horizon only (0-0.5 ft), since this represents the sediment/water interface and zone of potential biological exposure.

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Field duplicates were averaged. Individual data points and the upper 95% confident limit of the mean (UCL) are presented, with the exception of Outfall 005, for which a limited number of surface sediment samples were collected. Therefore the maximum value is presented for Outfall 005.

There are also additional sediment screening benchmarks with which to evaluate metals concentrations in addition to those used in the *Preliminary Identification of Contaminants of Concern Ecological Risk Assessment Mississippi River Pool 15* (Jacobs Engineering 1994)[1]. The approach used in developing preliminary contaminants of potential ecological concern (COPECs) in sediments by Jacobs was essentially: (1) comparison to typical background concentrations of oven-dried soils; and (2) comparison to published National Oceanic and Atmospheric Administration (NOAA) benchmarks (effects range low [ER-L] and effects range medium [ER-M]). The EPA Superfund program has initiated a project to develop screening benchmark values for soil, water and sediments[2]. These screening benchmarks are referred to as Ecological Thresholds (ETs). Other screening benchmarks are available as well, many of which are summarized in *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1994 Revision* (Hull and Suter 1994)[3]. A summary of the Mississippi River reference area and outfalls and wetlands data is presented in Table 10 with applicable ETs. Where ETs were unavailable, benchmarks recommended by Hull and Suter (1995) are presented. Each of the metals, with associated recommendations for further analysis of archived samples, is discussed in the following sections.

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[1] Jacobs Engineering Group Inc. 1994. Preliminary identification of contaminants of concern ecological risk assessment Mississippi River Pool 15 RE/FS Oversight Riverdale, Iowa. Prepared for the United States Environmental Protection Agency, Region VII. USEPA Work Assignment No. 71-7PP8.

[2] USEPA. 1995. Ecotox Threshold Software. Prepared by ABB Environmental Services for USEPA. Distributed at Society for Environmental Toxicology and Chemistry, Vancouver, British Columbia, November 1995.

[3] Hull, R.N and G.W. Suter II. 1994. Toxicological benchmarks for screening contaminants of potential concern for effects on sediment-associated biota: 1994 revision. Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-95-R1.

Aluminum

The UCL concentration for aluminum in the reference areas was less than in each of the outfalls and wetlands (Table 2). The reference concentration cited in the *Preliminary Identification of Contaminants of Concern Ecological Risk Assessment Mississippi River Pool 15*, was 71,000 mg/kg. There are no other benchmarks available. The highest UCL concentration for aluminum measured during Phase I was 34,406 mg/kg measured in Outfall 002. This is less than one-half the value referenced in the preliminary screening document. Therefore, additional analyses for aluminum are not proposed. Aluminum should not be considered a COPEC in the outfalls, wetlands or Mississippi River.

Chromium

As with aluminum, the UCL concentration for chromium in the reference areas was less than each of the outfalls and wetlands (Table 3). However, EPA has a sediment screening benchmark for chromium of 150 mg/kg (chromium III) (Table 10). The chromium is believed to be chromium III rather than chromium VI: stable chromium VI anionic compounds strongly oxidize organic matter on contact and yield oxidized organic matter and chromium III (Ecological Analysts [1986][4] in Eisler [1986][5]). Total organic carbon in Mississippi River sediments adjacent to the Alcoa facility averaged 1.48% in surface sediments in Area 1 in the Phase III investigation. Therefore, additional analyses for chromium are not proposed. Based on the EPA benchmark, chromium should not be considered a COPEC in the outfalls, wetlands or Mississippi River.

Copper

The UCL concentration for copper in the reference areas was less than in each of the outfalls and wetlands (Table 4). Concentrations in the outfalls and wetlands also exceeded the EPA

[4] Ecological Analysts, Inc. 1981. The sources, chemistry, fate, and effects of chromium in aquatic environments. Avail. from American Petroleum Institute, 2101 L St., N.W., Washington, DC 20037. 207 pp.

[5] Eisler,R. 1986. Chromium hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Reviews Report No. 6, Biological Report 85(1.6). U.S. Fish and Wildlife Service, Laurel, MD.

screening benchmark of 34 mg/kg (Table 10). It is recommended that a limited number of archived samples collected downstream from each outfall be analyzed for copper.

Iron

The UCL for iron in the reference areas was less than in each of the outfalls and wetlands (Table 5). Though there is no EPA ET, there is a biological effects-based screening benchmark for iron cited in Hull and Suter (1994) from the Ontario Ministry of Environment[6]: 30,000 mg/kg. With the exception of Outfall 003, the UCL concentration did not exceed 30,000 mg/kg in any of the Outfalls or wetlands. The average concentration of iron in Outfall 003 was elevated, but this was due to a single sample collected about 400 ft from the river. If this sample is not included, the UCL for Outfall 003 (17,291 mg/kg) is below the benchmark. Because the outfalls and wetlands are potential sources or transport pathways of iron to the Mississippi River, concentrations in the river would also be lower (i.e., the concentrations would decrease moving away from the source). It is therefore proposed that iron analyses not be conducted on archived sediment samples from the Mississippi River. Iron should not be a COPEC in the Mississippi River, but would still be a preliminary COPEC for Outfall 003.

Manganese

Concentrations of manganese in sediments were quite variable in the reference areas (Table 6). The UCL for manganese was generally slightly higher in the outfalls (except Outfall 001) and wetlands as compared to the reference areas. The only sediment screening benchmark available for manganese as cited in Hull and Suter (1994) is 460 mg/kg . This was exceeded in the reference area as well as the outfalls and wetlands. In fact, one of the highest manganese concentrations measured was from a Pigeon Creek sample (834 mg/kg -- Table 1). The highest UCL manganese concentration was in wetland #2, and was only a factor of 1.5 above the Mississippi River reference area UCL. The reference concentration for manganese cited by Jacobs in the preliminary screening document was 850 mg/kg. Because the UCL concentration of manganese in the outfalls and wetlands

[6] Persaud, D., R. Jaagumagi, and A. Hayton. 1990. The Provincial Sediment Quality Guidelines. Ontario Ministry of the Environment

was only slightly above the UCL concentration in the Mississippi River reference area (a maximum factor of 1.5), and the UCL concentration in the outfalls, wetlands and reference areas was less than 850 mg/kg cited as a reference concentration in Jacobs (1994), additional analyses for manganese are not proposed. Manganese should not be considered a COPEC in the outfalls, wetlands or Mississippi River.

Lead

The UCL concentration for lead was less in the reference areas than in each of the outfalls and wetlands (Table 7). EPA has a sediment screening benchmark (ET) for lead of 47 mg/kg (Table 10). The EPA benchmark was slightly exceeded in Outfalls 002, 004 and 006 (51.1 mg/kg, 52.4 mg/kg and 50.6 mg/kg, respectively). This represents a maximum factor of only 1.1 above the EPA benchmark. The UCL for Outfall 001 was very high, but this was due to a single localized sample collected in the Outfall 001 pond at the most distal point from the river -- a distance of over 3,000 ft. If this sample is not included, the UCL for lead in Outfall 001 (36.2 mg/kg) is below EPA's screening benchmark. As noted for iron, because the outfalls and wetlands are potential sources or transport pathways of lead to the Mississippi River, concentrations of lead in the river would be lower. It is therefore proposed that lead analyses not be conducted on archived sediment samples from the Mississippi River. Lead should not be a COPEC in the Mississippi River, but would still be a preliminary COPEC for Outfall 001, which will be evaluated as part of the FSA unit assessments.

Silver

Silver is an interesting constituent in that there were only 2 unqualified detections in all of the outfalls and wetlands in 1992 during the Phase I sediment investigation. One of these detections was from Outfall 003, as shown in Table 8. The other was a lower horizon sample collected from Outfall 002 (4.9 mg/kg -- not shown in Table 8). The only real comparison that can be made between the reference area and the outfalls and wetlands is that the analytical detection limit was about two to three times lower in the reference area. The screening benchmark for silver is 1 mg/kg (Table 10 -- this is a NOAA ER-L and was also used by Jacobs in the screening process). The UCL concentration (based entirely on

one-half the detection limit) was about the same as, or lower than, the screening benchmark in Outfall 004, 005, 006 and the wetlands. Outfalls 001 and 002 are slightly higher (factors of 1.6 and 1.4 above the benchmark, respectively), but are influenced by values qualified as having associated blank contamination. If these concentrations are assumed to be correct, concentrations in the river would likely be less than 1 mg/kg due to attenuation of concentration moving away from the outfalls as potential sources or pathways. Because Outfall 003 was the only Outfall to have a confirmed hit of silver in the surface sediment, we recommend analyzing a limited number of archived samples downstream from Outfall 003 for silver.

Zinc

The UCL for zinc in the reference areas was less than in each of the outfalls and wetlands (Table 9). Concentrations in each outfall (except Outfall 004) also exceeded the EPA sediment screening benchmark of 150 mg/kg (Table 10). The benchmark was not exceeded in the wetlands. It is recommended that archived samples collected downstream from each outfall be analyzed for zinc.

Summary

Based on the results of the reference area metals analyses and comparison of new benchmarks for evaluating sediment contaminants, we propose that:

- archived samples from the Phase III sediment investigation be analyzed for copper and zinc in a limited number of samples downstream from each of the outfalls, and silver downstream from Outfall 003; and
- aluminum, chromium, iron, manganese and lead should not be considered COPECs in the river.

The following sample designations represent three sample locations immediately downstream from each outfall, with the exception of Outfall 003, which has only two locations due to the relatively close proximity to Outfall 002.

Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006
S001A-01D-R00	S014A-01C-R00	S0D3A-01C-R00	S0D4A-01C-R00	S0D7A-01C-R00	S004A-006D-R00
S001B-01D-R00	S014B-01C-R00	S0D3B-01C-R00	S0D4B-01C-R00	S0D7B-01C-R00	S004B-006D-R00
S002A-01D-R00	S0D1A-01C-R00	S013A-01C-R125	S006A-01C-R100	S003A-01C-R00	S002A-01B-R00
S001B-01D-R00	S0D1B-01C-R00		S006B-01C-R100	S003B-01C-R00	S0D1A-01B-R00
S0D1A-01D-R00	S015A-01C-R00		S007A-01C-R25	S004A-01C-R100	
	S015B-01C-R00		S007B-01C-R25	S004B-01C-R100	

Depending on the specific date of collection (sediment samples were collected over a period of about 3 weeks), there is 8 to 11 weeks remaining on the holding time for the archived metals samples. If the additional sample analyses immediately downstream from the outfalls continue to show elevated constituent concentrations, there should still be ample time to request additional analyses if necessary.

Please contact us at 615/790-0003 if you have any question or need additional information.

Sincerely,

Carl M. Crane
Project Manager

Todd D. Hunt
Project Scientist

cc: Kirk Gribben, Alcoa Technical Center, Pittsburgh, PA
Alice Waldhauer, Geraghty & Miller, Dublin, OH
Van Conner, Woodward-Clyde Consultants, Franklin, TN

TABLE 1
SUMMARY OF METALS ANALYSES IN SEDIMENTS FROM REFERENCE AREAS
PHASE III SEDIMENT INVESTIGATION

SAMPLE IDENTIFICATION	Aluminum (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Manganese (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Silver (mg/kg)
S004B-0R-R00	6,090	11.4	7.9	10,300	266	10.5	34.6	< 0.69
S001A-0R-R00	6,290	11.8	8.5	11,100	540	10.7	47.7	< 0.84
S004A-0R-R00	8,900	15.0	10.0	12,600	477	8.2	49.4	< 0.74
S01DA-0R-R00	5,420	17.2	10.1	11,600	393	13.1	45.6	< 0.80
S007A-0R-R100	1,860	5.2	2.8	5,460	273	3.8	15.9	< 0.64
S006A-0R-R125	4,420	9.0	6.0	9,350	499	6.9	32.2	< 0.83
S003A-0R-R25	5,800	11.5	8.6	7,760	213	6.1	34.4	< 0.68
S005A-0R-R75	8,030	14.8	11.9	13,400	423	9.6	41.1	< 0.79
S01A-DCK-R00	1,260	6.1	2.3	4,230	215	3.6	12.2	< 0.59
S001A-Crow Creek*	9,660	14.4	11.7	13,600	462	11.6	45.1	< 0.77
S001B-Crow Creek*	10,900	15.6	11.6	13,900	413	12.1	48.1	< 0.77
S001B-Crow Creek Dup*	10,900	15.7	12.1	14,300	450	14.4	49.3	< 0.76
S001A-Pigeon Creek*	9,000	13.9	13.4	14,800	834	11.9	53.7	< 0.87
S001B-Pigeon Creek*	8,050	12.5	12.1	13,900	660	12.6	48.2	< 0.82
S001B-Pigeon Creek Dup*	7,770	12.2	10.8	12,900	605	11.1	41.3	< 0.76

* Data validation incomplete for these samples

TABLE 2
SUMMARY OF ALUMINUM ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	6,290	5,540	22,400	11,950	14,350	9,540	10,505	36,600	18,300
2	8,900	10,500	22,800	12,200	20,100	25,300	16,000	11,400	17,100
3	5,420	11,400	24,400	39,600	17,000		11,600	17,000	14,200
4	1,860	9,090	9,020	16,500	17,900		24,200	32,300	15,000
5	4,420	12,600	52,300	12,500	17,200		25,100	10,890	15,200
6	5,800	5,720	11,600					6,710	16,900
7	8,030	9,500						21,800	
8	9,660	4,420						11,200	
9	9,000	5,410						23,700	
10	1,260	8,860						17,500	
11		6,330							
12		7,660							
13		6,200							
14		7,750							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	6,064	7,927	23,753	18,550	17,310	17,420	17,481	18,910	16,117
Min	1,260	4,420	9,020	11,950	14,350	9,540	10,505	6,710	14,200
Max	9,660	12,600	52,300	39,600	20,100	25,300	25,100	36,600	18,300
Standard Dev.	2,934	2,482	15,381	11,914	2,062	NC	6,867	9,765	1,556
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	7,765	9,102	36,406	29,909	19,276	NC	24,028	24,570	17,397

NC -Not calculated due to insufficient data.

TABLE 3
SUMMARY OF CHROMIUM ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	11.80	12.60	57.20	19.40	19.20	13.60	24.30	37.70	54.40
2	15.00	25.80	52.10	22.30	24.30	40.90	30.10	16.00	38.20
3	17.20	28.30	47.30	62.50	20.60		21.70	22.30	37.90
4	5.23	21.80	12.30	56.60	26.00		45.20	31.70	44.20
5	9.02	31.10	92.80	28.30	20.80		38.70	19.55	44.10
6	11.50	15.30	26.50					13.50	33.20
7	14.80	27.10						26.50	
8	14.40	14.60						16.20	
9	13.90	12.30						30.50	
10	6.10	17.70						22.50	
11		13.60							
12		14.10							
13		12.90							
14		28.20							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	11.9	19.7	48.0	37.8	22.2	27.3	32.0	23.6	42.0
Min	5.2	12.3	12.3	19.4	19.2	13.6	21.7	13.5	33.2
Max	17.2	31.1	92.8	62.5	26.0	40.9	45.2	37.7	54.4
Standard Dev.	4.0	7.0	27.7	20.2	2.8	NC	9.9	7.8	7.4
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	14.2	23.0	70.8	57.1	24.9	NC	41.4	28.2	48.1

NC -Not calculated due to insufficient data.

TABLE 4
SUMMARY OF COPPER ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	8.46	30.5	176	32.4	78.85	49.7	49.4	69.5	27.8
2	10.00	46.5	209	77.2	111	281	317	28	24.6
3	10.10	63.5	176.5	368	152		34.9	35.5	43.6
4	2.75	34.7	57.7	354	183		135	55.1	35.5
5	6.02	63.2	140	2150	29.3		179	13.4	40.7
6	8.59	29.3	76.5					14.4	26.6
7	11.90	49.2						21.3	
8	11.70	19.3						63.7	
9	13.40	24.6						50.2	
10	2.30	17.3						44.4	
11		14							
12		14.4							
13		12.6							
14		127							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	8.5	39.0	139.3	596.3	110.8	165.4	143.1	39.6	33.1
Min	2.3	12.6	57.7	32.4	29.3	49.7	34.9	13.4	24.6
Max	13.4	127.0	209.0	2,150.0	183.0	281.0	317.0	69.5	43.6
Standard Dev.	3.8	30.7	60.3	882.1	60.4	NC	114.1	20.2	8.0
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	10.7	53.5	188.9	1,437.3	168.4	NC	251.8	51.2	39.7

NC -Not calculated due to insufficient data.

TABLE 5
SUMMARY OF IRON ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation								
		Outfall 001	Outfall 002	Outfall 003	Outfall 003[2]	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	11100	11800	24000	16250	16250	16000	9300	26600	23800	27900
2	12600	17400	19600	15000	15000	14500	17000	16200	12400	20700
3	11600	17900	21150	213000		15200		18500	15600	19300
4	5460	14700	10300	15000	15000	21700		16500	22400	21100
5	9350	19800	6440	10100	10100	15400		19400	16750	21100
6	7760	9060	14100						13000	25000
7	13400	17500							20400	
8	13600	8670							13500	
9	14800	12100							18200	
10	4230	26700							15400	
11		9540								
12		13800								
13		13100								
14		9670								
STATISTIC										
Number	10	14	6	5	4	5	2	5	10	6
Mean	10,390	14,410	15,932	53,870	14,088	16,560	13,150	19,440	17,145	22,517
Min	4,230	8,670	6,440	10,100	10,100	14,500	9,300	16,200	12,400	19,300
Max	14,800	26,700	24,000	213,000	16,250	21,700	17,000	26,600	23,800	27,900
Standard Dev.	3,589	5,060	6,796	88,988	2,723	2,923	NC	4,222	3,975	3,250
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.353	2.132	NC	2.132	1.833	2.015
UCL	12,470	16,805	21,523	138,710	17,291	19,347	NC	23,465	19,449	25,190

NC -Not calculated due to insufficient data.

TABLE 6
SUMMARY OF MANGANESE ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER[1]	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	540	667	670	905	511.5	194	401.5	431	755
2	477	331	445	302	489	595	416	324	607
3	393	346	419	714	682		534	362	444
4	273	458	315	223	394		697	847	635
5	499	407	382	185	620		637	826	599
6	213	178	480					762	952
7	423	357						888	
8	462	254						564	
9	834	260						721	
10	215	463						792	
11		83.7							
12		323							
13		301							
14		200							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	433	331	452	466	539	395	537	652	665
Min	213	84	315	185	394	194	402	324	444
Max	834	667	670	905	682	595	697	888	952
Standard Dev.	183	143	121	324	113	NC	131	213	172
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	539	398	551	774	647	NC	662	775	807

NC -Not calculated due to insufficient data.

TABLE 7
SUMMARY OF LEAD ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation								
		Outfall 001	Outfall 001[1]	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	10.7	11.8	11.8	45.6	19.1	16.65	15.1	15.2	35.7	26.8
2	8.2	36.7	36.7	51.6	15.4	64	53.2	28.8	17.1	27.3
3	13.1	31.2	31.2	58.6	24.8	14.6		19.5	20.5	28
4	3.8	31.6	31.6	12.3	24.6	22.3		36.1	29	36.2
5	6.9	51.7	51.7	25.8	40.7	43.7		63.1	15.25	40.7
6	6.1	33.7	33.7	18.8					13.6	22.3
7	9.6	68	68						18.8	
8	11.6	28.3	28.3						16.1	
9	11.9	18.3	18.3						23.2	
10	3.60	13.6	13.6						21.3	
11		10	10							
12		10.3	10.3							
13		12.6	12.6							
14		5520								
STATISTIC										
Number	10.0	14.0	13.0	6.0	5.0	5.0	2.0	5.0	10.0	6.0
Mean	8.5	419.8	27.5	35.5	24.9	32.3	34.2	32.5	21.1	30.2
Min	3.6	10.0	10.0	12.3	15.4	14.6	15.1	15.2	13.6	22.3
Max	13.1	5,520.0	68.0	58.6	40.7	64.0	53.2	63.1	35.7	40.7
Standard Dev.	3.4	1,468.0	17.6	19.0	9.7	21.2	NC	18.9	6.8	6.8
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	1.782	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	10.5	1,114.7	36.2	51.1	34.1	52.4	NC	50.6	25.0	35.8

NC -Not calculated due to insufficient data.

TABLE 8
SUMMARY OF SILVER ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	*0.42*	*1.10*	*1.35*	*1.10*	*0.75*	*0.75*	*0.65*	*1.00*	*0.70*
2	*0.37*	1.80	*0.95*	3.20	*0.75*	*0.90*	*0.70*	*0.75*	*0.60*
3	*0.40*	1.90	*0.85*	*0.75*	*1.10*		*0.65*	*0.85*	*0.70*
4	*0.32*	1.80	*0.60*	*0.90*	*0.70*		*1.45*	*0.90*	*0.60*
5	*0.41*	2.90	*0.50*	*0.70*	*1.10*		*0.90*	*0.75*	*0.60*
6	*0.34*	1.40	1.70					*0.80*	*0.65*
7	*0.39*	*0.80*						*0.70*	
8	*0.39*	*0.65*						*0.70*	
9	*0.44*	*0.65*						*0.80*	
10	*0.30*	*0.70*						*0.85*	
11		1.50							
12		*0.65*							
13		*0.65*							
14		*0.70*							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	0.38	1.23	0.99	1.33	0.88	0.83	0.87	0.81	0.64
Min	0.30	0.65	0.50	0.70	0.70	0.75	0.65	0.70	0.60
Max	0.44	2.90	1.70	3.20	1.10	0.90	1.45	1.00	0.70
Standard Dev.	0.05	0.68	0.46	1.06	0.20	NC	0.34	0.09	0.05
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	0.40	1.55	1.37	2.34	1.07	NC	1.19	0.86	0.68

NC -Not calculated due to insufficient data.
Values in italics represent reported nondetects -- a value of one-half the detection limit is used.
Underlined values represent samples where silver was also detected in the associated blank.

TABLE 9
SUMMARY OF ZINC ANALYSES IN SEDIMENTS
(All units in mg/kg)

NUMBER	MISSISSIPPI RIVER Reference Area Phase III Investigation	Outfall and Wetland Data from Phase I Investigation							
		Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
1	47.7	106	250	78.1	75.75	94.5	161.5	163	124
2	49.4	239	282	90	66.7	405	255	73	92
3	45.6	293	241	263	74.4		89.3	96.3	117
4	15.9	156	72.2	146	123		167	112	112
5	32.2	411	109	140	65.5		208	66.3	133
6	34.4	151	147					56.5	94.7
7	41.1	322						85	
8	45.1	110						65.4	
9	53.7	418						113	
10	12.2	106						84.3	
11		42.5							
12		36.7							
13		34.6							
14		210							
STATISTIC									
Number	10	14	6	5	5	2	5	10	6
Mean	37.7	188.3	183.5	143.4	81.1	249.8	176.2	91.5	112.1
Min	12.2	34.6	72.2	78.1	65.5	94.5	89.3	56.5	92.0
Max	53.7	418.0	282.0	263.0	123.0	405.0	255.0	163.0	133.0
Standard Dev.	14.1	131.3	85.7	73.2	23.9	NC	61.4	31.6	16.2
$t_{1-\alpha,n-1}$ (α=0.05)	1.833	1.771	2.015	2.132	2.132	NC	2.132	1.833	2.015
UCL	45.9	250.4	254.0	213.2	103.8	NC	234.7	109.8	125.4

NC -Not calculated due to insufficient data.

TABLE 10
SUMMARY OF METALS ANALYSES IN SEDIMENTS
(mg/kg)

Constituent	ECOTOX	Other Benchmarks	Phase III Mississippi River	Outfall and Wetland Data from Phase I Investigation - Mean Concentrations							
				Outfall 001	Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006	Wetland 1	Wetland 2
			(UCL)	(UCL)	(UCL)	(UCL)	(UCL)	(max)	(UCL)	(UCL)	(UCL)
Aluminum		71000[1]	7765	9,102	36,406	29,909	19,276	25,300	24,028	24,570	17,397
Chromium	81		14.2	23.0	70.8	57.1	24.9	40.9	41.4	28.2	48.1
Copper	34		10.7	53.5	189	1,437	168	281.0	252	51.2	39.7
Iron		30000[1]	12,470	16,805	21,523	138,710	19,347	17,000	23,465	19,449	25,190
Manganese		460[1],850[2]	539	398	551	774	647	595	662	775	807
Lead	47		10.5	1,115	51.1	34.1	52.4	53.2	50.6	25.0	35.8
Silver		1[1,2]	0.4	1.6	1.4	2.3	1.1	0.9	1.2	0.9	0.7
Zinc	150		45.9	250	254	213	103.8	405	235	109.8	125

[1]Hull, R.N and G.W. Suter II. 1994. Toxicological benchmarks for screening contaminants of potential concern for effects on sediment-associated biota: 1994 revision. Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-95/R1

[2]Jacobs Engineering Group Inc. 1994. Preliminary identification of contaminants of concern ecological risk assessment Mississippi River Pool 15 RE/FS Oversight Riverdale, Iowa. Prepared for the United States Environmental Protection Agency, Region VII.

APPENDIX F

STATISTICAL ANALYSES COMPARING YMA (1990) AND PHASE III DATA

AROCLOR 1248
Phase III vs YMA (1990)

	YMA (1990)	WCC (1996)	YMA (1990)	WCC (1996)	YMA (1990)	WCC (1996)
	SUMMARY STATISTICS					
AREA	1A	1A	1B	1B	1C	1C
count	8	6	13	12	52	21
min	0.17	0.02	0.71	0.03	0.025	0.02
mean	1.31	0.29	11.35	0.10	0.87	0.46
max	2.06	1.2	22.6	0.32	2.64	3.5
st dev	0.70	0.46	7.00	0.10	0.67	0.77
Number	DATA					
1	1.63	0.02	20.26	0.06	1.29	0.14
2	2.04	0.02	0.71	0.11	1.61	0.06
3	1.6	0.06	18.81	0.09	0.93	0.15
4	1.58	0.1	7.5	0.04	1.45	0.27
5	0.54	1.2	16.72	0.32	0.86	0.48
6	0.83	0.34	10.86	0.24	1.8	1.4
7	2.06		13.86	0.04	1.88	0.38
8	0.17		10.68	0.03	0.5	0.51
9			3.82	0.03	2.19	3.5
10			12.96	0.04	0.47	0.23
11			22.6	0.03	0.86	0.02
12			2.59	0.22	0.955	0.04
13			6.14		0.875	0.1
14					0.95	0.38
15					0.95	0.03
16					0.27	0.03
17					0.85	0.36
18					1.6	0.81
19					0.96	0.16
20					2.59	0.13
21					0.9	0.39
22					1.87	
23					0.81	
24					0.68	
25					1.01	
26					0.45	
27					0.29	
28					0.18	
29					0.41	
30					0.35	

AROCLOR 1248
Phase III vs YMA (1990)

	YMA (1990)	WCC (1996)	YMA (1990)	WCC (1996)	YMA (1990)	WCC (1996)
31					1.4	
32					0.67	
33					0.17	
34					0.57	
35					0.025	
36					0.38	
37					0.14	
38					0.49	
39					1.39	
40					0.25	
41					0.66	
42					2.3	
43					0.89	
44					0.17	
45					0.72	
46					2.64	
47					0.76	
48					0.09	
49					0.1	
50					0.1	
51					0.16	
52					0.57	

---------- --T-Tests---------- ----------

Date/Time 06-21-1996 08:06:23
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Two Sample T-Test Results

	LN1A1990		LN1A1996	
Count - Mean	8	3.464895E-02	6	-2.306088
95% C.L. of Mean	-.6867098	.7560077	-4.001581	-.6105962
Std.Dev - Std.Error	.8655374	.3060136	1.619496	.6611565

Ho:Diff=0	----- Equal Variances -----		----- Unequal Variances -----	
T Value - Prob.	3.504194	0.0043	3.21291	0.0124
Degrees of Freedom		12		7.964735
Diff. - Std. Error	2.340737	.6679817	2.340737	.7285412
95% C.L. of Diff.	.8858901	3.795585	.6618362	4.019639

F-ratio testing group variances 3.500968 Prob. Level 0.1597

```
                |-4.001581          95% Conf. Limit Plots          .7560077|
LN1A1990        |                                          <-------a------->|
LN1A1996        |<-------------------a--------------------->                |

                |-4.001581                Line Plots                .7560077|
LN1A1990        |.........................1.............1....1......12.11|
LN1A1996        |.2............1.....1.............1.............1.......|
```

AREA 1A
ln transformed

---------- --T-Tests---------- ----------

Date/Time 06-21-1996 08:06:38
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Two Sample T-Test Results

	LN1B1990		LN1B1996	
Count - Mean	13	2.123159	12	-2.640468
95% C.L. of Mean	1.527683	2.718636	-3.199155	-2.08178
Std.Dev - Std.Error	.9857875	.2734083	.8800622	.254052

Ho:Diff=0	----- Equal Variances -----		----- Unequal Variances -----	
T Value - Prob.	12.7035	0.0000	12.76353	0.0000
Degrees of Freedom		23		24.9645
Diff. - Std. Error	4.763627	.3749854	4.763627	.3732218
95% C.L. of Diff.	3.987988	5.539267	3.994969	5.532285

F-ratio testing group variances 1.2547 Prob. Level 0.7071

```
                |-3.506558          95% Conf. Limit Plots          3.11795|
LN1B1990                                                  <----a----->   |
LN1B1996        |   <---a---->                                            |

                |-3.506558                Line Plots                3.11795|
LN1B1990        |.........................1.........1...1...1.1..2111111|
LN1B1996        |3.3...1..1.1.....11.1.....................................|
```

Area 1B
ln transformed

---------- --T-Tests---------- ----------

Date/Time 06-21-1996 08:06:46
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Two Sample T-Test Results

	LN1C1990		LN1C1996	
Count - Mean	52	-.5028979	21	-1.604871
95% C.L. of Mean	-.7789293	-.2268665	-2.205003	-1.004738
Std.Dev - Std.Error	.9914952	.1374956	1.318487	.2877174

Ho:Diff=0	----- Equal Variances -----		----- Unequal Variances -----	
T Value - Prob.	3.89749	0.0002	3.455728	0.0017
Degrees of Freedom		71		30.4924
Diff. - Std. Error	1.101973	.2827391	1.101973	.318883
95% C.L. of Diff.	.5382091	1.665737	.4507543	1.753191

F-ratio testing group variances 1.768359 Prob. Level 0.1335

```
                |-3.912023          95% Conf. Limit Plots          1.252763|
LN1C1990        |                                          <--a-->          |
LN1C1996        |                              <------a------>              |

                |-3.912023               Line Plots                1.252763|
LN1C1990        |..1.............12..1.13...111.211212.32265..132.3.2.2...|
LN1C1996        |1...2...1...1.....1..211...1.1..31.11....1.....1.........1|
```

Area 1C
Ln transformed

----------Descriptive Statistics----------

Date/Time 06-20-1996 15:52.57
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1A-1990

Mean - Average	1.30625	No. observations	8
Lower 95% c.i.limit	.7188209	No. missing values	0
Upper 95% c.i.limit	1.893679	Sum of frequencies	8
Adj sum of squares	3.477588	Sum of observations	10.45
Standard deviation	.7048392	Std.error of mean	.2491983
Variance	.4967982	T-value for mean=0	5.24181
Coef. of variation	.5395898	T prob level	0.0012
Skewness	-.610227	Kurtosis	-1.149655
Normality Test Value	1.095285	Reject if > 1.548(10%)	2.421(5%)
K.S. Normality Test	0.15113	Reject if > 0.264(10%)	0.288(5%)

«b1 -0.49 Skew-Z -0.82 Pr 0.4113 b2 1.79 Kurt-Z -0.77 Pr 0.4384
D'Agostino-Pearson Omnibus K» Normality Test 1.3 Pr 0.5285

100-%tile (Maximum)	2.06	90-%tile	2.05
75-%tile	1.835	10-%tile	.17
50-%tile (Median)	1.59	Range	1.89
25-%tile	.685	75th-25th %tile	1.15
0-%tile (Minimum)	.17	C.L. Median(95%)	.17, 2.06

.17----------Line Plot / Box Plot----------2.06
1 1 1 111 11

Distribution & Histogram

able: 1A-1990

	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.17	.44	1	12.5	1	12.5	:*
2	.44	.71	1	12.5	2	25.0	:*
3	.71	.9800001	1	12.5	3	37.5	:*
4	.9800001	1.25	0	0.0	3	37.5	:
5	1.25	1.52	0	0.0	3	37.5	:
6	1.52	1.79	3	37.5	6	75.0	:***
7	1.79	2.06	2	25.0	8	100.0	:**

	Untransformed Data
1	0.1700
2	0.5400
3	0.8300
4	1.5800
5	1.6000
6	1.6300
7	2.0400
8	2.0600

D: 3.4776 W: 0.8897

The population has a normal distribution.
The W value, 0.8897 is greater than the 0.10 quantile level of 0.8510 for 8 samples.

Transformed Data - LN(x)	
1	-1.7720
2	-0.6162
3	-0.1863
4	0.4574
5	0.4700
6	0.4886
7	0.7129
8	0.7227

D: 5.2441 W: 0.8003

The population has a lognormal distribution. [LN(x)]
The W value, 0.8003 is greater than the 0.02
quantile level of 0.7780 for 8 samples.

Transformed Data - LN(x+1)

1	0.1570
2	0.4318
3	0.6043
4	0.9478
5	0.9555
6	0.9670
7	1.1119
8	1.1184

D: 0.8585 W: 0.8629

The population has a lognormal distribution. [LN(x+1)]
The W value, 0.8629 is greater than the 0.10
quantile level of 0.8510 for 8 samples.

----------Descriptive Statistics----------

Date/Time 06-20-1996 15:52:57
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1A-1996

Mean - Average	.29	No. observations	6
Lower 95% c.i.limit	-.1932671	No. missing values	0
Upper 95% c.i.limit	.7732672	Sum of frequencies	6
Adj sum of squares	1.0654	Sum of observations	1.74
Standard deviation	.4616059	Std.error of mean	.1884498
Variance	.21308	T-value for mean=0	1.538871
Coef. of variation	1.591744	T prob level	0.1845
Skewness	2.120713	Kurtosis	4.549716
Normality Test Value	19.61658	Reject if > 1.764(10%)	3.510(5%)
K.S. Normality Test	0.32635	Reject if > 0.297(10%)	0.323(5%)

«b1 1.55 Skew-Z 0.00 Pr 1.0000 b2 3.70 Kurt-Z 0.00 Pr 1.0000

D'Agostino-Pearson Omnibus K» Normality Test 0.0 Pr 1.0000

100-%tile (Maximum)	1.2	90-%tile	1.2
75-%tile	.34	10-%tile	.02
50-%tile (Median)	.08	Range	1.18
25-%tile	.02	75th-25th %tile	.32
0-%tile (Minimum)	.02	C.L. Median(95%)	.02, 1.2

.02----------Line Plot / Box Plot----------1.2
2 1 1 1 1

Distribution & Histogram

ble: 1A-1996

B.	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.02	.2166667	4	66.7	4	66.7	:****
2	.2166667	.4133334	1	16.7	5	83.3	:*
3	.4133334	.61	0	0.0	5	83.3	:
4	.61	.8066667	0	0.0	5	83.3	:
5	.8066667	1.003333	0	0.0	5	83.3	:
6	1.003333	1.2	1	16.7	6	100.0	:*

Untransformed Data	
1	0.0200
2	0.0200
3	0.0600
4	0.1000
5	0.3400
6	1.2000

D: 1.0654 W: 0.6816

The data is not normally distributed.

Transformed Data - LN(x)	
1	-3.9120
2	-3.9120
3	-2.8134
4	-2.3026
5	-1.0788
6	0.1823

D: 13.1138 W: 0.9196

The population has a lognormal distribution. [LN(x)]
The W value, 0.9196 is greater than the 0.10
quantile level of 0.8260 for 6 samples.

Transformed Data - LN(x+1)	
1	0.0198
2	0.0198
3	0.0583
4	0.0953
5	0.2927
6	0.7885

D: 0.4499 W: 0.7326

The population has a lognormal distribution. [LN(x+1)]
The W value, 0.7326 is greater than the 0.01
quantile level of 0.7130 for 6 samples.

----------Descriptive Statistics----------

Date/Time 06-20-1996 15:52:58
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1B-1990

Mean - Average	11.34692	No. observations	13
Lower 95% c.i.limit	7.116211	No. missing values	0
Upper 95% c.i.limit	15.57764	Sum of frequencies	13
Adj sum of squares	588.6349	Sum of observations	147.51
Standard deviation	7.003778	Std.error of mean	1.942499
Variance	49.05291	T-value for mean=0	5.841406
Coef. of variation	.6172403	T prob level	0.0001
Skewness	6.420578E-02	Kurtosis	-1.109449
Normality Test Value	1.002253	Reject if > 1.329(10%)	1.638(5%)
K.S. Normality Test	0.09320	Reject if > 0.215(10%)	0.235(5%)
«b1 0.06 Skew-Z	0.11 Pr 0.9127	b2 1.85 Kurt-Z	-1.08 Pr 0.2812
D'Agostino-Pearson Omnibus K» Normality Test		1.2	Pr 0.5561
100-%tile (Maximum)	22.6	90-%tile	20.26
75-%tile	16.72	10-%tile	2.59
50-%tile (Median)	10.86	Range	21.89
25-%tile	6.14	75th-25th %tile	10.58
0-%tile (Minimum)	.71	C.L. Median(95%)	3.82, 18.81

.71----------Line Plot / Box Plot----------22.6
1 1 1 1 1 2 1 1 1 1 1 1 1

Distribution & Histogram

able: 1B-1990

Bin	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.71	3.44625	2	15.4	2	15.4	:**
2	3.44625	6.1825	2	15.4	4	30.8	:**
3	6.1825	8.918751	1	7.7	5	38.5	:*
4	8.918751	11.655	2	15.4	7	53.8	:**
5	11.655	14.39125	2	15.4	9	69.2	:**
6	14.39125	17.1275	1	7.7	10	76.9	:*
7	17.1275	19.86375	1	7.7	11	84.6	:*
8	19.86375	22.6	2	15.4	13	100.0	:**

	Untransformed Data
1	0.7100
2	2.5900
3	3.8200
4	6.1400
5	7.5000
6	10.6800
7	10.8600
8	12.9600
9	13.8600
10	16.7200
11	18.8100
12	20.2600
13	22.6000

D: 588.6349 W: 0.9663

The population has a normal distribution.
The W value, 0.9663 is greater than the 0.50 quantile level of 0.9450 for 13 samples.

	Transformed Data - LN(x)
1	-0.3425
2	0.9517
3	1.3403
4	1.8148
5	2.0149
6	2.3684
7	2.3851
8	2.5619
9	2.6290
10	2.8166
11	2.9344
12	3.0086
13	3.1179

D: 11.6613 W: 0.8627

The population has a lognormal distribution. [LN(x)]
The W value, 0.8627 is greater than the 0.02
quantile level of 0.8370 for 13 samples.

Transformed Data - LN(x+1)

1	0.5365
2	1.2782
3	1.5728
4	1.9657
5	2.1401
6	2.4579
7	2.4732
8	2.6362
9	2.6987
10	2.8747
11	2.9862
12	3.0568
13	3.1612

D: 7.2626 W: 0.9060

The population has a lognormal distribution. [LN(x+1)]
The W value, 0.9060 is greater than the 0.10
quantile level of 0.8890 for 13 samples.

----------Des. ptive Statistics----------

Date/Time 06-20-1996 15:52:58
Data Base Name C:\ncss\ymavswcc
D- -ription Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1B-1996

Mean - Average	.1041667	No. observations	12
Lower 95% c.i.limit	4.083079E-02	No. missing values	0
Upper 95% c.i.limit	.1675025	Sum of frequencies	12
Adj sum of squares	.1094917	Sum of observations	1.25
Standard deviation	9.976867E-02	Std.error of mean	2.880074E-02
Variance	9.953788E-03	T-value for mean=0	3.616806
Coef. of variation	.9577792	T prob level	0.0040
Skewness	1.31926	Kurtosis	.4771108
Normality Test Value	11.92063	Reject if > 1.357(10%)	1.719(5%)
K.S. Normality Test	0.25434	Reject if > 0.222(10%)	0.243(5%)

«b1 1.15 Skew-Z 2.04 Pr 0.0417 b2 2.84 Kurt-Z 0.60 Pr 0.5504
D'Agostino-Pearson Omnibus K» Normality Test 4.5 Pr 0.1052

100-%tile (Maximum)	.32	90-%tile	.24
75-%tile	.165	10-%tile	.03
50-%tile (Median)	.05	Range	.29
25-%tile	.035	75th-25th %tile	.13
0-%tile (Minimum)	.03	C.L. Median(95%)	.03, .22

.03----------Line Plot / Box Plot----------.32
3 3 1 1 1 1 1 1

Distribution & Histogram

ble: 1B-1996

b.	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.03	.06625	7	58.3	7	58.3	:*******
2	.06625	.1025	1	8.3	8	66.7	:*
3	.1025	.13875	1	8.3	9	75.0	:*
4	.13875	.175	0	0.0	9	75.0	:
5	.175	.21125	0	0.0	9	75.0	:
6	.21125	.2475	2	16.7	11	91.7	:**
7	.2475	.28375	0	0.0	11	91.7	:
8	.28375	.32	1	8.3	12	100.0	:*

	Untransformed Data
1	0.0300
2	0.0300
3	0.0300
4	0.0400
5	0.0400
6	0.0400
7	0.0600
8	0.0900
9	0.1100
10	0.2200
11	0.2400
12	0.3200

D: 0.1095 W: 0.7655

The data is not normally distributed.

Transformed Data - LN(x)	
1	-3.5066
2	-3.5066
3	-3.5066
4	-3.2189
5	-3.2189
6	-3.2189
7	-2.8134
8	-2.4079
9	-2.2073
10	-1.5141
11	-1.4271
12	-1.1394

D: 8.5196 W: 0.8573

The population has a lognormal distribution. [LN(x)]
The W value, 0.8573 is greater than the 0.02
quantile level of 0.8280 for 12 samples.

Transformed Data - LN(x+1)	
1	0.0296
2	0.0296
3	0.0296
4	0.0392
5	0.0392
6	0.0392
7	0.0583
8	0.0862
9	0.1044
10	0.1989
11	0.2151
12	0.2776

D: 0.0823 W: 0.7750

The data is not lognormally distributed. [LN(x+1)]

----------Descriptive Statistics----------

Date/Time 06-20-1996 15:52:59
Data Base Name C:\ncss\ymavswcc
Description Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1C-1990

Mean - Average	.87375	No. observations	52
Lower 95% c.i.limit	.6879281	No. missing values	0
Upper 95% c.i.limit	1.059572	Sum of frequencies	52
Adj sum of squares	22.72104	Sum of observations	45.435
Standard deviation	.6674659	Std.error of mean	9.256086E-02
Variance	.4455107	T-value for mean=0	9.439735
Coef. of variation	.7639094	T prob level	0.0000
Skewness	1.008836	Kurtosis	.4538704
Normality Test Value	1.10312	Reject if > 1.091(10%)	1.140(5%)
K.S. Normality Test	0.17936	Reject if > 0.112(10%)	0.123(5%)

√b1 0.98 Skew-Z 2.83 Pr 0.0047 b2 3.30 Kurt-Z 0.87 Pr 0.3862

D'Agostino-Pearson Omnibus K² Normality Test 8.8 Pr 0.0125

100-%tile (Maximum)	2.64	90-%tile	1.87
75-%tile	1.15	10-%tile	.15
50-%tile (Median)	.785	Range	2.615
25-%tile	.365	75th-25th %tile	.785
0-%tile (Minimum)	.025	C.L. Median(95%)	.5, .93

.025----------Line Plot / Box Plot----------2.64
1 3131 21 12 22 2 21111 42141 1 2 1 2 1 2 1 1 11

Distribution & Histogram

Variable: 1C-1990

Bin	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.025	.2261539	9	17.3	9	17.3	:*********
2	.2261539	.4273077	6	11.5	15	28.8	:******
3	.4273077	.6284615	6	11.5	21	40.4	:******
4	.6284615	.8296154	6	11.5	27	51.9	:******
5	.8296154	1.030769	12	23.1	39	75.0	:************
6	1.030769	1.231923	0	0.0	39	75.0	:
7	1.231923	1.433077	3	5.8	42	80.8	:***
8	1.433077	1.634231	3	5.8	45	86.5	:***
9	1.634231	1.835385	1	1.9	46	88.5	:*
10	1.835385	2.036539	2	3.8	48	92.3	:**
11	2.036539	2.237692	1	1.9	49	94.2	:*
12	2.237692	2.438846	1	1.9	50	96.2	:*
13	2.438846	2.64	2	3.8	52	100.0	:**

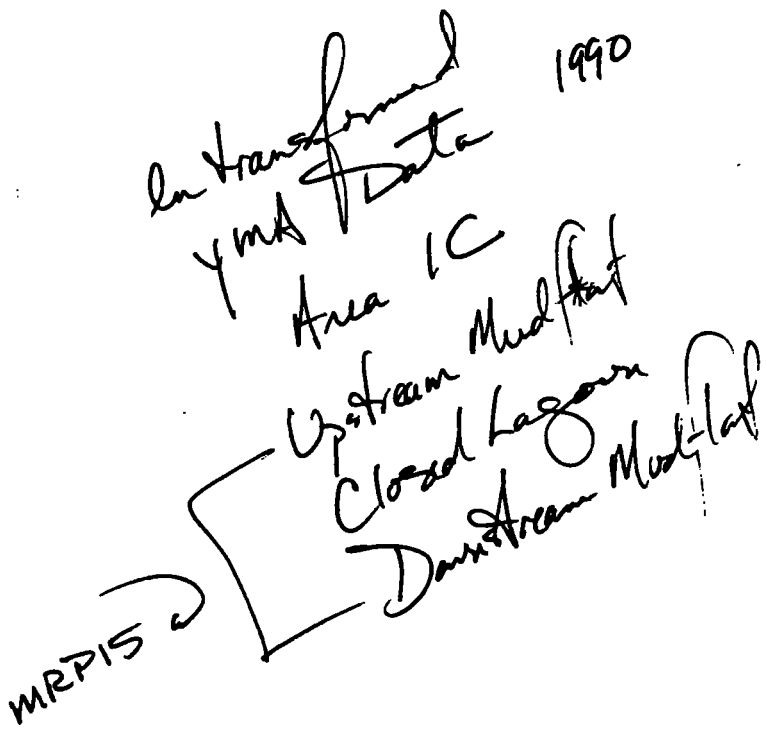
KS One Sample Test (Normal distribution) Report

Data File Name: A:\1C1996.XLS

FOR COLUMNS COLUMN1

KS One Sample (normal distribution) Result:

Max D:	0.51993881
Probability:	4.2512357e-13



----------Descriptive Statistics----------

Date/Time 06-20-1996 15:52:59
D Base Name C:\ncss\ymavswcc
1 iption Data base created at 12:47:59 on 06-11-1996

Detail Report

Variable: 1C-1996

Mean - Average	.4557143	No. observations	21
Lower 95% c.i.limit	.1061866	No. missing values	0
Upper 95% c.i.limit	.8052419	Sum of frequencies	21
Adj sum of squares	11.79371	Sum of observations	9.57
Standard deviation	.7679099	Std.error of mean	.1675717
Variance	.5896857	T-value for mean=0	2.719518
Coef. of variation	1.685069	T prob level	0.0132
Skewness	3.483513	Kurtosis	13.3737
Normality Test Value	12.88314	Reject if > 1.206(10%)	1.337(5%)
K.S. Normality Test	0.32896	Reject if > 0.173(10%)	0.189(5%)

«b1 3.23 Skew-Z 4.82 Pr 0.0000 b2 13.12 Kurt-Z 4.19 Pr 0.0000

D'Agostino-Pearson Omnibus K» Normality Test 40.8 Pr 0.0000

100-%tile (Maximum)	3.5	90-%tile	.81
75-%tile	.39	10-%tile	.03
50-%tile (Median)	.23	Range	3.48
25-%tile	.1	75th-25th %tile	.29
0-%tile (Minimum)	.02	C.L. Median(95%)	.1, .39

.02----------Line Plot / Box Plot----------3.5
4123 11 4 11 1 1 1

Distribution & Histogram

Variable: 1C-1996

Bin	Lower	Upper	Count	Prcnt	Total	Prcnt	Histogram
1	.02	.368	13	61.9	13	61.9	:**********
2	.368	.716	5	23.8	18	85.7	:*****
3	.716	1.064	1	4.8	19	90.5	:*
4	1.064	1.412	1	4.8	20	95.2	:*
5	1.412	1.76	0	0.0	20	95.2	:
6	1.76	2.108	0	0.0	20	95.2	:
7	2.108	2.456	0	0.0	20	95.2	:
8	2.456	2.804	0	0.0	20	95.2	:
9	2.804	3.152	0	0.0	20	95.2	:
10	3.152	3.5	1	4.8	21	100.0	:*

	Untransformed Data
1	0.0200
2	0.0300
3	0.0300
4	0.0380
5	0.0400
6	0.0600
7	0.1000
8	0.1300
9	0.1400
10	0.1500
11	0.1600
12	0.2300
13	0.2700
14	0.3600
15	0.3800
16	0.3900
17	0.4800
18	0.5100
19	0.8100
20	1.4000
21	3.5000

D: 11.9569 W: 0.5370

The data is not normally distributed.

Transformed Data - LN(x)	
1	-3.9120
2	-3.5066
3	-3.5066
4	-3.2702
5	-3.2189
6	-2.8134
7	-2.3026
8	-2.0402
9	-1.9661
10	-1.8971
11	-1.8326
12	-1.4697
13	-1.3093
14	-1.0217
15	-0.9676
16	-0.9416
17	-0.7340
18	-0.6733
19	-0.2107
20	0.3365
21	1.2528

D: 36.8828 W: 0.9725

The population has a lognormal distribution. [LN(x)]
The W value, 0.9725 is greater than the 0.50
quantile level of 0.9600 for 21 samples.

Transformed Data - LN(x+1)	
1	0.0198
2	0.0296
3	0.0296
4	0.0373
5	0.0392
6	0.0583
7	0.0953
8	0.1222
9	0.1310
10	0.1398
11	0.1484
12	0.2070
13	0.2390
14	0.3075
15	0.3221
16	0.3293
17	0.3920
18	0.4121
19	0.5933
20	0.8755
21	1.5041

D: 2.4694 W: 0.7160

The data is not lognormally distributed. [LN(x+1)]

APPENDIX G

FIELD NOTES AND CHAIN-OF-CUSTODY DOCUMENTATION

ALCOA - Davenport
95N0016/0020
Field Studies

1/3

SHAW'S
PIONEERS SINCE 1831

account book S149

Available in 150 and 300 pages

Sampling Log Book

No Units

Record Ruled, 27 Lines

WilsonJones.

ACCO USA, Inc., Wheeling, IL 60090

Made in U.S.A.

Reorder number stamped on backbone of this book

ALCOA - Davenport, OHIO

95N016/020

- Field Studies

94N055/100

- Hydro Work

Field Dates:

Sept. 18, 1995 →

20 Sept 95

Hydrographic Surveying

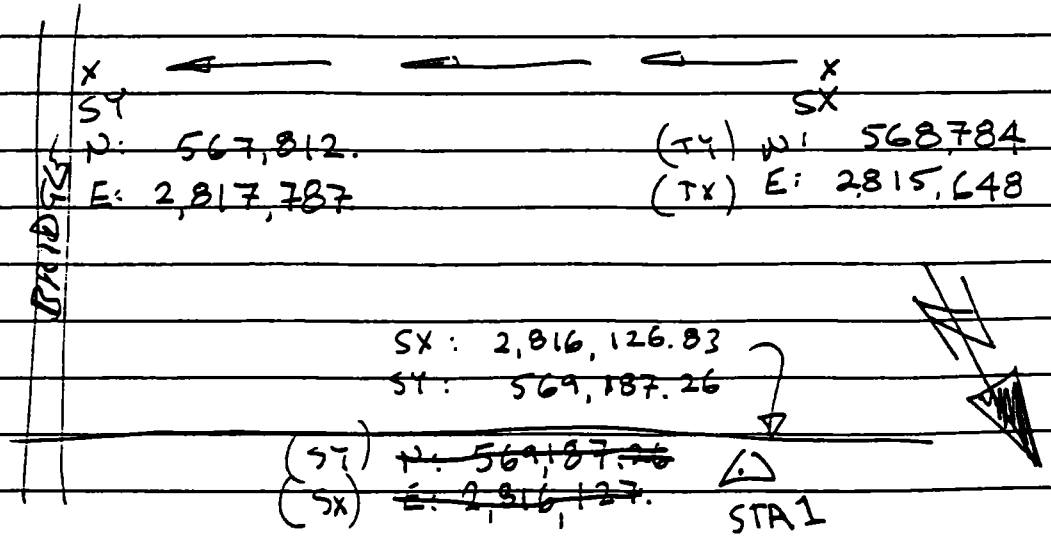
10L ⊡ ① 7L ⊡ ②

N 568,442.39 N 568,677.12
E 2,813,927.77 E 2,809,798.76

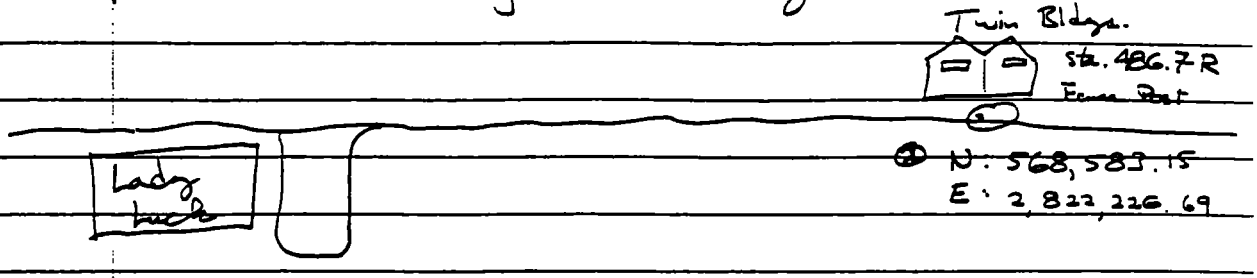
△ ③
STA 1 N 569187.26
E 2,816,126.83

T @ STA 1
BS @ 10L N AZ = 251.1715

Hydro Survey: T @ STA 1, BS @ 10L
N.AZ = 251° 17' 10"

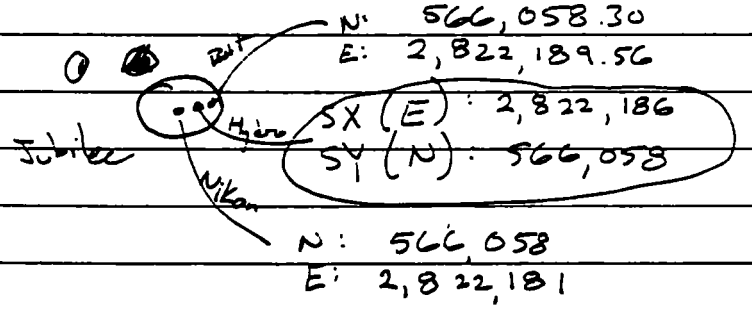


22 Sept. 95 Hydro Survey



TX: (E) 2,818,965
TY: (N) 567,997

(E) SX: 2,822,126
(N) SY: 567,850

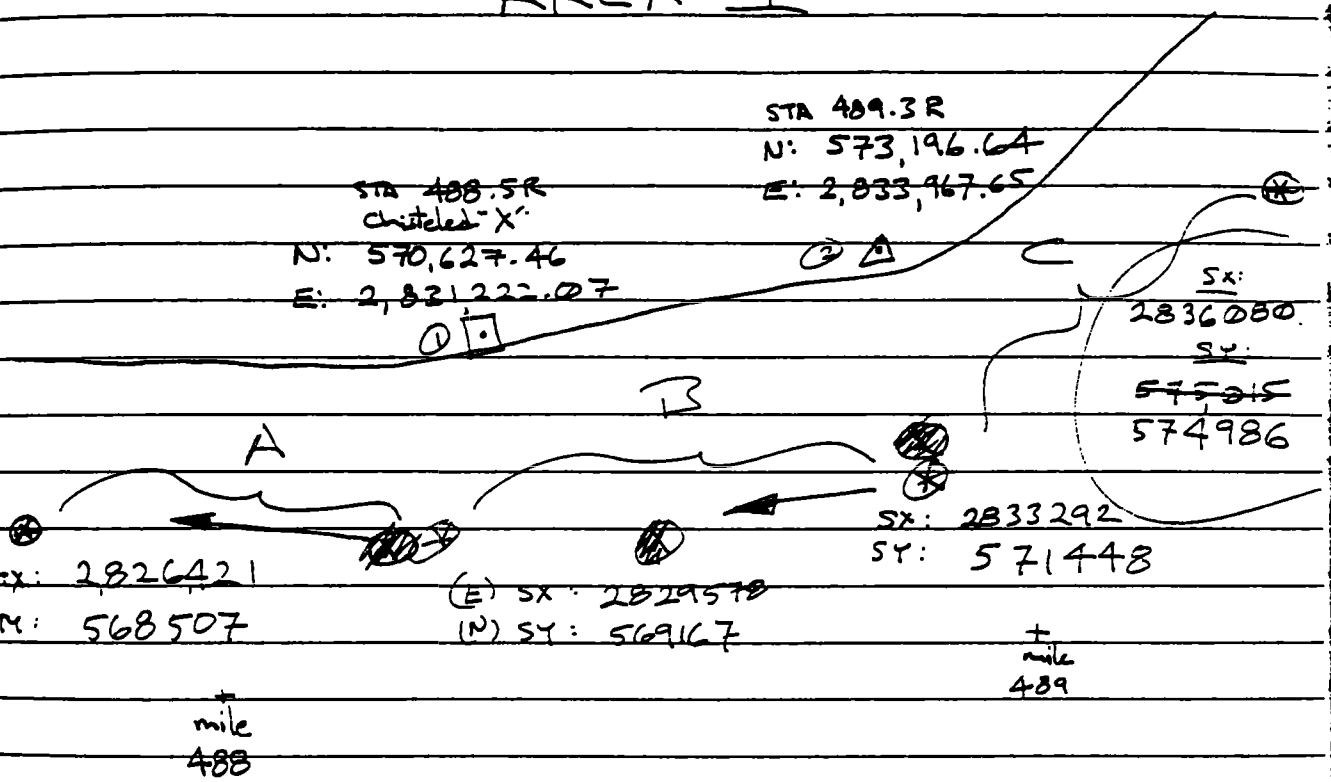


N. Az. Nikon → Twin = 1.0212

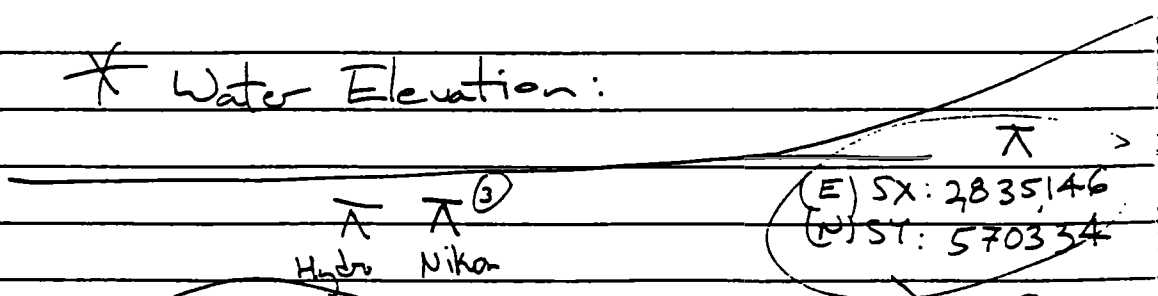
N. Az. Hydro → Twin = 0.5523

23 Sept '95 (Sat.) Hydro Survey

AREA 1



* Water Elevation:



Oct 16, 95

0700 WCC team met for breakfast DLS gave health & safety meeting.

0800 loaded boats and equipment.

0900 launched boats from dock

0915 Set up GPS reference unit. 5 Sats, Trak 5.

0916 Set up rovers. Receiving bad satellite coverage. 5 Sats, tracking 1.

DLS & DB have Rover 2 on the barge

BL & ES have Rover 1 on the fish boat.

1015 Collected GPS Data for Area 7, Transects 1, 2, 3. Code A7T1, A7T2, A7T3

1026 Motored to Area 3.

1030 Collected GPS Data for Area 3, Transects 1-5.

1050 Collected GPS Data for Area 2, Transect 1-9. Code A2T9, A2T8, etc.

Also shot shoreline points for Area 2

1125 Collected GPS Data for Discretionary samples A2DIN - Discretionary near intake

A2D2TANK - " near tanks & loading

1130 Shot Area 1D, Trans 17

" " ", Trans 16 and continued to Duck Creek (Transects 12 - 17 of Area 2D)

1150 Shot Duck creek samples (Sample locations) GPS: DC1, DC2, ~~DC3~~ DC3.

1200 Satellites went down to 4. GPS was not able to work

1207 Retrieved Reference unit.
1215 Docked barge and boat at curtsy dock. Broke for lunch at dock.
1300 Downloaded data from GPS units. DLS, BC, and DB went to the dive shop to pick up the scuba tanks.
1318 Error occured when downloading reference unit. Error read:
"Differential Processor
Error reading file
Unrecognizable format."
Could be due to reference unit being full when went to turn it off.
Power Files OCT16R1 & OCT16R2
Downloading Ref unit: 632 blocks.
SOKKIA - 1-800-255-3913 ext 86 for Tech Support.
Technical Support: 86
Cellular Phone: 615-604-2954
Advance Survey: 615-242-3762
Ray Suduhl... on vacation this week.
Could never get Tech Support from SOKKIA.
1600 Set up at reference again.
shot 1A & 1B.
1800 Loaded up boats.
1830 Unloaded boats at hotel.
1831 closed log book

Oct. 17, 1995 (Tuesday) Weather: Very Windy, Clouds, 50's - 60's

0700 Met for breakfast. Had health & safety meeting.

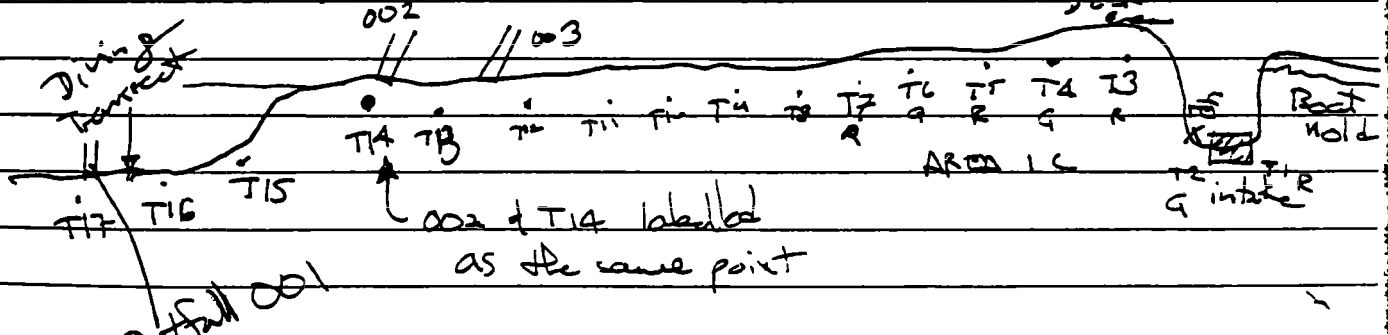
0745 Downloaded data from yesterday.
Loaded boat w/ equipment for the day.

0930 Departed for dock.

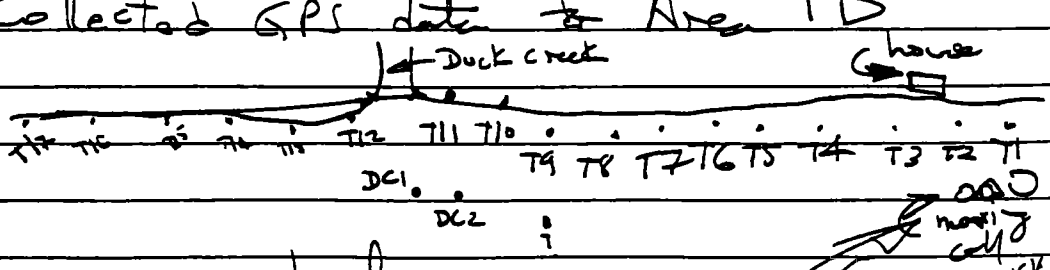
1000 Set up GPS reference unit for data collection. Satellite availability was too poor to collect anything.

1200 Stopped for lunch. Observed satellites until enough were available.

1300 Began GPS collection. Collected Area 1C.
(Note: Need to return to reference unit @ 4:00 (1600))



1415 Collected GPS data for Area 1D



Waves Very high.

NOTE: Transects were difficult to find because many of them were underwater due to the rise in water elevation.

Oct. 17, 95 (cont.)

1520 Diving transect at ID-T12 (Duck Creek) labeled DIVE17

Dive Transect 16 @ IDT10 (Mislabelled DIVET15 in GPS but changed to proper DIVET16)

DIVET15 is out from IDT8

~~1652 BL~~

~~1650 BL~~

1600 Downloaded dgps. Set up for next round of GPS collection.

1650 Motored to Area ID for further GPS work.

Shot DIVET14 END

shot DIVET13 END

Shot AREA ID, Transects 13-17.

shot AREA 2, Transects 1-8.6.

Batteries went dead in GPS unit.

Stopped at Area2 T-7.

1800 Refueled rec. unit.

1900 Returned to hotel. unloaded gear.

1905 Closed log book. BL

Marshall Sonkson
319-359-2754
ALCOA

Oct. 18 '95 (Wednesday)

Drive by ALCOA facility, after water tower w/ big "S" construction going on ~~around~~ back, met @ 10:30 AM with van - environment.

0800 Met for breakfast and health & safety meeting. Discussed plans for day.

0830 Loaded boat. Tested for satellite. Called Carl Gans regarding disposal of decon water. Carl contacted Marshall Sonkson. We contacted Marshall and scheduled a meeting to deliver the decon water.

1030 Delivered decon water to Marshall Sonkson. Drove to boat ramp.

1045 Picked up supplies at K&K Hardware.

1108 Sitting at base location. Waited to acquire satellite.

1250 Satellite available.

1251 Shot QD6 locations S1, S2, S3, S4
NOTE: Sediment samples just downstream of QD6 were shot in previously w/ above points.

1306 Shot HD, T12 - T17

- Advance Survey Equipment Service
  216 7th Ave S
  Nashville, TN 615-242-3762

- SOKKIA 257-2552 1-ECC-255-3913 /611/66
  9111 Barton
  Overland Park, KS (Kansas)
  66214
  Attn: Tech Support (Tim)
  x156
  (Oct 31 - letter sent to Tech support requesting assistance on data gathered Oct 18, 95
  7Am - 6Pm CST M-F

(913) 492-2427
Bulletin Board system.
S:\BXL\GPS\ → BASE926.RAW
(180,447)

Mark Redmonds 1-800-[redacted]257-2552
file: BASE926.FXD

Woodward-Clyde

2/3

ALCOA -
Davenport
95N0016/0020

Woodward-Clyde Consultants
357 Riverside Drive (37064) • P.O. Box 680925 (37068-0925)
Franklin, Tennessee

SHAW'S
PIONEERS SINCE 1831

account book S149

Available in 150 and 300 pages

ALCOA - Davenport
Water Sampling

No Units

Record Ruled, 27 Lines

WilsonJones.

ACCO USA, Inc., Wheeling, IL 60090

Made in U.S.A.

Reorder number stamped on backbone of this book

24Sept95 ALCOA - Davenport
Water Sampling

1517 ~~5½ feet deep~~ - bottom sample Sample 2-4.
Sample taken @ 5' deep (bottom sample)
Next sample taken @ 2' deep
Surface sample taken, location 100' from shore.

1520 Sample 2-4 - began pumping (filtering)
GPS programmed as 2-4, point # 100.

1600 End filtering of sample 2-4, Sample ID: W004-02-R10

1612 Water was 10 feet deep. Sample taken @ 9½ feet
For sample 2-6. Sample taken @ 5 feet of surface.
GPS @ 2-6 → pts. # 103 & 104. Location 100'
from shore.

~~1620~~

1620 Began filtering of Sample 2-6.
Sample ID: W006-02-R110

1645 End filtering of sample 2-6.

1700 Set up @ 3-1. Location 100' from shore.
GPS @ 3-1 → pts # 105 & 106

1710 Samples taken @ 12½ feet, 6½ feet, & surface.
Depth was 13 feet.
Began filtering Sample ID W001-03-R110

1735 Completed filtering.

Kathy Fillers

~~25 Sept 15~~ 60 TH 9/25/15

~~1025~~ Sample W001-01A-R~~70~~

1120 " 1A-1 location 10' from shore

Depth to bottom 8 feet

Samples @ 7½', 4', & surface.

1150 completed 1A-1 Filtering

1151 Begin 1A-1 MS Filtering.

1210 Begin 1A-1 MSD Filtering.

1215 Completed 1A-1 MS filtering

1223 Completed 1A-1 MSD filtering

1230 Sample W0001-01A-R160

Sample 1-R160 location 150' from shore.

Depth to Bottom 8 feet

Samples @ 7½', 4', & Surface

1237 Began filtering.

1300 Completed filtering.

1310 Sample 1-B1 W001-

Depth of 2' to Bottom. location 10' from shore

Samples @ 1½', 1', & Surface.

1315 Began filtering.

1337 Completed filtering.

1423 GPS shooting: 1B1 pt. # 1000, & 1001.

" " 1A-R160 pt. # 1002, & 1003

" " 1A-1 pt. # 1004 & 1005

~~2~~

1445 Travelled up Duck Creek to the Railroad Bridge. Took samples. Location: Center of creek. Depth was 2½ feet. Samples @ 2', 1', & Surface

1450 Began filtering @ ~~S~~ Duck.
GPS shooting: Duck pt #'s. 1006, & 1007

1525 End filtering of Duck.

1730 Set of equipment blanks began.

1800 Equipment blanks taken.
All samples were packed in coolers and readied for Fed Ex shipment.

Netting Follows

26 Sept 95 Water Sampling - Continued

1009 Positioned ourselves in place at transect
Sample ID: W005-03-R50
and 50' from shore. Sample cups labeled 3-5

1040 Depth of water was ~~11½ feet.~~ 10½ feet.

1115 Samples collected at ~~11', 6', and surface~~ "
" " 10', 5', and surface

1125 Filtering of sample(s) 3-5 began.

1150 Completed Filtering of 3-5 samples

1251 Set up @ Sample location W ——— ? to be determined
On map this is 1D-15. Section ID transect 15.
Depth of water: 4½ feet

1300 Samples collected @ 4 feet, 2 feet, & surface
Began filtering samples 1D-15.
Location was 50' from shore.

1330 Completed filtering of sample 1D-15

1332 Set up @ Sample 1D-16
Location was 50' from shore
Depth of water: 6½ feet deep.
Samples collected @ 6 feet, 3 feet, & surface.

1340 Began filtering 1D-16

1405 Completed filtering 1D-16

1415 Set up @ 1D-17. Location 100' from shore
Depth of water: 9 feet
Samples @ 8½ feet, 4½ feet, surface.

1430 Pulled 2 samples from each depth for
the ~~F/D~~ duplicated - duplicate.

1431 Begin filtering sample ID-17 and ID-17 Dup.

1520 completed filtering of samples.

1610 Samples carried to room for labelling & completing chain-of-custody.

Woodward-Clyde

3/3

ALCOA-
Davenport
95N0016/0020
Phase III - Sediment

Woodward-Clyde Consultants
357 Riverside Drive (37064) • P.O. Box 680925 (37068-0925)
Franklin, Tennessee

SEPT. 26, 1995 TUESDAY

0630 TRACY HIBNER THOMPSON (THT), ELIZABETH J TICEL (EJT) AND JIMMY RAYBURN (JR) MET FOR BREAKFAST.

0700 MET DON S. SPIRES (DLS), BARRY LONG (BL) AND TODD D. HUNT (TDH) ALONG WITH MARK S. GOODRICH (MSG) ALL FROM WOODWARD-CLYDE. HAD HEALTH AND SAFETY MEETING DURING BREAKFAST.

0800 HAD BRIEFING MEETING IN TDH'S ROOM. REVIEWED SAMPLE LOCATIONS AND SAMPLE ID NUMBERS. TDH REPORTED THAT WATER SAMPLING WOULD CONTINUE TODAY WITH SEDIMENT SAMPLING TO TENTATIVELY BEGIN TOMORROW

~~0830~~ BEGAN WALKING TRANSECTS IN AREA ID WITH EPA OVERSIGHT BRIAN RUNDELL. THT, DLS, AND EJT FROM WCC. STARTED AT DUCK CREEK AND MOVED DOWNSTREAM. COMPLETED 6 TRANSECTS 325'

1150 MOVED TO OUTFALL 1 TO WALK TRANSECTS DOWNSTREAM TO DUCK CREEK. TRANSECTS ARE ALSO 325 Ft APART. LEFT PLAN AT RAMP

1210 MET OTHER WCC CREW AND TRANSFERED EQUIPMENT. MSG CAME WITH THT, DLS, AND EJT TO OBSERVE SEDIMENT SAMPLING TECHNIQUES

1340 SEDIMENT CREW BEGAN PRACTICE SAMPLING IN DUCK CREEK WITH MSG (QA OFFICER). TOTAL LENGTH OF CORE 1 = 18". TOP 6" PLACED IN A STAINLESS STEEL BOWL (#1). THE REMAINING 6 - 12" WERE PLACED IN A SECOND STAINLESS STEEL BOWL (#2). CORE #2 WAS COLLECTED TOTAL LENGTH (TL) = 18". TOP 6" PLACED IN BOWL #1. REMAINING 6 - 12" PLACED IN BOWL #2. CORE #3 WAS COLLECTED BY THT. TL = 18" TOP 6" PLACED IN BOWL #1 AND REMAINING 6 - 18" PLACED IN BOWL #2. BOWL #1 WAS HOMOGENIZED AND PLACED INTO 3 - 4oz GLASS JARS BOWL #2 WAS HOMOGENIZED AND PLACED INTO 3 - 4oz GLASS JARS.

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EQUIPMENT WAS PUT AWAY UNTIL DE-ON PROCEDURES COULD BE ~~PERFORMED~~

~~THE~~ SEDIMENT CREW WAS JUST PRACTICING SEDIMENT COLLECTING TECHNIQUES FOR ACTIVITIES FOR LATER USE. JARS WERE EMPTIED AND DISCARDED.

1426 ~~STARTED~~ SEDIMENT CREW COMPLETED MARKING TRANSECTS IN AREA ID. 11 TRANSECTS UPSTREAM OF DUCK CREEK IN AREA ID.

1520 COMPLETED MARKING TRANSECTS IN AREA ID. WENT TO GPS WATER SAMPLE LOCATIONS. STOPPED ~~AT~~ AT WATER INTAKE TO SET UP GPS BASE AND EMPTY UNDER BLOCKS. ~~HAD~~ TO GET GAS FOR BOAT.

1630 Took GPS reading at location ID15 - point 101, 100

1635 Took GPS reading at ID-16 - points 102 + 103

1637 Took GPS reading at ID-17 - points 104 + 105

1645 Took GPS reading at 3-5 - points 106 + 107. DROPPED MSG OFF AT HIS CAR NEAR AREA 3. CREW WENT TO CHECK OUT REFERENCE AREA FOR TRANSECT PLACEMENT.

1733 CREW PULLED OUT BOAT AND RETURNED TO HOTEL.

1900 CLOSED LOGBOOK. Jim N. Thompson

~~SAT~~

SEPT. 27, 1995 WEDNESDAY

0700 CREW MET FOR BREAKFAST DLS SICK NOT WORKING TODAY.

0800 EJT AND JRT DECONNED SEDIMENT SAMPLING EQUIPMENT AND PREPARED SAMPLE CONTAINERS. MET EPA OVERSIGHT BRIAN RONDELL. BL AND JR WENT FOR SUPPLIES AND ICE. TDN DID PAPERWORK AND CHECKED ON WATER SAMPLE CONTAINERS.

1245 STARTED SEDIMENT SAMPLING AT AREA ID TRANSECT 14. PLACE BOUYS AT 25', 75' AND 125'

1305 PLACED BOUY AT 75' AT AREA ID TRANSECT 13.

1335 TDN AND JR BEGAN SEDIMENT CORING CORE #1 - 3" PLACED IN BOWL #1; CORE #2 TL = 9" 0-6" IN BOWL #1; 6-9" IN BOWL #2; CORE #3 TL = 7"; 0-6 IN BOWL #1; 6-7" IN BOWL #2; CORE #4 = 3.5"; CORE #5 TL = 6" CORES 1-4 WERE DISCARDED BECAUSE CORES NOT MEASURED CORRECTLY. CORE #6 TL = 9", CORE #7 TL = 6"; CORE #8 TL = 7", CORE #9 TL = 3.5", CORE #10 TL = 14" #11 = 7", CORE #12" = 5.5" FOR PARTICLE SIZE SPLIT SAMPLES WITH EPA Sgt SD14a-01D-R125-

1435 COMPLETED SAMPLING AT AREA ID TRANSECT 14 @ 25'

1445 CORE #1 TL = 27" CORE #2 TL = 5"; CORE #3 TL = 19" CORE #4 TL = 30"; SD14a-01D-R75 AND SD14b-01D-R75

1500 COMPLETED ID 14 - 75'

1510 STARTED AT AREA ID 14 25' CORE #1 TL = 4.5" USED FOR PARTICLE SIZE USED PONAR FOR SEDIMENT SAMPLE 0-6" DEEP. COLLECTED SAMPLE SD14a-01D-R000

1520 COMPLETED SAMPLE AT AREA ID 14 25' PARTICLE SIZE ONLY TAKEN AT 0-6" ~~DEEP~~ DEPTH. MOVING TO TRANSECT 13

SEPT. 27, 1995 CONT.

IN AREA 1D.

1540 NO SEDIMENT FOUND AT AREA ID 13 - 75' MOVED INTO S013Q-01D-R50 50'. COLE #1 TL=3". CHANGED TO PONAR FOR COLLECTION NO SEDIMENT AVAILABLE FROM 6+". EJT, BL, TAT LEFT TO DO GPS.

1602 BL AND EJT SET UP GPS REFERENCE AT THE ALCOA WATER INTAKE

~~ID14 125 POINTS AND ID14125B FOR AREA ID 125' 14 TRANSECT~~

AREA ID TRANSECT 14 75' - 2 POINTS ID1475 AND ID1475B

~~AREA ID TRANSECT 14 (E) - 2 POINTS~~

AREA ID 14 125' 2 POINTS 1005 AND 1006 - 30 EPOCHS

AREA ID 14 0' 2 POINTS 1007 AND 1008 -

AREA ID 13 50' 2 POINTS 1009 AND 1010

1653 ARRIVED AT BOAT RAMP TO TAKE OUT BOATS

AREA ID 14 125' HAS 4 GPS LOCATION POINTS ID14125B AND ID14125 ALONG 1005 AND 1006

PARTICLE SIZE FOR S014A-01D-R00 TOTAL WEIGHT = 222 g and 4 5" long. PACKED SAMPLES ON ICE.

1900 CLOSED LOG BOOK Tracy H. Thompson

TAT

SEPT. 28, 1995 THURSDAY

0700 MET FOR BREAKFAST.

JTD 0800 CALLED CARL CRANE TO GIVE UPDATE AND CHECK STATUS OF
DN WATER CONTAINERS

GPS. 0900 GOT EQUIPMENT TOGETHER AND LAUNCHED BOAT

0939 TH, BL AND EJT SET BOUY AT AREA I.D 17 75'

0943 TH, BL AND EJT SET BOUY AT AREA I.D 16 50'

0948 TH, BL AND EJT SET BOUY AT AREA I.D 15 50'

TDH AND BRIAN RUNDELL ANCHORED BARGE AT AREA I.D 17 75'
NO SEDIMENT FOUND AT AREA I.D 17 75' SO MOVED IN TO
50'. CORE #1 TL= 1" CORE #2 TL= 6" VENT TO
PONAR. COLLECTED S017A-OID-R50 NO SAMPLE
GREATER THAN 6" COLLECTED. PONAR AND COLE DEVICE
DECONNED WITH ALCONOX GROSS WASH, DI RINSE, METHANOL
RINSE AND FINAL DI RINSE. CREW MOVED TO AREA I.D 16.

1057 TOOK CORE AT AREA I.D 16 50'. COLE #1 < 2". TDH NOTED
B MORE SEDIMENT BUT EGGSHELL NOT KEEPING SEDIMENT IN
COLE DEVICE. TRIED CORE DEVICE WITH NO EGGSHELL BUT
GOT NO SEDIMENT. WENT TO PONAR. ONLY 0-6" SAMPLE
COLLECTED S016A-OID-R50. FOUND RELIC 3-RIDGE SHELL
AND LIVE YOUNG 3-RIDGE SPECIMEN.

1121 MOVED TO AREA I.D 15 50' CORE #1 TL= 9" CORE #2
TL= 13"; CORE #3 TL= 8"; CORE #4 TL= 8.5"
COLLECTED S015A-OID-R50 AND S015B-OID-R50 AND
S015A OID-R50 MS/MSD

1153 PULLED UP AT AREA I.D 12 00' CORE #1 TL= 20"
CORE #2 TL= 17.5"; CORE #3 TL= 6". COLLECTED

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SOI2A-OID-R00 AND SOI2B-OID-R00.

1247 WENT TO DUCK CREEK - UPSTREAM FROM MOUTH. ~~SOI1A-DCK-R00 AND SOI1B DCK R00~~ SOIA-DCK-R00. GPS ~~ALSO~~ COLLECTED AT WATER LOCATION. WATER AND SEDIMENT CO-LOCATED. SEDIMENT APPEARS TO BE DEEP BUT VERY LOOSE; WON'T STAY IN CORE DEVICE. USED PONAR TO COLLECT SAMPLE.

1331 BEGAN SCOUTING AREA ID 11 (MUD FLAT LOCATED JUST UPSTREAM OF MOUTH OF DUCK CREEK) SAMPLE TO BE COLLECTED AT 0'; CORE #1 TL= 18"; CORE #2 TL= 13.5" CORE #3 TL= 15" COLLECTED SOI1A-OID-R00 AND SOI1B-OID-R00.

1420 WENT TO AREA ID 10. HAVE 3 SAMPLE LOCATION 0', 50', AND 125'. MEASURED AND MARKED LOCATIONS. CORE #1 TL=17" CORE #2 TL=17" CORE #1 AT ID10 50 TL=15.5" ~~CORE~~ CORE #2 TL=15.5" CORE #1 AT ID10 125 TL=15" CORE #2 TL=17.5" COLLECTED SOI0A-OID-R00 AND SOI0B-OID-R00. ALSO COLLECTED SOI0A-OID-R50 AND SOI0B-OID-R50. ALSO COLLECTED SOI0A-OID-R125 AND SOI0B-OID-R125.

1516 TIM BL AND BRIAN RUNDELL WENT TO SET UP GPS REFERENCE UNIT BL PROGRAMMED THE UNIT.

1537 AREA ID 17 50' GPS READING POINTS 1011 AND 1012

1540 AREA ID 16 50' GPS READING POINTS 1013 AND 1014

1544 AREA ID 15 50' GPS READING POINTS ~~1015 AND~~ 1016 AND 1017.

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1549 AREA ID 12 0' GPS READING POINTS 1018 ~~1001~~ TNT AND 1019 PULLED THE BOATS OUT. RETURNED TO MOTEL TO PROCESS SAMPLES FOR SHIPMENT.

1815 COMPLETED EQUIPMENT RINSEATE WOOD2 - EQUIP. RIN

1830 COMPLETED CHAIN OF CUSTODY AND FED-EX AIRBILL # TDH TOOK COOLERS TO FED-EX. DLS, EJT, AND TNT PREPARED SAMPLE KITS. BL DOWNLOADED GPS DATA. CHAIN OF CUSTODY # 2008 AND # 2009. TNT UPDATED LOGBOOK

1930 CLOSED LOGBOOK. Tracy H. Thompson

SEPT. 29, 1995 FRIDAY

0700 WCC CREW MET FOR BREAKFAST. DLS HELD HEALTH AND SAFETY MEETING. JL OUT SICK. EJT AND DLS WENT TO WALMART FOR SUPPLIES. BL PREPARED EPS EQUIPMENT

0915 MET BRIAN RUNDELL AT BOAT RAMP. TDH, EJT AND BL SET BUOYS AT AREA ID TRANSECTS 8, 7, AND 6. TDH

1005 TDH PULLED FIRST CORE AT AREA ID 8 25' BUT FOUND NO SEDIMENT. PULLED A PONAR GRAB AND GOT RELIC MUSSEL SHELLS. DECIDED TO MOVE IN TO 0' NO SEDIMENT FOUND AT 0'. NO SAMPLE TAKEN AT AREA ID TRANSECT 8.

√1027 MOVED TO AREA ID TRANSECT 9 100'. EPA DECIDED TO SPLIT HERE. CORE 1 TL= 15"; CORE #2 TL = 28.5" #3 TL = 21.5" TL CORE #4 USED FOR PARTICLE SIZE TL = 22'

0-6" TL = 6" = PARTICLE SIZE TOTAL WEIGHT (TW) = 384g

6+' TL = 16" = PARTICLE SIZE TW = 1230g

1049 COMPLETED COLLECTION AT AREA ID 9; SOOT AND ID-LOST ~~TDH SOOT-ID~~

1055 CHECKED SEDIMENT AT AREA ID 7 0'. NO SEDIMENT AVAILABLE NO SAMPLE COLLECTED.

1109 CHECKED SEDIMENT AT AREA ID 6 125'. NO SEDIMENT. NO SAMPLE COLLECTED. MOVED IN TO 100' AND 75' NO SEDIMENT FOUND. MOVED IN TO 50' NO SEDIMENT. CHECKED 0'. NO SEDIMENT FOUND.

1139 CHECKED AREA ID 5 100'. NO SEDIMENT. MOVED IN TO 75', 50', 25' AND 0'. NO SAMPLE COLLECTED

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1143 CHECKED AREA ID 4 100' NO SEDIMENT. MOVED IN TO 75', 50', 25', AND 0'. NO SAMPLE COLLECTED. SUBSTRATE HT APPEARED TO BE ROCK.

✓ 1151 CHECKED AREA ID 3 0'. SEDIMENT FOUND. CORE <6" PONAR USED TO COLLECT. S003A-QID-R00

1225 CHECKED AREA ID 2 @ 25', 75' AND 125'. NO SEDIMENT FOUND AT 125, 100, 75, 50, 25' 3 CORES COLLECT AT ID 2 0'. CORE #1 TL = 14.5"; CORE #2 TL = 20"

✓ GOT S002A-QID-R00 AND S002B-QID-L00.

CORE #3 TL = 16" FOR PARTICLE SIZE.

PARTICLE SIZE: 0-6" TL=6" TW = 386g

: 6-24" < 10" TW = 739g

1246 ✓ TAKING DISCRETIONARY SAMPLE JUST DOWNSTREAM OF WINGDAM LOCATED IN AREA ID BETWEEN TRANSECTS 1 AND 2. PONAR USED TO COLLECT SAMPLE. S001A-QID-R00.

1334 ✓ MOVED TO AREA ID 1 25'. CORE #1 TL = 12.5" CORE #2 TL = 17" CORE #3 TL = 3.5" S001A-QID-L25 AND S001B-QID-R25

1352 DECONNED EQUIPMENT.

1403 ✓ MOVED TO AREA ~~ID~~ TH1 ID 1 0'. CORE #1 TL = 20" CORE #2 TL = 8" CORE #3 TL = 14" CORE #4 TL = 7" CORE #5 TL = 8". THEN TOOK 1 PONAR GRAB TO GET VOLUME FOR EPA SPLIT (MS/MSD). COMPLETED TH1 SAMPLING AREA ID. S001A-QID-R&L AND S001B-QID-R00

1444 TH1, EJL AND BL COUNTED TRANSECTS IN AREA 1C. BL SET UP GPS REFERENCE POINT AT ALCOA WATER INTAKE.

SEPT. 29, 1995 CONT.

WCC COUNTED 15 TRANSECTS MOVING UPSTREAM IN AREA IC. COUNTED 16 TRANSECTS. WILL GET RID OF ONE TRANSECT ON THE FIGURE.

1501 BL TAKING GPS READINGS. EJT MOVED TO BOAT WITH DLS AND TDN STARTED SAMPLING AREA IC. 16 400' CORE DEVICE ~~USED TO COLLECT~~ DID NOT COLLECT SEDIMENTS PONAR USED. 0-6" COLLECTED SD16A-01C-R100 AND SD16A-01C-R100 MS/MSD GPS READINGS AT AREA IC TRANSECT 16; 100' POINTS 1020 AND 1021

1512 AREA ID TRANSECT 1; 25' GPS POINTS 1022 AND 1023.

AREA ID TRANSECT 1; 0' GPS POINTS 1024 AND 1025

AREA ID DISCRETIONARY SAMPLE 1; 0' GPS POINTS 1026 + 1027

1523 AREA ID TRANSECT 2; 0' GPS POINTS 1028 + 1029

1528 AREA ID TRANSECT 3; 0' GPS POINTS 1030 AND 1031

1532 AREA ID TRANSECT 9; 100' GPS POINTS 1032 AND 1033

1539 AREA ID TRANSET 11; 0' GPS POINTS 1034 AND 1035

1553 AREA ID TRANSECT 10; 125' GPS 1040 AND 1041

1551 AREA ID TRANSECT 10; 50' GPS 1038 AND 1039

1549 AREA ID TRANSECT 10; 0' GPS 1036 AND 1037

— DLS, EJT, AND TDN RETURNED TO MOTEL.

1630 TNT AND BL PULLED BOAT AND GPS REFERENCE UNIT

1715 TNT AND BL RETURNED TO THE MOTEL. PLACED SAMPLES ON ICE. WILL NOT SHIP SAMPLES TODAY. WILL HOLD SAMPLES ON ICE TO SHIP MONDAY.

1730 CLOSED LOGBOOK. Nancy L. Thompson.

SEPT. 30, 1995 SATURDAY

0700 LCC CREW MET FOR BREAKFAST. DLS HELD HEALTH AND SAFETY MEETING.

0907 TDH AND TAT DECIDED TO GET RID OF ONE TRANSECT IN WORKPLAN BECAUSE ONLY 16 TRANSECTS PRESENT IN AREA IC.

0830 LCC CREW LAUNCHED BOATS TAT, EJT, AND BARLY LONG MARKED TRANSECTS. DLS SENT FOR SUPPLIES FOR MUSSELLING ACTIVITIES NEXT WEEK. TDH AND JR DATED FOR EPA OVERSIGHT - BRIAN RUNDELL.

0902 EJT, BL, AND TAT SET BUOYS AT AREA IC TRANSECT 15 0'.

0924 EJT, BL AND TAT SET BUOYS AT AREA IC TRANSECT 14 0'; 25'; 75'; 125'

0930 SET BUOYS AT AREA IC TRANSECT 13 0' AND AREA IC TRANSECT 12 0' AND 125'

0953 TDH AND BL COLLECTED SEDIMENT FROM AREA IC TRANSECT 15 0'. CORE #1 TL = 16.5"; CORE #2 TL = 14". COLLECTED SAMPLES - SO15A-0IC-R00 AND SO15B-0IC-R00. HNU BACKGROUND READING 1. SO15B-0IC-R00 READING 0.5 ABOVE BACKGROUND. JR REPORTED HNU NOT BEST INSTRUMENT FOR RAINY DAMP WEATHER. STATED RAINING. VERY WINDY RIVER VERY ROUGH.

1009 TDH AND BL COLLECTED SEDIMENT AT AREA IC TRANSECT 14 25' CORE #1 TL = 11.5"; CORE #2 TL = 13" AND CORE #3 TL = 17" TDH REPORTED MORE SEDIMENT AVAILABLE THAN COLLECTED. SEDIMENT VERY DEEP - MAY NOT BE ABLE TO GET CORING DEVICE OUT IF PUSHED DEEPER COLLECTED

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SAMPLES SD14A-DIC-R25; SD14A-DIC-R25 MS/MSD; SD14B-DIC-R25. JR DECONNING EQUIPMENT

1031 COLLECTED SEDIMENT AT AREA IC TRANSECT 14 0'. CORE #1 TL=9.5"; CORE #2 TL=12". COLLECTED SAMPLES SD14A-DIC-R00 AND SD14B-DIC-R00

1056 COLLECTED SEDIMENT AT AREA IC TRANSECT 14 75'. EPA WILL SPLIT THIS SAMPLE. CORE #1 TL=19.5"; CORE #2 TL=19"; CORE #3 TL=20.5"; CORE #4 TL=21.5". BEGAN THUNDERING AND LIGHTNING. SAMPLES WERE SECURED WITH ALUMINUM FOIL AND SAMPLING STOPPED FOR ~~HE~~ SAFETY CONCERNS REGARDING THE LIGHTNING. SAMPLE TO BE PROCESSED AT THE HOTEL.

1130 PULLED BOATS OUT OF WATER AND RETURNED TO HOTEL.

1157 PROCESSED SAMPLES FROM AREA IC TRANSECT 14 75' SD14A-DIC-~~R00~~ R75 AND SD14B-DIC-R75. EPA SPLIT SAMPLE SD14B-DIC-R75.

1213 BEGAN PROCESSING AND LABELING SAMPLES. PLACED SAMPLE ON ICE

1318 EQUIPMENT RINSEATE COLLECTED - WOO3-EQUIP RIN

1420 CLOSED LOGBOOK. Nancy A. Thompson

11

OCT. 1, 1995 SUNDAY

0930 WOL CREW MET FOR BREAKFAST. DLS HELD HEALTH AND SAFETY MEETING. EJT, TH, AND DLS WENT TO WALMART FOR SUPPLIES WHILE TDH, JR, AND BL LAUNCHED BARGE TO COLLECT SEDIMENT SAMPLES FROM AREA IC TRANSECT 14.

1131 TDH, EJT, AND DLS MET OTHER CREW AT AREA IC TRANSECT 14 125'. CORE # 1 TL = 20" AND CORE # 2 TL = 20" COLLECTED SAMPLES S0014A-DIC-R125 AND S0014B-DIC-R125. BL DECONNED EQUIPMENT.

1157 MOVED TO AREA IC TRANSECT 13 125'. CORE # 1 TL = 18.5" CORE # 2 TL = 18". COLLECTED SAMPLES S0013A-DIC-R125 AND S0013B-DIC-R125.

1205 MOVED TO AREA IC TRANSECT 13 0'. CORE # 1 TL = 6.5" CORE # 2 TL = 14"; CORE # 3 TL = 14.5". COLLECTED SAMPLES S0013A-DIC-R00 AND S0013B-DIC-R00. CORE # 3 WAS USED FOR SEDIMENT DENSITY/PARTICLE SIZE.

0-6" TL = 6" - PARTICLE SIZE TW = 431 g

6+" TL = 8.5" - PARTICLE SIZE TW = 790 g

1216 MOVED TO MOUTH OF OUTFALL 002. COLLECTED A SAMPLE FROM THE MOUTH OF OUTFALL 002. CORE # 1 TL = 10.5" AND CORE # 2 TL = 11". COLLECTED SAMPLES S0D02A-DIC-R00 AND S0D02B-DIC-R00.

1236 MOVED TO AN AREA BETWEEN TRANSECT 15 AND TRANSECT 14 IN AREA IC. CORE # 1 TL = 20" AND CORE # 2 TL = 20". COLLECTED SAMPLES S0D1A-DIC-R00 AND S0D1B-DIC-R00.

1318 MOVED TO AREA IC TRANSECT 12 0'. EPA (BRIAN RUNDELL) SPLIT SAMPLE LOCATION. CORE # 1 TL = 17", CORE # 2 TL = 14.5"

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CONT.

CORE #3 TL=16" AND CORE # 4 TL= 13.5". COLLECTED SAMPLES SD12A-DIC-R000; SD12B-DIC-R000; AND SD12B-DIC-R000 (MS/MSD SAMPLE)

1335 MOVED TO AREA IC TRANSECT 12 100'. CORE #1 TL=14" AND CORE #2 TL=13". COLLECTED SAMPLES SD12A-DIC-R000 AND SD12B-DIC-R000. BL DECONNED EQUIPMENT WHILE DLS WORKED ON FIELD SUPPLIES FOR MUSSEL SAMPLING CREW. BL OJT AND TNT SET OUT BOUYS AT AREA IC TRANSECT 10 75'; AREA IC TRANSECT 9 100'; AND AREA IC TRANSECT 8 0'. JR AND TDW WENT TO GET LUNCH

1517 TNT, OJT AND BL SET BOUYS AT AREA IC TRANSECT 11 0' AND TRANSECT 11 50'; AND TRANSECT 11 125'

1547 SAMPLING CREW MOVED TO AREA IC TRANSECT 11 0'. CORE #1 TL= 8"; CORE #2 TL= 13" AND CORE #3 TL= 12.5". A SEDIMENT SAMPLE WAS ALSO COLLECTED FOR VOC. COLLECTED SAMPLES SD11A-DIC-R00 AND SD11B-DIC-R00.

1606 MOVED TO AREA IC TRANSECT 11 50' CORE #1 TL= 17" AND CORE #2 TL= 20". COLLECTED SAMPLES SD11A-DIC-R50 AND SD11B-DIC-R50.

1610 MOVED TO AREA IC TRANSECT 11 125'. NO SEDIMENT FOUND. MOVED IN UNTIL HIT THE 50' LOCATION.

1620 MOVED TO AREA IC TRANSECT 10 75'. NO SEDIMENT COLLECTED WITH CORE. TRIED PONAR NO SEDIMENT COLLECTED. MOVED IN TO 75' - NO SEDIMENT COLLECTED MOVED IN TO 50', 25', AND 0' ALL ROCK NO SEDIMENT AVAILABLE. 25'; COLLECTED SAMPLE USING PONAR.

OCT. 1, 1995 CONT.

COLLECTED SAMPLE SOIOA-OIC-R25.

1636 MOVED TO AREA IC TRANSECT 9 100'. NO SEDIMENT AVAILABLE. MOVED IN TO 75'; 50'; 25', AND 0'. NO SEDIMENT AVAILABLE. VERY ROCKY (INCLUDING MUSSELS) SUBSTRATE.

NOTE THAT IN AREA IC FROM TRANSECT 15 TO TRANSECT 10 AREA HAS DEEP SEDIMENTS; MALE SEDIMENT WAS AVAILABLE THAN WAS COLLECTED

1647 BL, TDH, AND TMT WENT TO SET UP GPS REFERENCE AREA. COULD NOT TRACK ENOUGH SATELLITES TO GET READINGS.

1715 PULLED BOATS OUT OF WATER AND RETURNED TO THE MOTEL. JR, BL AND DLS TRANSFER ALL SEDIMENT SAMPLING EQUIPMENT TO THE BARGE. DLS TAKING HYDROGRAPHIC BOAT FOR MUSSEL SURVEY. TMT, EJT, AND TDH PROCESSED SAMPLES.

1907 TMT DID CHAIN OF CUSTODYS AND COMPLETED LOGBOOK.

1947 CLOSED LOGBOOKS. TMT Thomas H. Thompson

OCT. 2, 1995 MONDAY

OC

0700 BCL CREW MET FOR BREAKFAST. DLS HELD HEALTH AND SAFETY MEETING AND REPORTED THAT HE WOULD BE WITH MUSSEL SAMPLING CREW.

0743 JR. TOOK EQUIPMENT INVENTORY - W0004 - EQUIP RIN. TRI AND EST CHECK CHAIN OF CUSTODY FORM TDA COMPLETED DAILY ACTIVITY REPORTS. BCL DOUBLE CHECKED EQUIPMENT TRANSFER INTO BARGE

1115 MET EPA OVERSIGHT BRIAN RUNDELL AT THE BOAT RAMP. WE DECIDED TO COLLECT 4 SAMPLES IN ORDER TO KEEP CLUTTER ON THE BARGE A MINIMUM

1134 SET BUOY AT AREA IC TRANSECT 5 75'. COLLECTED CORES. CORE # 1 TL= 18"; CORE # 2 TL= 8.5", CORE # 3 TL= 19.5" (USED FOR PARTICLE SIZE ANALYSIS) COLLECTED SAMPLES S0005A-DIC-R75 AND S0005B-DIC-R75. EPA SPLIT S0005A-DIC-R75.

R PARTICLE SIZE SAMPLES 0-6" TL= 6" TW= 542g
6+" TL= 12.5" TW= 938g

BL DECONNED EQUIPMENT. TDA NOTED MORE SEDIMENT IS AVAILABLE THAN COLLECTED - SEDIMENT SEEMS VERY LOOSE EVEN WITH CORE CATCHER. PARTICLE SIZE COLLECTED BECAUSE NO SEDIMENT AVAILABLE AT AREA IC TRANSECT 9.

1201 MOVED TO AREA IC TRANSECT 3 0', 50', AND 100'. COLLECTED CORES FROM AREA IC TRANSECT 3 50'. CORE #1 TL= 10.5; CORE # 2 TL= 11.5" COLLECTED

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SAMPLES S0003A-01C-R50 AND S0003B-01C-R50.

LD 1233 MOVED TO AREA 1C TRANSECT 3 0'. COLLECTED CORES. CORE# 1 TL= 12"; CORE# 2 TL= 13"; CORE# 3 TL= 14.5" CORE# 4 TL= 14.5". COLLECTED SAMPLES S0003A-01C-R00; S0003A-01C-R000 (MS/MSD); AND S0003B-01C-R00 EPA SPLIT S0003B-01C-R00

1248 MOVED TO AREA 1C TRANSECT 3 125'. COLLECTED A CORE. CORE# 1 TL= 6.5". NOT ENOUGH SEDIMENT AVAILABLE FOR SAMPLE 6" DEEP. USED PONAR TO COLLECT NECESSARY VOLUME. COLLECTED SAMPLE S0003A-01C-R25

1324 MOVED TO AREA 1B TRANSECT 1 0'. CORE DEVICE WAS USED BUT SEDIMENT VERY SHALLOW. USED PONAR TO COLLECT SAMPLES. COLLECTED S0001A-01B-R00. ALSO COLLECTED TWO (2) 4 OZ JARS FOR PARTICLE SIZE/ SEDIMENT DENSITY. JAR# 1 4OZ TW = 220g JAR# 2 4 OZ TW= 214g

542g 1346. MOVED TO AREA 1B TRANSECT 1 100'. NO SEDIMENT AVAILABLE MOVED IN TO 75'; 50') AND 25'. NO SEDIMENT COLLECTED.

c.938g 1352 MOVED TO AREA 1B TRANSECT 5 100'. TOW REPORTED NO SEDIMENTS NO SEDIMENT BEYOND 25'. TOOK PONAR AT 0'. SEDIMENT VERY SHALLOW. EPA WILL SPLIT SAMPLE: S0005A-01C-L00.

1402 MOVED BACK TO AREA 1C TRANSECT 8 0'. CORE COLLECTED CORE# 1 TL= 1.5" MOVED TO PONAR TO COLLECT SAMPLE COLLECTED SAMPLE ~~S0008~~ S0008A-01C-R00. COLLECTED TWO (2) 4 OZ JARS FOR PARTICLE SIZE.

OCT. 2, 1995 CONT.

JAR #1 TW TL= 175g JAR #2 TW TL= 175g

1456 BL SET UP GPS REFERENCE UNIT. TDH AND BL CARRIED ROVER

~~ARES~~ AREAS IC TH TS TRANSECT 15 00'

AREA IC ~~TRANSECT~~ D1 0'

AREA IC TRANSECT 14 75'

AREA IC TRANSECT 14 125'

AREA IC TRANSECT 14 0'

AREA IC TRANSECT 14 25'

AREA IC D2 00' (MOUTH OF OUTFALL 002)

AREA IC TRANSECT 13 0'

AREA IC TRANSECT 13 125'

AREA IC TRANSECT 12 0'

AREA IC TRANSECT 12 100'

AREA IC TRANSECT 11 00'

AREA IC TRANSECT 11 50

COULD NOT COLLECT POINTS AT AREA IC TRANSECT 10 25'.

1550 SET BOUYS AREA IC TRANSECT 7 25'; 75'; 125'

COLLECTED SEDIMENT AT AREA IC TRANSECT 7 25'

CORE # 1 TL= 17.5"; CORE # 2 TL= 15.5"

COLLECTED SAMPLES S007A-DIC-R25 AND

S007B-DIC-R25

1606 MOVED TO AREA IC TRANSECT 7 75'. COLLECTED SEDIMENT. CORE # 1 TL= 21.5" AND CORE # 2 TL= 18.5. COLLECTED ~~SAD~~ SAMPLES S007A-DIC-R75 AND S007B-DIC-R75.

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1623 MOVED TO AREA 1C TRANSECT 7 125'. NO SEDIMENT COLLECTED WITH CORE DEVICE USED PONAR TO COLLECT SAMPLE. COLLECTED SAMPLE 5007A-01C-R125

1627 PULLED BOAT FROM RIVER. STOPPED AND GOT ICE TO SHIP SAMPLES

1653 RETURNED TO MOTEL. PACKED SAMPLES AND EQUIPMENT RINSEATE SAMPLE ON ICE WITH CHAIN OF CUSTODY FORMS. SENT 4 (FOUR) COOLERS ON FEDEX AIRBILL # 695425590 6; 695425591 0; 695425592 1, AND 695425593 2. BL AND TDH TOOK SAMPLES TO FEDEX FOR SHIPMENT. TNT, EJT, AND JR COMPLETED LABELS FOR SAMPLES COLLECTED 10/2/95 (TODAY) SAMPLES WERE PLACED IN BUBBLE-WRAP AND ZIPLOC BAGS AND THEN PLACED ON ICE.

1753 TNT UPDATED LOG BOOK AND BEGAN CHAIN OF CUSTODY FORMS. CLOSED LOG BOOK. Tracy H. Thompson

OCT 3, 1995 TUESDAY

0700 WCC CREW MET FOR BREAKFAST. DW HELD HEALTH AND SAFETY MEETING.

0930 EJT AND TNT PERFORMED EQUIPMENT RINSATE. W0005 - EQUIP RN. TDN COMPLETED PAPERWORK. JR AND BL PREPARED EQUIPMENT FOR SAMPLING

1043 LAUNCHED BOAT AND MOVED TO AREA IC TRANSECT 6.

1113 COLLECTED SEDIMENT AT AREA IC TRANSECT 6 0' CORE #1 TL= 16"; CORE #2 TL = 14"; CORE #3 TL= 14". COLLECTED S0006A-DIC-R000 AND S0006B-DIC-R000. COLLECTED PARTICLE SIZE. S0006A-DIC-R000 TW = 444g TL=6" S0006B-DIC-R000 TW= 321g TL 3"

1123 MOVED TO AREA IC TRANSECT 6 100'. COLLECTED CORE #1 TL= 25.5"; CORE #2 TL= 24". COLLECTED S0006A-DIC-R000 AND S0006B-DIC-R000.

1138 MOVED TO AREA IC TRANSECT 4 100' COLLECTED S0004A-DIC-R000 AND S0004B-DIC-R000 CORE #1 TL = 15.5"; CORE #2 TL= 14'

1157 MOVED TO AREA IC TRANSECT 4 100'; COLLECTED CORE #1 TL= 21.5"; CORE #2 TL= 19.5" COLLECTED SAMPLES S0004A-DIC-R000 AND S0004B-DIC-R000. BL AND JR DECONNED EQUIPMENT. WENT TO TRUCK TO GET ADDITIONAL EQUIPMENT AND LUNCH.

1320 WENT TO AREA IC TRANSECT 2 50'. NO SEDIMENT AVAILABLE. MOVED INTO 25' AND 0'. SHALLOW SEDIMENT AVAILABLE AT 0'. USED PONAR TO GRAB THE SAMPLE. COLLECTED S0002A-DIC-R000.

1338 MOVED TO AREA IC TRANSECT 1 0'. SEDIMENT VERY SHALLOW NO CORE DEVICE USED. SAMPLE COLLECTED USING

Oct. 3, 1995 CONT.

PONAR COLLECTED SOD1A-DIC-ROD.

1405 MOVED TO AREA IC BETWEEN TRANSECTS 3 AND 4. COLLECTED CORE # 1 TL = 13.5"; CORE # 2 TL = 12.5". BACKGROUND HNU = 1 ppm. SAMPLE FROM >6" DEPTH = 4 ppm (3 ABOVE BACKGROUND) VOC SAMPLE COLLECTED. COLLECTED SOD7A-DIC-ROD AND SOD7B-DIC-ROD.

1411 BL SET UP GPS REFERENCE UNIT. MOVED TO AREA AROUND OUTFALL 005. COLLECTED CORES AT OUTFALL 005 CORE # 1 TL = 18" AND CORE # 2 TL = 19". HNU BACKGROUND = 1.2 ppm SAMPLE COLLECTED >6" DEPTH = 1.8 ppm COLLECTED SOD5A-DIC-ROD AND SOD5B-DIC-ROD.

MOVED ABOUT 30 FEET DOWNSTREAM. COLLECTED CORE # 1 TL = 17"; CORE # 2 TL = 19". COLLECTED SOD4A-DIC-ROD AND SOD4B-DIC-ROD. HNU BACKGROUND = 1.2 ppm SAMPLE >6" DEPTH = 1.2.

1501 UNIT DOWNSTREAM OF OUTFALL 003. COLLECTED CORE # 1 TL = 16" AND CORE # 2 TL = 15". COLLECTED SOD3A-DIC-ROD AND SOD3B-DIC-ROD HNU BACKGROUN = 1.2 ppm SAMPLE >6" DEPTH = 1.4 ppm.

BEGAN COLLECTING GPS POINTS FOR LOCATIONS AREA IC TRANSECT 10 25'; AREA IC TRANSECT 5 45'; AREA IC TRANSECT 3 50'; AREA IC TRANSECT 3 0'; AREA IC TRANSECT 3 125'; AREA IC TRANSECT 8 0'; AREA IC TRANSECT 7 25'; AREA IC TRANSECT 7 75'; AREA IC

OCT 3, 1995 CONT.

TRANSECT 7 125'; AREA IC TRANSECT 6 0'; AREA IC TRANSECT 6 100'; AREA IC TRANSECT 4 0'; AREA IC TRANSECT 4 100'; AREA IC TRANSECT 2 0'; AREA IC TRANSECT 1 0'; AREA IC D7 0'; AREA IC D5 0'; AREA IC D4 0'; AREA IC D3 0'.

1630 PULLED BOAT OUT AND RETURNED TO MOTEL TO PROCESS SAMPLES. DURING PROCESSING NOTICED THAT SAMPLES COLLECTED AT AREA IC TRANSECT 6 AND AREA IC TRANSECT 4 WERE LABELED INCORRECTLY AND COULD NOT BE DECIDED WHICH LOCATIONS. DISCARDED SAMPLES FROM BOTH LOCATIONS. WILL RESAMPLE BOTH LOCATIONS. SHIPPED ONE COOLER FOR ANALYSES. PREPARED CHAIN OF CUSTODY FORMS

FED-EX AIRBILL # 695425589 5

1930 CLOSED LOGBOOK. Tracy H. Thompson

TNT

OCT 4, 1995 WEDNESDAY

AREA 0'. 10 0'.

0700 WLC CREW MET FOR BREAKFAST DLS HELD HEATH AND SAFETY MEETING.

0820 JR AND BARRY LOAD TOOL EQUIPMENT INSTATE. WOOD-EQUIPMENT AM AND EOT READIED SAMPLES FOR SHIPMENT.

0950 MOVED TO AREA IC TRANSECT 6 0'. CORE #1 TL= 15.5" CORE #2 TL=16.5" CORE #3 TL=16" (FOR PARTICLE SIZE) COLLECTED S0006A-01-R000 ✓ AND S0006B-01C-R00 ✓

THAT 1016 MOVED TO AREA IC 6 100 CORE #1 TL=27" CORE #2 TL=18.5" COLLECTED S0006A-01C-R100 ✓ AND S0006B-01C-R100 ✓ S0006B-01C-R700 (MS/MSD).

D 1026 MOVED TO AREA IC 4 0'. CORE #1 TL=12" CORE #2 TL=15" COLLECTED S0004A-01C-R00 ✓ AND S0004B-01C-R00 ✓

LY 1039 MOVED TO AREA IC 4 100'. CORE #1 TL=24" CORE #2 TL=25 COLLECTED S0004A-01C-R100 ✓ AND S0004B-01C-R100 ✓ COMPLETED

2 SAMPLING AREA IC.

KMS 1035 MOVED TO AREA IB TO COUNT TRANSECTS. AREA ONLY CONTAINED 9 TRANSECTS INSTEAD OF 11. MOVED TO AREA IB TRANSECT 8. 0'; 50'; AND 75'. NO SEDIMENT AT 75' AND 50' OR 0'. NO SAMPLE COLLECTED.

1120 MOVED TO AREA IB TRANSECT 8 50' ~~MOVED IN TO 25'~~ NO SEDIMENT. MOVED IN TO 25'. NO SEDIMENT MOVED TO 0'. NO SEDIMENT. NO SAMPLE COLLECTED.

1124 MOVED TO AREA IB TRANSECT 7 25'. NO SEDIMENT MOVED IN TO 0'. USED RONAR TO COLLECT SAMPLE. AFTER SEVERAL RONAR GRABS - COLLECTED ONLY ROCKS. NO SEDIMENT ONLY GRAVEL NO SAMPLE COLLECTED.

OC OCT. 6 1995 CONT.

1131 MOVED TO AREA 1B TRANSECT 6 @ 75'; AND 125'
NO SEDIMENT AT 125' AND 75'. MOVED IN TO 0'
FOUND SEDIMENT WITH PONAR & COLLECTED S006A-01B-R000 ✓

1150 MOVED TO AREA 1B TRANSECT 4 100'. NO SEDIMENT MOVED
IN TO 0'. USED PONAR TO COLLECT SEDIMENT. COLLECTED
S004A-01B-R000 ✓ COLLECTED TWO (2) 4 OZ JARS
S004A-01B-R000-1 FOR PARTICLE SIZE. MOVED IN TO 25' FOUND SOME
TW= 1905 SHALLOW SEDIMENT AND COLLECTED BECAUSE SEVERAL
S004A-01B-R000-2 TRANSECTS THAT HAD NO SAMPLE. S004A-01B-R25 ✓
DUP= 1765
1207 MOVED TO AREA 1B TRANSECT 3. 75'. USED PONAR TO
COLLECT SAMPLE. COLLECTED S003A-01B-R75 ✓
MOVED INTO AREA 1B TRANSECT 3 50' USED PONAR. COLLECTED
S003A-01B-R50 ✓ THAT ~~AND S003~~

1229 MOVED TO AREA 1B 3 0'. USED PONAR TO COLLECT
SAMPLE S003A-01B-R000 ✓
MOVED TO AREA 1B 2 0' THAT. USED PONAR COLLECT SAMPLE
S002A-01B-R000 ✓
MOVED TO AREA BETWEEN TRANSECT 1 AND 2. USED PONAR
TO COLLECT SAMPLE S001A-01B-R000 ✓ WENT BACK TO
BOAT RAMP TO GET GLOVES AND LUNCH

1357 BL SET UP GPS REFERENCE UNIT
WENT TO AREA 1B TRANSECT 6 0' GPS POINTS 2000 + 2001
AREA 1B TRANSECT 4 0' GPS POINTS 2002 AND 2003
AREA 1B TRANSECT 4 25' GPS POINTS 2004 AND 2005
AREA 1B TRANSECT 3 75' GPS POINTS 2006 AND 2007

1415 AREA 1B TRANSECT 3 50 GPS POINTS 2008 AND 2009

Oct 4, 1995 CONT.

AREA 1B TRANSECT 3 0' GPS POINTS 2010 AND 2011

AREA 1B TRANSECT 2 0' GPS POINTS 2012 AND 2013

3000 1421 AREA 1B D1 0' GPS POINTS ~~2013~~ 2014 AND 2015

MOVED TO AREA 1A TRANSECT 6 75' COLLECTED CORE# 1 TL = 14.5" CORE# 2 TL = 14". COLLECTED S006A-01A-R75 AND S006B-01A-R75 GPS POINTS 2016 AND 2017.

MOVED TO AREA 1A TRANSECT 5 0', 50', AND 100'

1444 CORE# 1 TL = 10.5"; CORE# 2 TL = 15" COLLECTED S005A-01A-R00 AND S005B-01A-R00 GPS POINTS 2018 AND 2019.

1453 MOVED TO 1A 5 50'. COLLECTED CORE# 1 TL = 13.5" CORE# 2 TL = 14.5". COLLECTED S005A-01A R50 AND S005B-01A-R50 GPS POINTS 2020 AND 2021

MOVED TO 1A 5 100' COLLECTED CORE# 1 TL = 14" CORE# 2 TL = 18". COLLECTED S005A-01A-R00 AND S005B-01A-R00. GPS POINTS 2022 AND 2023.

1503 MOVED TO 1A 4 25' COLLECTED CORE# 1 TL = 14.5" CORE# 2 TL = 14.5". COLLECTED S004A-01A-R25 AND S004B-01A-R25 GPS POINTS 2024 AND 2025.

1513 MOVED TO 1A 3 50' COLLECTED CORE# 1 TL = 16.5" ~~S003A S003B~~ CORE# 2 TL = 15". GPS POINTS 2026 AND 2027

2001 1524 MOVED TO 1A 2 75' COLLECTED CORE# 1 ~~TL =~~ NO SEDIMENT ~~CORE# 2 TL =~~ GPS POINTS 2028 AND 2029

COLLECTED SAMPLE WITH PONAR. COLLECTED S002A-01A-R75

1537 MOVED TO 1A 1 0', 50', 125' NO SEDIMENT AT 125'

9 MOVED IN TO 100' NO SEDIMENT. MOVED IN TO 75'

GOT 4/1796 COORD GPS POINTS 2034 AND 2035 CC

CC MUD SEDIMENT WITH CORE USED PONAR. COLLECTED S0001A-01A-R75 ✓CC

AREA 1A 1 0' GPS POINTS 2030 AND 2031.

GOT CORE #1 TL= 16" CORE #2 TL= 15" . AREA 1A 1

0'. COLLECTED S0001A-01A-R00 ✓ AND S0001B-01A-R00 ✓

15 40 MOVED TO AREA 1A 1 50. COLLECTED CORE #1 TL=18 4

S0001A-01A-R50 CORE #2 TL=23.5" CORE #3 TL= 24" (PARTICLE SIZE)

TL=6" TW=443g COLLECTED S0001A-01A-R50 AND S0001B-01A-R50. AND

S0001B-01A-R50 TL= 18" TW= 1414g GPS POINTS 2032 AND 2033. MS/MSD COLLECTED S0001A-01A-R700 ✓

1617 BL LEFT TO GET GPS REFERENCE UNIT.

1630 POLLED BOAT OUT OF THE RIVER. STOPPED FOR ICE TO

SHIP SAMPLES RETURNED TO MOTEL.

1710 BEGAN PROCESSING SAMPLES COLLECTED TODAY. SHIPPED (2)

TWO COOLERS TO LAB FOR ANALYSES TOOK A BREAK FOR

DINNER AND RETURNED TO FINISH TASK.

2115 CLOSED LOGBOOK. Tracy L. Thompson

TLT

OCT. 5, 1995 WTHULSDAM

-R75 0700 WCC CREW MET FOR BREAKFAST DLS HELD HEALTH AND SAFETY MEETING.

1 0800 THT AND EJT TOOK EQUIPMENT RINSEATE = W0007-EQUIPRIN. THT WENT OVER LOGBOOK WITH EJT. THT PROCESSED AND LABLED PARTICLE SIZE SAMPLES.

4

3) 1015 TURNED LOG BOOK OVER TO EJT

0930 WCC crew arrived at boat ramp and loaded boat. Headed to area 2.

1-R700 0953 Arrived at transect 1 area 2 125' out. No sediment found moved in - no sediment found.

EJT 1002 1004 Finished Area 2 transect 1

2 1005 Area 2 transect 2 - checked for sediment. No sediment found.

1007 Checked EJT ~~remaining~~ transects (3-6) in area 2. No sediment found in transects 3-6 of area 2.

1018 Arrived at transect 7, marked 100' out; Marked transects 8 and 9.

1029 Began sampling at transect 9, 75' out. TL 1st core: 24"; TL 2nd core: 18"; took S009B-02-R700 MS/MSD from 6-24" S009A-02-R75; S009B-02-R75

1053 Finished at transect 9

1055 Transect 8, 0-25' out S008A-02-R00 S008B-02-R00 Took core samples and particle size. TL 1st core: 14"; TL 2nd core: 16"; TL 3rd core (ps): 12" Area 2 transect 8 (ps) TW = 443g (0-6") (6+") TW = 406g

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1113 Deconed equipment. Finished at transect 8

1115 Arrived transect 7, 100-125' out

took ponar sample. S007A-02-R100

1121 Finished at transect 7

1127 Arrived Area 3, Remarked shore locations for transects 1 & 2, 300' apart

1140 Took lunch break

1235 Arrived Area 3 transect 5, marked 50' out.

Took ponar sample and MS/MSD. S005A-03-R50

1303 Finished transect 5 S005A-03-R700

1305 Arrived transect 4, marked 100' out

Took ponar sample. S004A-03-R100

1313 Finished transect 4

1315 Arrived transect 3, 0-25' out S003A-03-R00
S003B-03-R00

Took core samples and particle size

TL 1st core: 17.5"; 2nd core TL: 20"; TL 3rd core (ps): 24"

Area 3 transect 3 0-25' 0-6" TW: 641g

0-25' 6+" TW: 1517g

Took HNu reading. Background 1.2 ppm

0-6" = 2 ppm (0.8 above background)

6+" : 1.6 ppm (background also 1.2 ppm = 0.4 ppm above background)

1326 Finished transect 3.

1340 Arrived transect 2

Began sampling 75' out.

Took ponar sample. S002A-03-R75

Deconed equipment.

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1350 Finished Area 3 transect 2.

1355 Arrived transect 1, 100' out

1358 No sediment found 100' out, moved in to 50'.
Sediment found at 50'. Ponar sample taken. S001A-03-R50

1412 Finished Area 3 transect 1.

1455 Arrived boat ramp - pulled out boat

1513 Left dock for hotel stopped for gas and ice

1539 Arrived at hotel, unloaded equipment and sumples.
Prepared samples for shipment. Shipped 3 coolers.

~~1600~~ 1700 Fed-Ex pickup at hotel. (1 cooler samples from 10/5,
2 coolers sumples from 10/4 and rinsate)

1900 Closed log book. Elizabeth J. Iser

EJI

Oct. 6, 1995 Friday

0700 WCC crew met for breakfast. BL Held Health and Safety meeting.

0815 JR and BL took rinsate sample: W008-Equiprin

0835 WCC crew planned day's strategy

1023 Loaded boat by area 3

1036 Headed to area 7. LT + TOH marked the shore line, 300' apart. BL + JR set up GPS unit.

1108 Crew went back to turn off GPS unit. GPS points could not be shot because of lack of satellites.

1219 Arrived area 6, 1st location.
Pulled ponar sample and particle size. S001A-06-R00
Turned on GPS unit while going to area 6.
Number of satellites adequate. (TW-jar 1: 236g; TW-jar 2: 253g) > 459g
GPS reading 6-1-25, 2051 + 2052.

1230 Finished 1st location.

1233 Arrived 2nd location, marked position 200' inside of wall. GPS reading 6-2, 2053 + 2054
Took core samples, MS/MSD (6-24") S002A-06-R00 S002B-06-R00 S002B-06-R00
TL #1: 16"; TL #2: 24"
HNu reading core #1 6-24". background: 2 ppm
reading: 2 ppm.

1258 Finished at 2nd location

1300 Arrived location 3, 50' inside of wall.
GPS reading 6-3, 2055 + 2056
Took core samples

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TL 1st core: 24" ; TL 2nd core: 24" S003A-06-R00 S003B-06-R00

1323 Finished location 3 area 6.

1338 Arrived area 7 transect 3, 0' out.

Took GPS reading 7-3-0, 2057 + 2058.

* 1342 Moved to transect 2, marked 75' out.

Took GPS reading 7-2-75, 2059 + 2060.

* 1345 Moved to transect 1, marked 75' out.

Took GPS reading 7-1-75, 2061 + 2062.

1359 Arrived area 2 transect 7.

Took GPS reading 2-7-100, 2063 + 2064

1401 Moved to transect 8. GPS 2-8-0, 2065 + 2066

1404 Moved to transect 9 - GPS 2-9-75, 2067 + 2068

1408 Arrived at area 3 transect 1 to read GPS.

GPS reading 3-1-50, 2069, 2070, 2071

1412 Moved to transect 2, 3-2-75, 2072 + 2073

1414 Moved to transect 3, 3-3-0, 2074 + 2075

1417 Moved to transect 4, 3-4-100, 2076 + 2077

1420 Moved to transect 5, 3-5-50, 2078 + 2079.

GPS readings have been taken for areas 2, 3, 6 and 7.

1433 Turned off GPS reference unit.

1443 Arrived area 7 transect 3, 0' out - No sediment.

* 1451 Arrived transect 2, 75' out. No sediment found, moved in to 25' out. Took ponar sample. S002A-07-R25

1503 Finished at transect 2.

* 1504 Arrived transect 1, 75' out. No sediment found,

Oct. 6, 1995 (con't) Oct.

moved in to 50' out. Took zoner sample and particle size, TW jar 1: 230g; TW jar 2: 237g (467g) S001A-07-R50

1521 Finished transect 1 area 7. Headed to boat dock to load boat.

1540 Headed for hotel, stopped for ice and gas.

1556 Arrived hotel unloaded boat, samples and equipment.

1604 Began processing samples and prepare them for shipment.

1700 Shipped one cooler to lab. (Fed-Ex pick up at hotel front desk)

1730 Closed log book. Elizabeth J. Lee

EJL

Oct. 7, 1995 Saturday

0830 WCC crew met for breakfast. BL held Health & Safety meeting.

07-R50

1030 Picked up field supplies

1145 Unloaded boat a boat ramp and headed for the Reference area.

1205 BL + TDH marked transects 4-7. JR & EJT marked transects 1-3.

1330 BL, TDH, JR & EJT began marking distance out per transect.

Transect 7 - 100' out (marked at 75' out)
6 - 125' out
5 - 75' out
4 - 0' out
3 - 50' out
2 - 75' out
1 - 25' out

1430 Met up with muscle dive crew. BL went with them to shoot GPS pts.

1503 Two members of dive crew, Bobby Chaffin and Debbie Bennett, got on boat with sediment crew and headed for boat ramp

1536 Arrived boat ramp and loaded boat.

1553 ~~1753~~ Arrived hotel, unloaded equipment.

1715 Closed Log book. Elizabeth Jen

EJT

C Oct. 8, 1995 Sunday

1000 WCC crew met for breakfast. BL held health & safety meeting.

1040 ~~EST~~ EJT Left hotel for boat ramp.

1053 Arrived boat ramp, loaded equipment and offloaded boat.

1123 BL downloaded GPS reference and rover units.

1128 BL, JR, TDH & EJT headed to reference area. Stopped to turn on GPS reference unit.

1158 Arrived reference area transect 7, 100' out
Probed for sediment. Took ponar and S007A-OR-R100
particle size samples, Tupjar 1: 236; Tupjar 2: 250 = 486g

1210 Finished transect 7.

1215 Arrived transect 6, 125' out
Pulled ponar sample. S006A-OR-R125

1228 Finished transect 6.

1232 Arrived transect 5, 75' out.
Pulled core sample. TL < 3", TDH decided to
pull ponar sample. S005A-OR-R75

1243 Finished transect 5.

1246 Arrived transect 4, 0' out.
Pulled core sample and VOC (0-6" and 6+") S004A-OR-R00
TL 1st core: 18"; TL 2nd core: 16"; TL 3rd core: 12" S004B-OR-R00

1309 Finished at transect 4.

1312 Arrived transect 3, 50' out
No sediment at 50', moved in to 25'.
Pulled core samples

Oct 8, 1995 (con't)

TL 1st core: 6"; TL 2nd core: 6" S003A-OR-R25

1334 Finished transect 3

1338 Arrived transect 2, 75' out.

Probed for sediment, none found. Moved in to 0' - No sediment found, no sample taken.

EJT
~~FDH decided~~ BL took GPS pts. R-2-25 - 2300, 2301

TDH decided to take a discretionary sample 150' downstream of transect 2. Pulled ponar S01DA-OR-R00 sample. Took GPS reading, R-01D 2302, 2303

00 1355 Finished with discretionary sample.

1400 Arrived transect 1, 25' out. No sediment, moved in -0'. Pulled ponar sample and particle size. S001A-OR-R00

GPS reading R-1-25, 2304, 2305 PS: TW jar1: 207, TW jar2: 211 41.3g

1410 Finished transect 1

1413 Took GPS reading at transect 3, 25' out - R-3-50 pts. 2306 & 2307

1415 Took GPS reading at transect 4, 0' out - R-4-0, 2308 + 2309

1419 Took GPS reading at transect 5, 75' out - R-5-75, 2310 + 2311

1425 Took GPS reading at transect 6, 125' out - R-6-125, 2312 + 2313

1434 Took GPS reading at transect 7, 100 out - R-7-100, 2314 + 2315

R00 1436 Turned off and broke down reference unit.

R00 1458 Headed to ~~boat~~ ramp to load boat + samples.

1530 Arrived at hotel, after stopping for ice + gas, unloaded equipment and samples.

1548 Began processing samples and prepared them for shipment.

Oct. 8, 1995

1655
~~1605~~ Filled out chain of custody (EJT). TDH took two (2) rinsate samples. Packed samples on ice, ready to ship out on Monday, Oct. 9, 1995.

2000 Closed log book. Elizabeth J Teer

EJT

Oct. 9, 1995 Monday

0700 WCC crew met for breakfast. DLS held a health and safety meeting.

0745 TDH took JR to the airport. BL + EJT assessed the number of water sampling vessels.

0830 TDH returned to the hotel. TDH, BL + EJT changed out equipment in the boat, from sediment sampling equipment to water sampling equipment.

1015 TDH & BL put together water sampling "Kits" - sampling vessels per location. EJT took total weights on particle size samples from 10/6/95 and 10/8/95.

1130 Went to get field supplies & lunch.

1250 Prepared samples collected on 10/8/95 for shipment, i.e. ice bags. Called FedEx for a hotel pick-up.

1320 Headed for boat ramp.

1343 Offloaded boat and headed for reference area to collect water samples.

1407 Arrived reference area. BL + TDH prepared equipment. EJT labeled test vessels.
Began sampling at transect 7. W007-REF-R100
W007-~~REF~~ R100-Dup
-REF-
Total depth 6.5'. Samples will be pulled at 0', 3' and 6'. The VOC samples were taken from the middle depth (3'). Also took a duplicate sample.

1520 Finished transect 7, deconed equipment.

1533 Arrived transect 6.
Total depth 7.5'. Samples will be taken at 0', 3.5' and 7'. VOC samples were taken from

EJT

Oct. 9, 1995 (con't)

the middle depth (3.5').

1546 Finished pulling water sample and headed for the boat ramp. While motoring toward the boat ramp, the 10 gal. aquarium broke and the water sample was lost. Sample taken at transect 6 will be discarded and re-sampled. Transect 6 also MS/MSD sample.

1605 Arrived boat ramp. loaded boat, went for supplies.

1720 Arrived at hotel, unloaded sample, placed sample on ice.

2100 Closed log book. Elizabeth J Jen

EJJ

Oct. 10, 1995 Tuesday

0700 WCC crew met for breakfast. DLS held health and safety meeting.

0740 Prepared samples taken 10/9/95 (W007-REF-R100, W007-REF-R100-Dup) for shipment. Made labels, wrapped vessels in bubble wrap and placed in ziplock. Placed ice over samples and FedEx labeled.

0930 Called FedEx for hotel pick up.

1017 Arrived at boat ramp, offloaded boat and equipment.

1029 Headed to reference area transect 6 to resample, (125' out).

1100 Total depth at transect is 7.5'
Samples taken at 7', 3.5' and 0' deep.
VOC samples ~~taken~~ EST taken from the middle depth (3.5').
MS/MSD samples taken at transect 6. W006-REF-R125
W006-REF-R125-MS
While waiting for samples to filter, jars were W006-REF-R125-MSD
labeled for transect 5.

1151 Finished transect 6.

1155 Arrived at transect 5, 75' out
Total depth 1.5'. All samples were taken from the same depth (1.0'). VOC samples taken from 1.0'. W005-REF-R75

1216 Finished transect EST 5.

1221 Arrived at transect 4, 0' out.
Total depth 1'. All samples taken at 0.5' W004-REF-R00

1239 Finished transect 4.

EAJ 1245 Arrived at transect 3, 25' out.

Oct. 10, 1995 (con't)

Total depth 2.0'. Samples will be taken at 1.0'
VOC also taken at 1.0'.

1250 Headed back to boat ramp. Samples will be filtered once we reach the hotel.

1315 Loaded boat. Placed container with water from transect 3 inside suburban.

1330 Arrived back at hotel. TDN & BL offloaded samples. EJT prepared to leave. EJT signed log book over to BL. Elizabeth J Jeer.

1430 BL took EJT to the airport. EJT was beside herself to get back home to her honey.

1500 Filtered W003 - REF
Printed out labels for all the samples.
Labelled samples collected during the day.
Prepared PAH and PCB blanks.

1600 Purchased supplies at CUB foods.

1900 Closed log book.

Oct. 11, 1995 Wednesday

0700 WCC crew met for breakfast. DLS held health & safety meeting.

0740 Processed samples taken 10/10/95. Prepared samples for shipping. Put ice on samples. Completed Chain-of-custody forms. Contacted Federal Express for pick-up at the hotel. Did planning for GPS & mussel transects.

1000 Prepared sample kits for water collection.

1100 Departed hotel for work site.

1130 Arrived @ boat ramp. Offloaded boat & equipment. Weather: Clear, sunny, light wind low 80's. River conditions: Small waves due to light wind. Flow is much stronger on the river today than it normally is. Flow is "turned up" at the locks.

1157 Arrived @ W006-02-R110 for recollection of sample. Composite from three depths was taken. Water depth 15'. Samples @ 14½', 7', & surface.

1202 Filtering of Sample W006-02-R110. Two filtered and two unfiltered for lab tests of PAHs.

1212 Completed filtering of W006-02-R110.

1215 Arrived @ W004-02-R10 and collected sample. Depth 3½ feet. Composite sample @ 3', 1½', & surface.

1217 Filtered sample W004-02-R10.

1225 Completed filtering of sample W004-02-R10

Oct. 11, 1995 (cont)

Oct

1230 Arrived at W001-03-R110.
Pulled a composite sample at: 12½', 6½', & 0'. Depths
1235 Began filtering W001-03-R110. Two jars filtered two unfiltered for lab analysis of PAH.
1246 Completed filtering of W001-03-R110.
1250 Arrived at W005-03-R50.
Collected a composite sample @ Depths: 10', 5', & surface.
1253 Filtered a sample for Metals analysis.
1259 Completed filtering sample W005-03-R50.
1307 Loaded up boat at Area 3 dock.
Drove to hotel. Deposited samples in hotel room. Loaded sample kits onto Suburban.
1325 Departed hotel for the river.
1340 Arrived at dock. Loaded the barge w/ coolers of sampling supplies. Motored to Area I.
1350 Arrived at W016-01D-R50.
Collected composite sample @ depths:
1353 Filtered sample W016-01D-R50.
1355 Traveled up the shore to observe condition of the outfalls.
1400 Outfall 001 was not flowing. No water sample taken.
Outfall 002 was not flowing. No water sample taken.
Outfall 003 was not flowing " " " "
Outfall 004 was flowing. Sample to be collected later.

Oct. 4, PM5 (cont.)

Outfall 005 was not flowing. No sample to collect.
Outfall 00C was flowing. Water sample previously collected

1410 Arrived at W001-01A-R60. Collected composite sample and filtered. Sample was collected in jar and preserved w/ Nitric Acid and will be analyzed for metals.

1420 Arrived at W001-01A-R160. Collected composite sample and filtered. Sample collected for metals analysis.

1425 Motored to the reference area and transect 2.

1428 Collected sample at R-2. W002-REF-R75
~~Depth~~ Depth of Water 11'
Samples at 10', 5' and surface
VOCs taken from middle depth at 5'

1430 Sample(s) at R-2 were filtered.

1455 Completed filtering R-2

1500 Arrived at R-1. W002-REF-R25
Depth at 6' Sample pulled @ 5 1/2' 3', & surface
VOC samples collected at 3' depth.

1510 Began filtering at R-1

1540 Completed filtering of R-1.

1545 Motored to Outfall 004.

1600 Arrived at Outfall 004.
Depth is 1 foot. Sample collected at mid depth.
VOCs collected at ½ foot.

1610 Filtered O-4 Sample: W0010-01C-R10

(Oct 11, 1998) (cont.)

1620 Motored to ramp while fishing.

1630 Removed boat from ramp. Drove to hotel.

1715 Returned to hotel. Unloaded samples from the barge and transported them for storage at the hotel. Placed samples on ice.

1730 Closed log book.

Oct. 12,
070
074
080
114
121
130
13
13
13
13

Oct. 12, 1995 (Thursday)

0700 WCC crew met for breakfast. DLS held health & safety meeting.

0740 Downloaded the GPS data from the transect shooting of Oct. 11, 1995 that indicated the mussel study transects.

0805 Prepared labels, labelled, iced, prepared & completed chain-of-custody forms for samples collected 10/11/95. Called Federal Express for a pick-up at the front desk at the hotel.

1140 Prepared Fed Ex labels and attached them to the shipment coolers Transported shipment coolers to the front desk for shipment.

1215 Loaded Suburban & barge. Drove to Lock & Dam 14.

1300 Put barge in at Lock & Dam 14. Motored to Pigeon Creek.

1310 Arrived at Pigeon Creek. Decon'd sampling equipment.

1315 Extracted first sediment core.
core #1: TL = 21"

1321 Extracted Second sediment core.
core #2: TL = 21"
collected samples:
core #3: TL = 24"

1338 Water Sample at Pigeon Creek:
Total Depth is 2' deep.

Oct. 12, 1995 (cont.)

composite water sample taken @ 1' deep
VOCs taken at 1' depth.
1340 Began filtering sample PC (Pigeon Creek)
1406 Completed filtering of sample PC.
Motored to Crow Creek.
1420 Determined best way to sample Crow Creek
1445 Collected water sample at Crow Creek.
Depth of water 2'. Composite sample
at 1'. Sample id:
VOCs @ 1'
1450 Collected sediment samples
core #1: 18" total length.
core #2: 14" " "
core #3: 13" " " for particle size
core #4: ~~14"~~ 16" " " for particle size.
~~1505 Bog R~~ Samples:

1505 Began filtering of water sample CC (Crow Creek)
Sample:
1525 Completed filtering of sample CC
1533 Departed Crow Creek for boat ramp
Weather today: Sunny, no clouds, strong wind 80's
1603 Arrived at lock & dam 14. Loaded barge.
Headed towards the hotel.
1705 Arrived at hotel, unloaded coolers with samples.
1730 closed log book. Tracy Long

Oct 13,
07
08
0
0
0
10

Oct 13, 1995 Friday)

0700 WCC team met for breakfast and made plans for work for the day. DLS held health & safety meeting.

0800 Prepared sample kits for the day. Discussed w/ Carl Crane the latest sampling / discretionary sampling locations.

0900 Purchased field supplies at Cub Foods.

0930 Launched barge from dock. Traveled to Area 1. Weather: Sunny, clear, light wind., temp in low 70's, to get to low 80's. Motored to Area 1B, between transect 4 & 5) and 20' from shore.

0950 Collected sample: S004,5A-01B-R20 Sample was collected with a ponar. Duplicate sample collected.

1002 Crow Creek (CC) sample extracted from coring tube (From yesterday) and placed in zip lock bags. Core length was 16". 0"-6" was placed in bag labelled "CC-A" and the 6" to 16" was placed in bag labelled "CC-B".

1006 Pigeon Creek sample was extracted from sampling core. Total length = 24": 0"-6" was placed in bag "PC-A" and 6" + into bag "PC-B". These samples will be weighed and used for particle size.

1015 Decon'ed equipment (sampling equipment)

Oct 12, 1995 (cont.)

1025 Motored to Area 1B between transect 3 & 4 searched for best place to collect sample.

1030 Sediment was approximately one foot deep. After attempting to core it was found that a core device would not collect the sample. A power was used to collect the sample.

1031 Sample: SOO3.5A-01B-R30 was collected. Sample and duplicate sample were placed in sample jars.

1040 Sampling equipment was decoved.

1045 Motored to Area 1B, between transects 2 & 3. After probing it was found that there was only about 3" of sediment in the area. A power was used to collect the sample.

1055 Sample SOO2.5A-01B-R20 was collected with the power. Duplicate was taken. Sediment was about 8" deep but there was no recovery beyond 6".

1105 Decoved Sampling equipment

1125 Motored to Area 1B between transect 1 & 2. Power was used to grab samples. No sediment could be found at 100' out from the shore.

1130 Sample SOO1.5A-01B-R10 and a duplicate were collected with a power and 50' from the shore

Oct. 1
114
114
115
12
K
+
AREA 1B

Oct. 13, 95 (cont.)

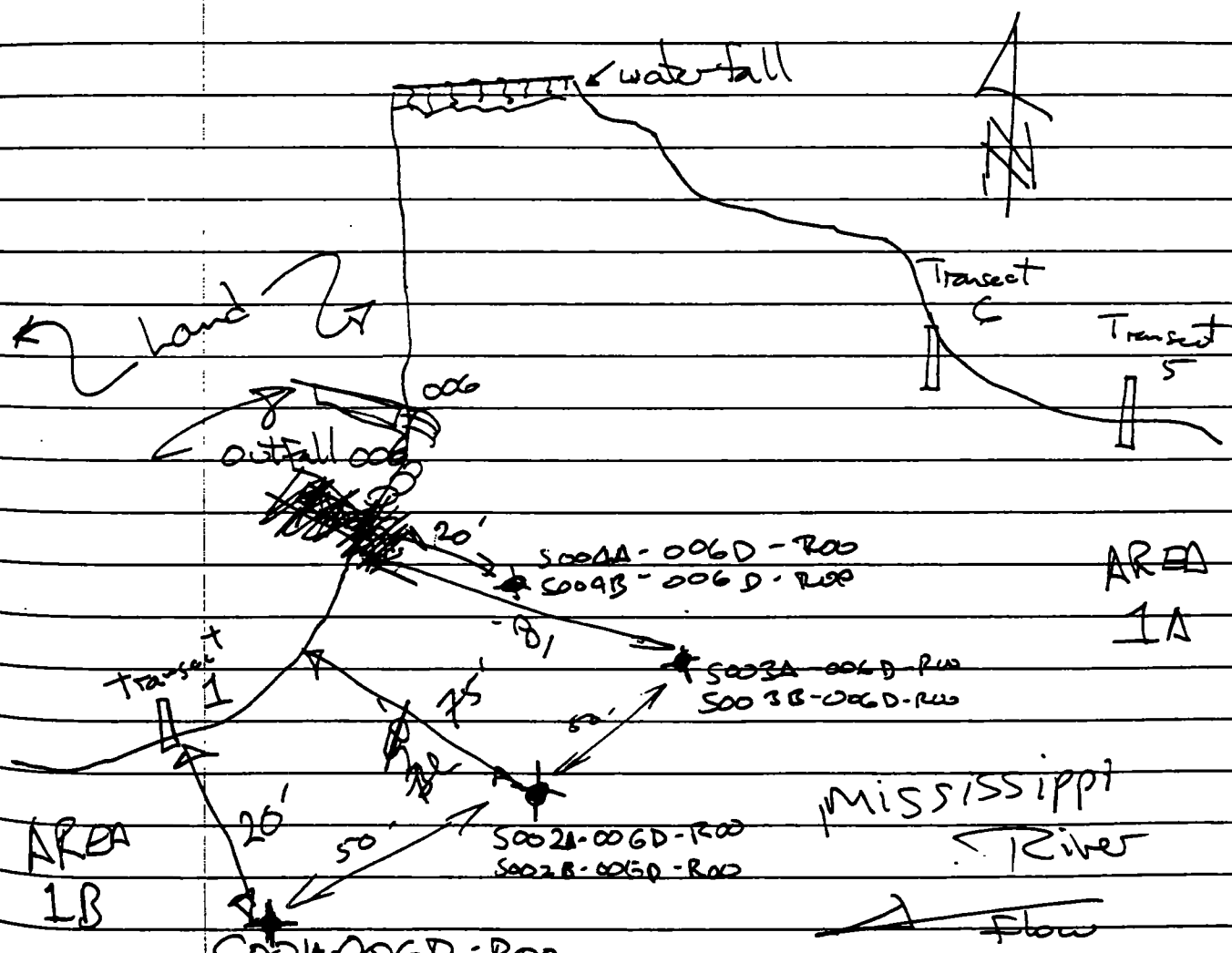
1140 Deconed sampling equipment.

1145 Motored to Outfall 006.

1150 Collected Sample ~~S006~~ S001A-006D-R00. Sample jars labelled C-1A
Flow was approximately 7" of sediment over rock in the sampling location. Duplicate taken. Sample taken w/ a ponar.

1200. Deconed sampling equipment.

Sketch of Area at Outfall 006



Oct. 13, 95 (cont.)

1210 Set up at next sampling location

1215 Sample S002-006D-R00 was collected with a drive tube. Total length of core was 18".
Core # 2, TL = 24".

1220 Sample S002A-006D-R00 and S002B-006D-R00 and S002B-006D-R00-DUP were collected in jars. Jars labelled 6-2A, 6-2B, & 6-2B DUP.

1235 Decon'd sampling equipment.

1240 Sample S003A-006D-R00 was collected w/ a push rod.
Core # 1 TL = 20". First core had a layer of wood and a layer of rock.
core # 2 TL = 24".

1250 Samples S003A-006D-R00, S003B-006D-R00, and S003B-006D-R00-DUP were placed in sample jars.

1302 Moved into position for 6-4A & 6-4B.

1305 Samples S003A-006D-R00, S003B-006D-R00, and S003B-006D-R00-DUP collected w/ a coring device.
core # 1 TL = 22"
core # 2 TL = 6"
samples placed in sampling jars.

1325 Decon'd equipment. Moved away from Outfall 006.

1330 Set up for GPS at sampling location.

Oct. 1
13
14
14
14
15
15
16

Oct. 13 '95 (cont.)

1345 Sample S004.5A-01B-R20 GPS pts: N/A
" S003.5A-01B-R30 " "
" S002.5A-01B-R20 " "
" S001.5A-01B-R50 " "
" S001A-006D-R00 " "
" S002A-006D-R00 " "
" S003A-006D-R00 " "
" S004A-006D-R00 " "

1430 Could not GPS anything. Stupid rover unit wouldn't pick up any satellites. Would like to throw it in river

1431 Motored to dock.

1445 Loaded barge. Departed Dock.

1500 Went to Wal-Mart for field supplies.

1540 Unloaded barge and secured sampler in hotel.

1600 Closed log book.

Oct. 14, 95 Saturday

Winds @ 30 mph +. High water. Temp 30's & 20's.
Could not work on water this day.

Oct. 15, 1995 Sunday

0830 DLS and BC met for breakfast, had a health and safety meeting; then went out to the water for velocity measurements.

0900 TDH, BL, and DB met for breakfast, discussed sampling activities for the day; held a health + safety meeting.

1000 Assembled sampling kits and coolers.

1020 Loaded barge. Put gas in barge tanks. Purchased supplies

1100 Loaded barge into water.

Weather: Sunny, clear, 50's, windy.

11:26 Sample S001D-02-R25 - collected w/ ponar
Collected S001D-02-R25-DUP (25' from shore at water intake)

11:34 Decon sampling equipment

11:39 Motored to take Core sample upstream Area 2

11:45 Pulled core - less than enough S002D-02-R25-DUP S002D-02-R25

11:50 Sample 2-2D-A & 2-2D-A-DUP collected w/ ponar
Only collected from 0-6" - Jars were labeled

11:56 Decon equipment - sampling was done 25' offshore upstream from area 2 by fleeting facility tank farm

12:03 Motored upstream to Duck Creek to collect particle size analysis sample downstream of railroad bridge

12:18 Arrived @ location.

12:20 Packed sample jars. 2-4oz. jars - labeled DC-PS

12:22 Decon equipment 12:32 = Move to transect
Sample location 200 ft. extending from transect
located approx. 40' downstream duck blind

12:39 Collected discretionary samples S010AD-VB-R200
Samples labeled ID-10-A and ID-10-B DUP
Pulled w/ core device - 1st core total length 26"
2nd core length = 24"
13:04 Completed filling jars
13:08 Equipmt. decon finished
13:10 Moved upstream transact approx 175' off shore for discretionary sampling
13:13 Collected samples S011AD-VD-R175
Size 8" Collected w/ ponar
13:18 Labeled jars ID-11 and ID-11-DUP
13:27 Samples finished - decon in progress
13:40 Moved to bank for potty break
13:59 Motored to take S012AD-VD-R200
downstream approx 125' of transact
14:02 Collected discretionary samples w/ ponar
Labeled ID-12 & ID-12-DUP (approx 200' offshore)
14:10 Decon completed & arranged barge to motor to dock
14:15 Headed to dock
14:26 Arrived @ dock - loaded barge
14:30 Departed for hotel

ALCOA - Y1
Davenport

Field Book
115300

95N016
Mussel Studies

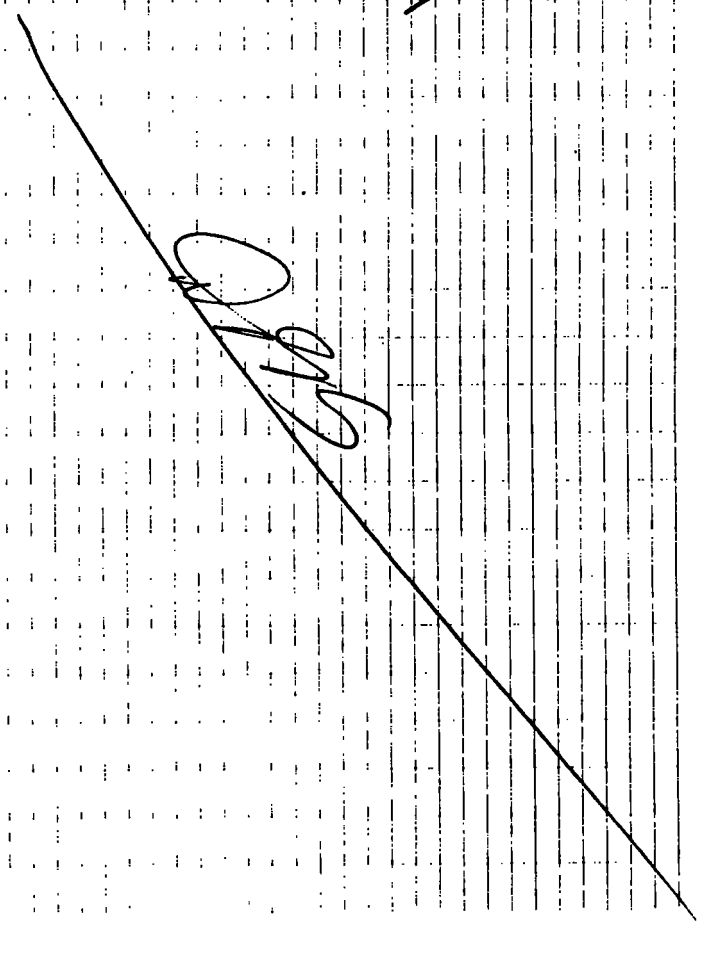
CONTENTS

PAGE NO.	REFERENCE	DATE

9-19-95 overcast / Rain

0700 met for Breakfast, discussed Safety problems

Boat Lower unit went out, NO Work for day

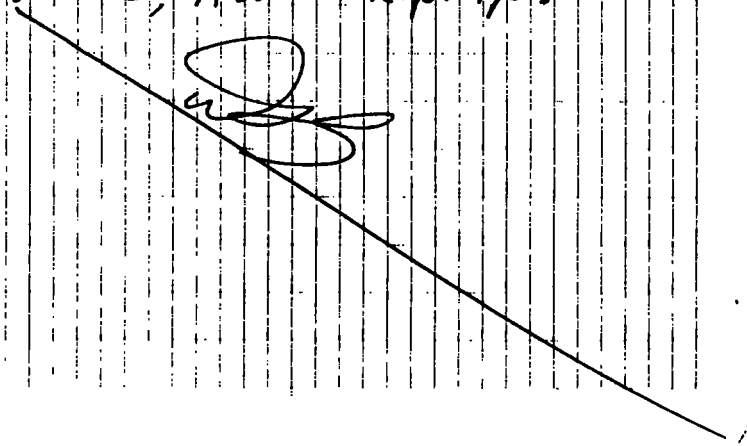


9-3095 cool/overcast

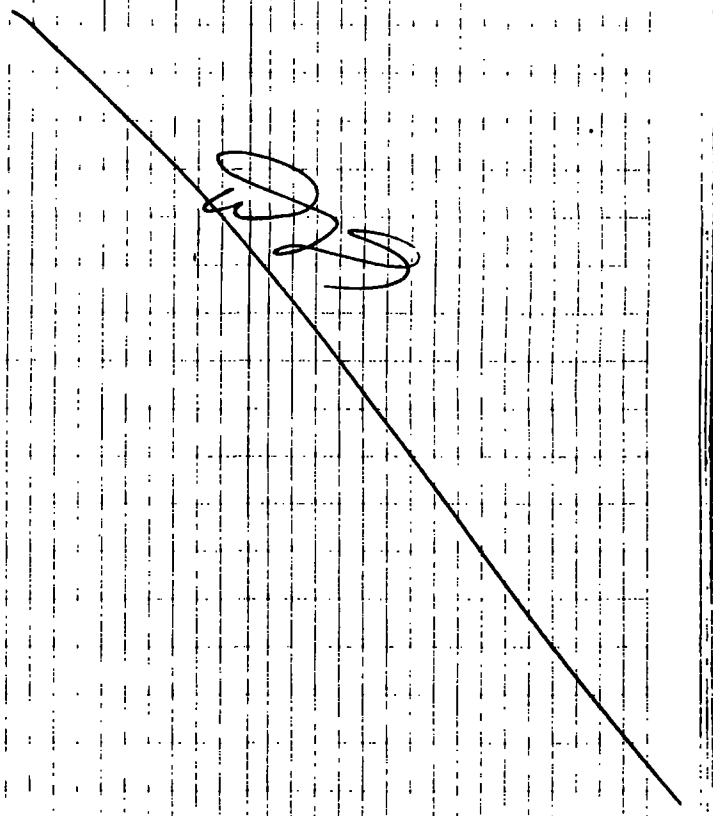
0730 Breakfast, Safety meeting held.
0830 picked up Boat new Winch installed at Ramp.
Hydro Survey on Area 3.

- Mallards
- Coots along Rock Island.
- GBH's very common
- Redwings along Banks

While getting Turnaround location for Area 2 Gray Fox seen on North Bank. Run along fence, Above Riprap.



9-21-95 Rain / cold
0700 Breakfast + H-S
GPS day on River.
As we will be on shore
it was advised we be
careful along w/ pumps
NO problems



9-22-95 cold/windy

0700 met for Breakfast
advised we needed extra
clothing. Geacock H.S.

SX 2822.126.
SY 56850

TX 2818965
TY 567997

9/23/95 sunny/cool

0700 Breakfast & H+S meeting

0945 In Area / Awaiting B.L. to get survey equip. setup
Osprey seen over River.
- Several GBH's
- Bank Swallows common.

3 ospreys in site over Plant.
- Tern seen fishing
- A few coots seen
- Seagulls common

9-24-95 Clear/cool

0930 met for breakfast.
H+S meeting with TH+BL
Water sampling

@1730 Rain storm Hit

9-25-95 Sunny/Warm

0700 Breakfast & Hot Sweets
morning speech on Sample
kits & Bagging supplies
1045 on water, Samples

9-26-95 Sunny/clear
0700 Breakfast 2 HES
meeting
3rd Cuzco plus MG.
Present
0930 on water
1530 setting up GPS unit

9-22-95

@JS too sick to go acct.
Intestinal Flu
Barry Haskell to take acct

9-28-95

0700 All but J.R. met for Breakfast. JR down with Same Flu DCS Hard, Safety Briefing held.

DCS stayed in, too weak to go out.

9.29-95 overcast/windy

0700 Breakfast. JR still out

0800 Meeting held in TDH Room. H&S concerns & keep from. None were evident.

9-7095 Warm/clear

0700 Breakfast at Motel

H2S concerns discussed.

Alcon reports that hardhats, Steel Boots & Safety glasses be worn at all times on property will need about to set Reference unit for GPS.

1100 Work halted due to Thunder storm & Lightning

10-1-95 Sunny / windy

1030 met in parking lot to go to JOS site. H2S concerns addressed as new ones brought up.

1140 - Sharp shivered Hawk over IC area.

10-2-95 Sunny/warm

0700 Met for Breakfast
H+S concerns discussed
BL will cover H+S if
I'm with Mussell crew
in next few days
0900 Mussell crew cleaning
Trash from Boat. Setting
Ropes etc.

10/03/95

0950 – Reagan transect
conditions: Cloudy cool day.
Water only turbid slightly.
All mark but 25 ft.
only Franklin relict Amblema
plicata 7.9 cm 10x9.
Quadrat 2, 2 left & Right
TRANSECT 1

Quadrat 2
#1 Truncilla relect
Proptera alata relect
Proptera alata relect
Ligumia recta relect
34 ft. Anodonta grandis relect
Anodonta grandis relect
Proptera alata relect II
Sphaeriidae relect
Obliquaria reflexa relect
Quadrula nodulata relect
Amblema plicata (rel) II
Quadrula quadrula relect
Quadrula pustulosa relect
Cyclonaias tuberculata relect

Quadrat 2
#2 Proptera alata relect
34 ft. Amblema plicata relect

10/03/95

Quadrat 2 — continued

Ligumia recta relict
*2 Proptera alata relict
Megalonaias gigantea relict ||
6 ft. Quadrula metanevra relict
34' Quadrula nodulata relict ||
Lampsilis teres relict
Anodonta grandis relict
Quadrula pustulosa relict ||
Pleurobema cordatum relict
Obliquaria reflexa relict ||
Cyclonaias tuberculata relict
Quadrula quadrula relict
Truncilla truncata relict

Quadrat 3

*1 Dreissena polymorpha (numerous)
Amblema plicata relict ||
6 ft. Proptera alata relict
5' Fusconaia flava ebena relict ||
Sphaeriidae relict
Quadrula pustulosa (rel.) ||
Truncilla truncata relict
Ligumia recta relict
Megalonaias gigantea relict
Leptodea fragilis relict

10/03/95

Quadrat 3 — continued

*1 Fish two vms
leech
6 ft. Chironomidae
5' Pleurocera relict

Quadrat 4

*1 (right) Amblema plicata relict ||
Lampsilis ventricosa cardium relict
Quadrula nodulata relict
Batter temp Amblema plicata live 11 3 cm-L 8.1 cm-H 5 years
66° F Proptera alata relict 5.4 cm-L 4 cm-H 6 years
Elliptio dilatata live 9.3-L 6.8 cm-H 10 years
8' Quadrula quadrula live
Quadrula pustulosa ||||
Quadrula quadrula relict
Lasmigona complanata live 7.8 cm-L 11.7 cm-H 12 years

Quadrat 4

*2 (left) Megalonaias gigantea relict ||
Amblema plicata relict ||||
8' Quadrula pustulosa relict |||
68' Fish (Stoneroller) live
Leech live
Fletworm live

10/3/95 Sunny

Quadrat 4 continued

#2 (left) Ligumia recta relict
Proptera alata relict

85' 68' H

Quadrat 5 10/3/95 12:50pm Partly Sunny 68°F

#1 (right)
Quadrula quadrula live 3.96cm-H 4.43cm-L 6 years
Quadrula pustulosa ||| relict

136' 95' H

Quadrat 5 Water temp 59°F (9 ft)

#2 (left) Quadrula pustulosa relict |||
Dreissena polymorpha (numerous)
Lampsilis cardium relict ||
Amblema plicata relict ||| |||

136' 95' H

Quadrula quadrula relict ||
Leptodea fragilis relict ||
Fusconaia flava relict
Pleurocera live
Amblema plicata live 8.52-L 6.73+H 11 years
Quadrat
Megalonaias gigantea live 5.12cm-H 7.33cm-L 5 years
Truncilla truncata relict
Megalonaias gigantea live 11.9cm-L 8.46cm-H 10 years
Megalonaias gigantea live 12.4cm-L 8.53cm-H 11 years

Quadrat 9 #1 (left)
Quadrula quadrula live 7.94cm-L 6.64-H 11 years
Quadrula quadrula live 6.47-L 6.48-H 9 years
Quadrula pustulosa relict |||
Cumberlandia plicata relict ||||
Amblema plicata relict ||| 8.08cm-L
Amblema plicata live 6.64+H 10 years

157' 136' H

Megalonaias gigantea relict || 8.0cm-L
Quadrula metanevra live 6.38cm-H 10 years
Leptodea fragilis relict
Quadrula nodulata relict
Fusconaia flava relict 6.77cm-L
Quadrula quadrula live 5.78cm-H 10 years
Fusconaia ebena relict
Elliptio lineolata relict
Truncilla truncata relict 6.09cm-L
Quadrula quadrula live 5.48cm-H 9 years

Quadrat 10 #1 (left)
(Last stop)
Bedrock w/ fissures - mussels in cracks 6.3cm-L
Leptodea fragilis live 3.9cm-H 4.28cm-L 4 years
Quadrula pustulosa live 4.19cm-H 6 years
Amblema plicata live 8.5cm-L 7.0cm-H 12 years

187' 152' H

Amblema plicata relict ||| 8.69-L
Elliptio lineolata live 6.19-H 7 years
Megalonaias gigantea 9.17cm-L
Amblema plicata live 6.78cm-H 9 years
Amblema plicata relict

10/3/95 Sum

Quadrat 10 m²

*2 (left)
- Truncatella truncata relict
- Leptoxis bracteata relict
- Quadrula pustulosa relict III
- Strophitus undulatus live 8.9cm-L 4.85-H 8 years
- Quadrula pustulosa live 4.0cm-L 4.0-H 6 years
- Quadrula pustulosa live 4.46-L 4.16-H 6 years

Quadrat 12

*1
- Dreissena polymorpha (diver estimated 100-200 per m²)
- Obliquaria reflexa relict

Quadrat 13

*1
- Amblema plicata relict III
- Quadrula pustulosa live 5.37cm-L 5.18cm-H 7 years
- Ellipsaria lineolata live 4.12cm-L 3.2cm-H 4 years
- Quadrula pustulosa relict II
- Quadrula nodulata pustulosa live 6.41cm-L 5.1cm-H 7 years
- Quadrula pustulosa live 3.72cm-L 3.38cm-H 5 years
- Lasmigona costata (juv) live 2.64cm-L 1.97cm-H 3 years

Quadrat 14

*1 (right)
- Quadrula pustulosa live 3.88 L 3.8 H 5 years

*2 (left)
- Quadrula quadrula 8.92-L 6.87-H 11 years (covered with Dreissena polymorpha)

10/3/95 Sum

Quadrat 17 (2:54 p) 98 ft

*1 (left)
- Amblema plicata relict II 5.06-L
- Quadrula pustulosa live 5.64cm-H
- Quadrula nodulata relict

*2 (right)
- Amblema plicata relict
- Obliquaria reflexa relict
- Cuddeback II
- Fletcher

Quadrat 18 (2:45 p)

*1
- bedrock - 0 mussels / 0 shells

Quadrat 20
- sand substrate

*1
- Quadrat 19 - sand substrate

*1 (right)
- Amblema plicata II relict
- Proptera alata I relict
- Quadrula quadrula relict

*2 (left)
- Quadrula pustulosa relict

10/05/95 notes
used 30 randomly generated number between 1–20 to determine sample sites at 20 quadrat locations. Where necessary 2 samples were taken (up + down) of transect line to obtain 20 total quadrat samples. ca 60 M² per transect.

left = upstream
Right = downstream

sunny 9:15am 10/4/95

Transect 2 500ft upstream from T-1
Random numbers, no. Quad 1

Quadrat 2
1
(left)

	Amerlandia grandis	relict
	Amblema plicatum	relict II
50'	Quadrula pustulosa	relict
	Megalonaias gigantea	relict
	Leptodea fragilis	relict
	Truncilla donaciformis	relict

2
(right)

	Megalonaias gigantea	relict
50'	Leptodea fragilis	relict
	Quadrula pustulosa	relict III
	Corbicula	relict

Quadrat 3
1
(left) 6ft deep 58°F

	Amblema plicata	relict
	Snail	
75'	Obliquaria reflexa	live
	Megalonaias gigantea	relict
	Obliquaria reflexa	relict

10/4/95 Sum

Quadrat 3 con't.

#1

	Quadrula pustulosa	relict	II
75'	~~Obovaria~~ ~~Fusconaia~~ sp	relict	
Alive	Fusconaia ebena		

Quadrat 3

#2 (right)

75'	Quadrula pustulosa	relict	
Alive			

Quadrat 4 96ft 58°F 2-3" silt below clay/bedrock

#1

	Lampsilis cardium	relict	II
108'	Cyclonaias tuberculata	relict	II
Alive	Arcidens confragosus	relict	
	Quadrula pustulosa	relict	IIII
	Megalonaias gigantea	relict	
	A-blema plicata	relict	III
	Leptodea fragilis	relict	II
	Obliquaria reflexa	relict	III
	Truncilla truncata	relict	
	Corbicula	live	
	Quadrula quadrula	relict	
	Quadrula metanevra	relict	
	Quadrula nodulata	relict	

10/4/95 Sum

Quadrat 6 88ft 58°F bedrock/gravel

#1

	Lasmigona complanata	relict	II
	Arcidens confragosus	relict	
150'	Lampsilis teres	relict	II
Alive	Fusconaia ebena	relict	
	Leptodea fragilis	relict	
	Leptodea fragilis	live	
	Dreissena polymorpha	live	
	Quadrula pustulosa	relict	III
	Quadrula nodulata	relict	
	Corbicula	live	
	Amblema plicata	relict	

Quadrat 7 98ft 58°F 4-3-4" sand/silt

#1 (right)

	Amblema plicata	relict	
175'	Quadrula pustulosa	relict	

#2 (left)

	Proptera alata	relict	III
	Quadrula pustulosa	relict	IIII
	Leptodea fragilis	relict	III
	Lampsilis cardium	relict	
	Amblema plicata	relict	III
	Dreissena polymorpha	live (numerous)	

10/4/95 Survey

Quadrat 7 Con't.

200'	Obliquaria	reflexa	live	4.0cm-L 3.0cm-H	4 years
	Quadrula	quadrula	relict	III	
	Truncilla	truncata	relict		
175'	Truncilla	truncata	live	2.9cm-L 2.2cm-H	3 years
	Elliptio	lineolata	live	2.6cm-L 1.78-H 0.74cm-W	3 years

Quadrat 8 9ft 58°F sand/gravel/rock bed

#1 (left)

	Quadrula	pustulosa	relict	II
	Megalonaias	gigantea	relict	
20'	Amblema	plicata	relict	
	Elliptio	lineolata	relict	
	Leptodea	ochracea	live	12.6cm-L 10.48cm-H
	Quadrula	pustulosa	live	2.93cm-L 2.89cm-H 5 years
	Dreissena	polymorpha	live	(numerous)
	Obliquaria	reflexa	relict	

#2 (right)

	Dreissena	polymorpha	live	(numerous) 3 years
	Bryozoan			
20'	Quadrula	quadrula	relict	
	Elliptio	lineolata	relict	
	Tritigonia	verrucosa	relict	
	Quadrula	quadrula	live	7.4cm-L 4.12cm-H 11 years
	Quadrula	pustulosa	relict	III
	Obliquaria	reflexa	relict	
	Obliquaria	reflexa	live	3.5cm-L 2.7cm-H 4 years

10/4/95 Survey

Quadrat 9 10ft 58°F bedrock/fines

#1 (left)

225'	Leptodea	fragilis	relict	
	Quadrula	pustulosa	relict	II
	Amblema	plicata	relict	
	Obliquaria	reflexa	live	3.1cm-L 2.3cm-H 3 years
	Dreissena	polymorpha	live	

Quadrat 10 9ft 58°F bedrock/sand/fines

#1 (left)

	Quadrula	pustulosa	relict	II
	Megalonaias	gigantea	relict	
250'	Fusconaia	ebena	relict	
	Amblema	plicata	relict	II
	Truncilla	truncata	relict	II
	Quadrula	nobilis	relict	
	Truncilla	truncata	live	1.9cm-L 1.5cm-H 4 years
	Dreissena	polymorpha	live	(numerous)

Quadrat 11 9ft 58°F sand on bedrock 20'

#1 (left)

	Amblema	plicata	relict	
275'	Quadrula	pustulosa	relict	III

10/4/95 Sunny

Quadrate 11 (#1) cont.

	Obliquaria	reflexa	relict
275'	Amblema	plicata	relict

Quadrate 12 9AM 58°F Solid rock/fission

#1 (left)

	Lasmigona	complanata	relict	
	Amblema	plicata	relict	
300'	Amblema	plicata	live	7.49 cm-L 5.81 cm-H 9 years
	Leptodea	fragilis	relict	
	Quadrula	pustulosa	live	
	Quadrula	pustulosa	relict	

#2 (right)

	Lasmigona	complanata	relict	
	Amblema	plicata	relict	
300'	Quadrula	pustulosa	live	5.35 cm-L 4.98 cm-H 7 years
	Proptera	alata	relict	
	Truncilla	truncata	live	3.1 cm-L 2.45 cm-H 4 years
	Lampsilis	cardium	live	3.22 cm-L 2.6 cm-H 3 years

11:05 am

10/4/95 Sunny

Quadrate 14

#1 (left)

350' 0 mussels

12:15 pm

Quadrate 15 (pink)

#1 (see below)

375'

Quadrate 18

0 mussels

450

Quadrate 19 sand substrate

475' 0 mussels

Quadrat 20

#1 (left)

500' Lampsilis cardium 6.2 cm-L 4.32 cm-H 4 years

Quadrat 15

#1 (left)

	Quadrula	quadrula	relict	
375'	Amblema	plicata	relict	
	Leptodea	fragilis	live	10.84 cm-L 6.25 cm-H 6 years
	Caddisfly			
	Proptera	alata	relict	
	Megalonaias	gigantea	relict	
	Dreissena	polymorpha	live	

12:45 pm

Hyatt note: Distance from Rt. bank
x 25' = distance to Quadrat.

10/4/95 1:20 p- Hyatt Summer

Transect 3 1000ft downstream from T-2
75' (just upstream- Sum catfish #3)

Quadrat 1 3" deep 58°C silt substrate
#1/#2
0 mussels

Quadrat 3 10" deep 58°C sand/silt substrate
#1
0 mussels

Quadrat 4 3ft deep 58°C sand/silt substrate
#1
100' 0 mussels

Quadrat 8 9ft deep 58°C rock / hard
#1
(left)
200'

Amblema	plicata	relict	+++ 1
Anodonta	grandis	relict	
Dorissensia	polymorpha	live	
Hebetancylus		live	
Quadrula	pustulata	relict	

10/4/95 Sunny

Quadrat B

(#2 right)

	Quadrula quadrula	relict	
	Amblema plicata	relict	III
200'	Dryaena		
	Pleuroceris	live	
	Fusconaia flava	relict	
	Quadrula pustulosa	relict	III
	Dreissenia polymorpha	live	

Quadrat 9 10ft 68°F rock/hard mud

(#1 left)

	Dreissenia polymorpha	live	
	Amblema plicata	relict	
225'	Quadrula pustulosa	relict	IIII
	Quadrula quadrula	relict	
	Obliquaria reflexa	relict	III
	Proptera alata	relict	
	Lampsilis teres	relict	

Quadrat 10 9ft 68°F rock/hard mud

(#1 left)	Amblema	plicata	relict
	Quadrula	pustulosa	relict II
250'	Fusconaia	ebena	relict

10/4/95 Sunny

Quadrate B

(#2 right)

	Truncilla truncata	live	2.55cm-L 2.19cm-H 3 years
	Quadrula pustulosa	relict	
	Obliquaria reflexa	relict	
250'	Fusconaia ebena	relict	
	Amblema plicata	relict	
	Dreissenia polymorpha	live	

Quadrate 11 9ft 68°F rock/hard mud

(#1 left)

	Quadrula pustulosa	relict II	
	Tritogonia verrucosa	relict	
275'	Lampsilis cardium	relict	
	Truncilla truncata	live	2.82-L 2.33-H 3 years

Quadrate 12 9ft 68°F rock/hard mud

(#1 left)

	Quadrula pustulosa	live	3.86-L 3.54-H 5 years
	Obliquaria reflexa	relict	
300'	Cyclonaias tuberculata	relict	
	Amblema plicata	relict	II
	Quadrula pustulosa	relict	II
	Amblema plicata	live	5.03cm-L 4.95cm-H 6 years

10/4/95 Sunny

Quadrate 12

#2 (right)

	Quadrula quadrula	live	8.24 cm-L 7.02 cm-H	11 years
	Dreissena polymorpha	live		
300'	Amblema plicata	relict	II	
	Quadrula pustulosa	relict	III	
	Ellipsaria lineolata	live	6.84cm-L 5.74cm-H	6 years
	Hedyleneis gigantea	relict		

Quadrat 13 9ft deep 58°C

#1 (left)

345'	Amblema plicata	relict	
	Quadrula pustulosa	relict	
	Truncilla truncata	relict	
	Obliquaria reflexa	relict	

Quadrat 14 13ft deep 56°C

1 (left)

	Dreissenia polymorpha	live	
350'	Obliquaria reflexa	relict	II

#2 (right)

	Amblema plicata	live	8.17cm-L 6.42cm-H	8 years
	Leptodea fragilis	relict		

10/4/95 Sunny

Quadrat 15 15ft deep 58°C sand

#1 (left)

	Quadrula pustulosa	relict
375'	Leech	live
	Amblema plicata	relict

Quadrate 17 17ft deep 58°C sand

425' no mussels

Quadrat 18 17ft deep 58°C sand

450' no mussels

Quadrat 19 17ft deep 58°C sand

no mussels

475'

Raing 55°F
cold
Trans. @ 10/06/91
Just below (500') out
fall 5 i Y.

Quadrat (1) to (1+2)
25' 1 proptera relic

quadrat (2) (1+2)
50' nothing 9' depth

quadrat (4) (1)
3 - Relic Amblema
2.3 cm L, 2.35 H 1 - live Amblema Q. pustulosa.
100' 1 - live Q. nodulata
5 yrs., 4.0 L
3.5 H

quadrat (5)
#1 upstream
175' 1 relic Amblema
1 - live obliquata reflexa
6 yrs. 4.2 L
od 3.5 H

#2 downstream
175' 15 ft. deep Sand
~~nothing~~
2 - Amblema relics
6.15 L 1 " live
4.82 H 6 yrs.

Transect 4 10/06/95

Quad 9
225' Sand - 15 ft deep
nothing
cloudy, rainy cold.

Quad 10
250' Sand
16' deep

Quad 13
325' Sand
16' deep
Rock

Quad 14 16' deep Sand
#1 upstream nothing

350' #2 downstream 16' deep Rock
16
nothing

Quadrat 17 16' Sand
water 58°F deep. nothing
425'

Quad 18 16' 58°F water
Sand + Bed Rock
nothing

10/6/91 cloudy cold 11:4x

Transect 5 55°F

1000' downstream of outfall 6

Quad, 1

±1

25'

4 Progptera helicina

2- Amblema helicina

3±1 Arcidonta grandis below

1- U. pustulosa helicina

±2

25'

8' deep mud-gravel

4 - Amblema helicina

1 - Progptera helicina

1- Hydrogenia larva

2 - Arcidonta gr. helicina

2 - Lina cubicula

Zebra mussels

Quad. 2

±1

50'

6 - Amblema helicina 7.1L 7.7H

1 - live Amblema

1 - U. quadrula

1 - Relic Arcidens

10/06/95

Quadrat
H c cont.

All relic

2 - Quad pustulosa
Relict
1 - Buttonbush mottle relic
1 - Pigweed sheet

12.10

Quadrat 3

#1

6 - Ambrosia relic
2 - Pigweed
1 - Quad ~~fragment~~ fragment mold
relict
1 - oblique reflexa fragment
relic

L=6.7 H=6.45 1 - live pustulosa
L=8.54 H=6.66 12 yrs. 1 - live ambrosia
L=4.22 H=3.27 6 yrs. 1 - live Tragia trifida truncata

#2 Sample

2 - live Ambrosia
1 - live pustulosa
L=6.93
75 H=5.9 8 yrs. 1 - live Quad Quad
4 - relic Ambrosia

#2 1- Quad quad helic

1- Lampsilis cardium helic

150' 2- Proptera alata helix

L=5.8 H=4.4 6yrs 1- Lima buttonfly

Quadrat 7 54°F air 12:50 pm cloudy

#1 15' deep

175' sand-thickmuck

1- helic Amblema

4- helic Anodonta grandis

2- helic Q. pustulata

2- helic Leptodea fragilis

175'

#2

1- Amblema helix

2- Proptera helix

1- Quad. quad. helic

1- Anodonta grandis

L=2.74 H=1.6 1yrs 2- Lima Leptodea fragilis

L=1.96 H=1.64 1yrs

Transects - 10/06/95 -

2 - Washboard sampler

75' L = 11.5 H = 8.2 9 yrs.
L = 12.45 H = 8.9 9 yrs.

Quadrat #5

125' 3 - Amblema Relic
2 - Proptera Relic
1 - live Amblema
L = 7.34 H = 5.89 6 yrs.
L = 8.9 H = 6.63 8 yrs.

L = 3.17 H = 2.19 3 yrs.
L = 5.07 H = 4.4 5 yrs. 2 = live Quadrula fragosa
L = 4.9 H = 4.79 7 yrs. 2 = live pustulosa
L = 4.23 H = 4.68 7 yrs.

L = 2.16 H = 1.6 1 yr. 1 - Leptodea fragilissima

Quadrat 6

Relic (#11)

150' #1 3 Amblema
2 - pustulosa
1 - obliquiana
mud/sand 10' deep 50°F

#2
150' sample 4 - Amblema relics
L = 9.4 H = 7.08 11 yrs 1 - live Amblema

Raising 10/6/91.

4 of from Reference Area

All Livia

1 – Lissura of Vecta

2 – Sutherfliz

1 – Fuscocrait flava

2 – Quadrula pustulosa

1 – Strophitus

1 – Livia Carinata. Is white

Rafinesquia

Ligamentina

L - 4.1
H - 4.6 5 yrs
L - 6.5
H - 5.2 6 yrs

2 – Sutherfliz

27 obliquata

+	L - 2.8	H - 2.0	4 yrs
+	" - 4.1	" - 3.3	5 "
+	" - 4.2	" - 3.3	5 "
+	" - 4.1	" - 3.2	5 "
+	" + 4.5	" - 3.6	6 "
-	L - 5.1	H - 4.4	8 yrs.
	L - 4.8	H - 3.9	7 yrs.

Quadrat 55°F Hard packed bottom
Transect 8 51°F water some mud

200' 1- Fusconaia ebena
3±1 Amblema plicata
1- obliquata
L-4.03 H-3.86 6yrs. 1- Quad. pustulosa
1- Lampsilis ovata ventricosa
L-5.75 H-4.7 6 yrs. 1- live Quad quad.
1- live pustulosa
L-5.6 H-4.6 6yrs
L-7.2 H-5.9 7yrs 2- live Amblema
1- live pustulosa

200' out to 425'
nothing.
Bed Rock
Sand at about
400' nothing

1:53 pm 10/06/95
Collect water & sediments
from 75' & 150' Quadrats
75- Washboard
150- Amblema
Distilled water rinsed
Clean hands - Gloves

12 Mile Dive

L-5.0 H-4.3 6yrs. – Quad Quad
L=6.7 H=5.8 8yrs.

10 – Quadrula Pust.

Length	Height	Age
3.7	3.5	5
3.0	3.0	5
3.9	3.9	5
4.2	4.1	6
4.2	4.3	7
4.6	4.5	6
4.6	4.6	6
4.9	5.0	8
4.5	4.7	7
5.0	4.9	8

3 – Amblema

Length	Height	Age
4.3	3.5	6
6.8	5.3	9
8.2	6.1	10

15 Mile Dive

13 – young pustulosa
1 – Quad Quad.
2 – obliquaria
7 – young Amblema

Sunny 9:48 AM 10/07/95
49°F

Transect 6
1400' downstream of outfall #6

Quadrat 2
50' Just as you (≈200') with intake
#1 Mothiora - Zebra mussels on Rocks
about 13' deep
#2 No mussels
50' Zebra mussels
1 dragonfly larva

Quadrat 3
75' #1 upstream of Corbicula
retained from sample
1 - live Amblema
mostly bedrock 2 - Relic "
1 - Relic M. granosa
1 - " @ Musculosa
75' #2 downstream Mothiora
Bed Rock

Quadrat 4
#3 Down stream
100' 6 - Relic Amblema
1 - bleached shell
2 - Quadrula pustulosa
live plecto cervus shell
live crayfish
1 - young 14"
Leptodea fragilis

Transect 6 Sample
of 75' - 100'

1. Amblema 9.4 L, 6.76 L ≈ 10 lbs.
2. " 9.0 L, 6.6 L ≈ 9 lbs.

10/07/95

Transect 6

#2 Cont
- 1- live ~~adult~~ Amblema small
- 2- live butterfly
- 1- live large Anodonta grandis
- 1- live pustulosa
- 1- live Quadrula quadrula

Retained 1 large Amblema for sample

100' #1 quadrat
- 3- live butterfly
- 2- live Amblema
- 4- Relic "

12 yrs. 1- live Quad Quad
4 yrs. 2- live Tricicilla truncata
1- Relic pustulosa

150' Quadrat 6
#1 only — nothing bedrock

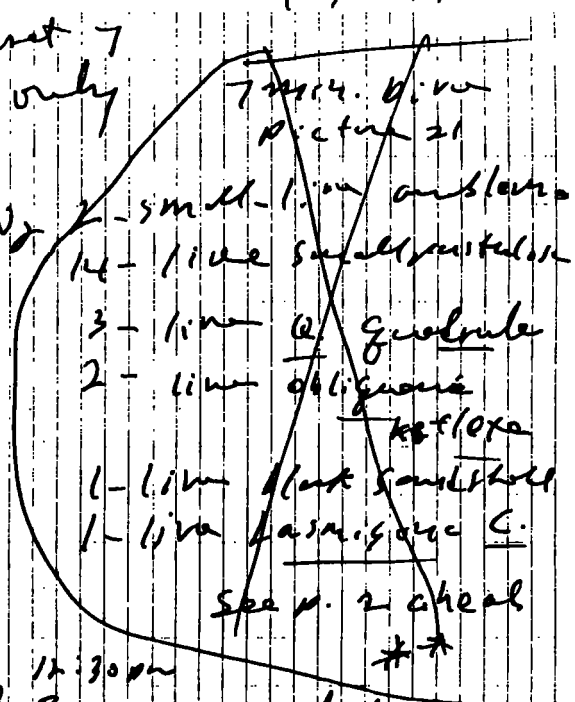
Transect 6 Cloudy 51°F 10/07/95

Quadrat 7

Quad #7 only

175'

Nothing



10/08/95 12:30pm

Quadrat 8 Sunny about 600°F air

200'

Nothing

Quadrat 9

#1 nothing Bedrock

225' #2 nothing

clean Transect 6
x 601

Sunday 10/08/95

275' Quad II
downstream #1

, Aptera alata relic
6 Relic Amblema
2 live Quadrula pustu
1 live quad. ~~Quad~~
1 live, 1 ~~dead~~ Quadrula metanevra
1 - Quad. pustulosa relic

Sample

upstream #2

1 - relic obliquata
2 - relic Q pustulosa
1 - Aptera alata relic
4 - Amblema relicts.

7.9L, 6.9H 11 yrs Q. Quadrula
6.4, 5.8H 9 yrs. Q. pustulosa
6.7L, 5.8H 8 yrs Q. metanevra

10/08/95

275' Spires did Q/H
Audit on dive of
Chaffin. Two Quadrula
appeared to have Lemonea
all mussels, mostly relicts.

+25'
#1 upstream
5.2L, 4.3H
7.2L, 5.2+H

13' deep
2 - live butterfly
5 yrs old
6 yrs old

1 - live Q. pustulosa
7 yrs.
5.7L, 4.8H

#2 no mussels

500'
#1 upstream

1 - live 3 Lidea
5.1L, 4.1 3H

10/07/93

Reference Area **

11:58 Sands with
Rt. bank Area bedrock
11:58 – 12:05 – 7 min. dive
2 – live Anadara secalli
14 – live small pustulosa
3 – live Q. quadrula
2 – live obliquana
1 – live black sandshell
1 – live Lasmigona

12:07 – 12:13 Grassy Dive

1 – Sandshell Black
7 – Anadonta
1 dp. pustulosa
2 – Ptychobera
1 – Quadrula metanevra
2 – Lattle fly
1 – live Pleurobema alata
2 – dead
1 – Quadrula modulata
1 – Obliquaria reflexa

10/07/93 am 1
9:30 Missing 111 lot.
1 – Missing
11 tan
6 cm H
about 8-9 yrs old

10/07/90

12:14-12:15 Reference Area
5 min Dil
L. hippiki female
6.9 L
5.7 L
6 yrs. old

3 - Amblema
12 - pustulosa
4 - obliquata

12:21-12:35
3 - amblema
3 - obliquata
1 - 3 yrs. old
3 - pustulosa
2 - ca. gravid
1 - butterfly

14 few relic
Amblema
F. flava
pustulosa

Aug. 10/07/95

24 Mile Diva

17 – Amblema

4 taken for sample

14 cm TL — 1 – Arcidens grandis

8.8 H — taken for sample

≈ 12 yrs — about 200' upstream

100' towards RT bank

From Higginsville site

8 – Quadrula

1 – obliquata

2 – Tritogonia

1 – Fusconaia flava

1 – Q. quadrula

1 – obovaria olivaria

7 yrs.

4.5 h cm

3.8 H cm

14:23

Diva

1 – L. siliquoidea

≈ 8 yrs

	Amblema	Sample
(1)	7.5 - 5.8	7 yrs
(2)	6.5 - 5.4	7 yrs
(3)	6.5 - 5.1	7 yrs.
(4)	7.6 - 5.9	7 yrs.

Morn. Temp. 34
Currat Temp. c. 50 sunday
9:45 10/08/95

Ref. area 62°F - water
Rt. BANK just
above creek. Above power
plant. Aquatic weed bed
station marked on concrete
↕Ref 4
12:15 pm Anodonta grandis bed
Amblema present
4-5 Ft. deep
Soft mud bottom

Ref. 2
Several Large Anodonta
Grandis
Three Samples

① 13.5L, 8.5H, 9 yrs Anodonta
② 10.8, 7.4H, 5 yrs Anodonta
③ 11.7L, 8.0H, 8 yrs Anodonta

Sunny ≈ 60°F air — Monday

10:53 Transect 7 — 10/09/95

Spikes did all of transect.

Quadrat 1 — mud in eddy downstream of power plant

25' — water 1ft. deep. — fewer with — Nothing

Quadrat 2

50' — No thing

Quadrat 3

75' #1 — 1 washboard relief; 2 - porites astreoides

75' #2 — 1 - washboard

Sample

12.9 | 9.0 H | 9 yrs. — Sample

10.1 | 9.9 H, 5 yrs — 2 - porites relief; 1 - live porites; 2 - 3 - hilse relief; 1 - live agaricia

3.8 | 3.1 H | 4 yrs. — 1 - live agaricia; 1 - relic A. prostulosa; Zebra mussels present; Hexagonia present

cc

Sunny mon. 10/08/95
cool start
60°F windy Transect 7

Quadrat 8

200' #1 only
#1 7 yrs + 1 - live heather
1 - Relict woolly
3 - @ pustulosa relict

Quadrat 9

#1 1 cowaster
225' 7 yrs. 2 - small live huckleberry
6 yrs.
7 yrs. - 1 Quad past. live
Salmon 2 sea anemone
1 - Relict Prostrata

225' #1 2 cupstra
3 - relict huckleberry
2 - live huckleberry
5 yrs + 6 yrs.
1 - keptoda from 1.U
4 yrs. old.

11:36
Quadrat 11 pic
225' #1 1 - live obl. quartz
5 yrs
Relict
2 - Pro dentata g.
1 - Prostrata
2 - Three ridge
1 - Quad. Giant

Sunny ≈ 62°F Morn.
Transect 7 10/08/95

Quadrat 11 Cont 56°F Water

225' #2 downstream
7 yrs. 1- line Amblema
3 - relic Amblema
1 - " Q. pustulosa

62°F Air

Quadrat 12

300' #1 upstream

2 - Truncilla Truncata
7 - yrs old
7 - yrs. old

1 relic Wabash
1 - relic Amblema

300' #2

1 - live
Q. pustulosa
7 yrs.
1 - relic Anodonta
2 - Amblema relic
1 - relic pustulosa

Zebra mussels
Caddisfly larvae

Quadrat 13 10'

325' #1 (end)
Nothing

mon. 10/09/95

Transect 7

Quadrat 4

100' #1 only — 1-live amblema (7 yrs.)

3 yrs — live — 1-Leptodea fragilis
1-Lelia walkeri
1-Lelia obliqua

9' deep — Caddis larvae
2-Lelia Arcidens
1-Truncilla truncata
1-Lima conbicula
1-Anodonta g. Lelia
Zebra mussels

Quadrat 5

125' — 1-pustulosa Lelia

9' deep — 2-Proptera a. alata
1-Amblema Lelia
Zebra mussels

Quadrat 7

175' #1 — Nothing
bedrock

175 # 2 — Nothing
Bedrock

Sunny windy 6:0[illegible]
Transect 7 10/09/95

Quadrat 13 cont' water 56°F

4 - (down)

3.25'

1 - Helix Arboretum Grandis

1 - Pantala Flavescens

1 - Libellula Luctuosa

1 - Butterfly Pelia

1 - large dragon fly Larva

1 - Lina Leptodea (Frag.)
in the butterfly mussel
1 yr. old

Quadrat 14

1 only

1 - Quad Pelia

35'

1 - Lina butterfly
6 yrs.

1 - Q. Pustulosa Lina
3. yrs

1 - Lina ob. Leptodea 5yrs

Transect 7 10/09/95

Quadrat 16

40s' 1-only Nothing

Quadrat 17

43s' 1-only

5 - Amblema valvata
1 - Quad. quadrula
1 - live Quad quad
8 yrs.
1 - Obliquaria 6 yrs.

Free dive at 75' (about) for sample

Sample Anodonta - 13.0L, 7.9L
10 yrs

Sample Washboard - 10 yrs
All live 1 - Leptodea fragilis
6 - live Amblema small
~ 6 yrs. old.
1 - 6 yr. old - Quadrula quadrula

≈ 65°F Air 1403 pm

Transect 8

56°F water

Quadrat 2

4' water depth

50' #1 & 2
Silver

no mussels
no larvae
no R. ovata
5, 1 Hex clam

Quadrat 4

100' #1 UP

1 - Quadrula nodulata 4 yrs.
2 - Relic Truncilla
3 - Relic Lampsilis
4 - Three ridge Helisoma
1 - Relic Obovaria olivaria

100' down #2

Quadrat 6

150' #1 UP
Damselfly
Stenonema

Sample Washboomer
1 Lymn, 12.2 L, 8.5 ft
1 - white heelsplitter
11 yrs 14.0 L, 11.1 ft
1 - live Ellipsaria
P.H.H. C.O.H 8 yrs

1 - live Truncilla
P.O, G.Pit 12 yrs.

Trans. 8 10/06/87

Quadrat 19

475' #1 nothing

475' #2 Nothing

375-500' nothing
Bedrock or sand
and bedrock
Zebras on exposed
bedrock

1430 10/09/95

Transect 8

Quadrat 6

150' #2 Several relic

Zebra mussels

Quadrat 7

175' #1 up 2 - Leptodea fragilis

1 - threeridge

Leptodea — 2 yrs.

3.4L - 1.6H

Leptodea - 5 yrs

11.6L, 6.5H

1 - threeridge 6-7 yrs

6.6L, 5.4H

175' #2 down

8 - relic Amblema

1 - live Amblema

c. 10 yrs, 9.2L, 7.1H

1 - relic Leptodea fragilis

1 - Relic F. flava

1 - Relic butterfly

Trans. 8 (4/09/9-

200' Quadrat 8
225' Quadrat / Nothing
Sand on bedrock
10 ft.

275' #1 up grav — 2 - Relict shell tubes
1 - F. flava relic

375' #2 down — 1 - Fusconaia flava Relic
2 - Amblema relic
1 - live black sandshell
11.1 oz, 4.7 H, 57 S.

Quadrat 6/6
400' Bedrock
Nothing

Quadrat 7
425' Nothing

Quadrat 8
450' #1 Nothing
#2

Air temp. 49 start

Transect 9 TVOR 10/10/85

55°F water temp

Quadrat 1 — mud

25' #1 — 1 - live Q. gunk
5 yrl., 5.5 L, 4.9 H
1 - relic grandis
1 - relic austrolaka

25' #2 — 1 - relic washboard
2 - relic sunbeams

Quadrat 2 — mud

50' 1-only — 1 - live thracia
8 yrs., 6.3 L, 5.6 H

Quadrat 3 — mud

75' 1 only — 2 - thracia 1 live
7 yrs, 6.2 L, 4.9 H
7 yrs 6.9 L - 4.7 H

Quadrat 4 — Rock - some

100' 1 - only — Relict only

Quadrat 5 — Rock - some

125' #1 up — relict only

#2 — 1 - live Q. austrolaka
live pleurocera, 7 yrs., 5.1 L, 5.0 H
1 - live thracia
7 yrs., 5.9 L, 5.1 H

Sunny Cool Tues. 10/10/95

Transect 9

Quadrat 6 9' Rock Sand

150' #1 up 2 - Quad. pustulosa
9 yrs., 5.4 L, 5.1 H
11 yrs, 6.0 L, 5.9
1 - Truncilla truncata
4 yrs., 2.1 L, 2.1 H

150 #2 down 1 - Lima Corbicula
1 - Lima Ambigua
8 yrs, 7.1 L, 5.5 H
1 - Lima L. complanata
8-9 yrs, 7.5 L, 11.2 H

Quadrat #7 1 - 3 rider
175' #1 3 yrs., 2.3 L, 2.0 H
5 - yrs., 1 - Lima obliquata 4.5 L, 6 H
1 - Lima 3 - rider
7.7, 6.1 H, 10 yrs

Quad. 8
200' 1 - L. Higginsi
8 yrs. 11.0 L, 8.0 H 5.9 W
Retagonia 1 - Lima Leptodea frag. 1.5
1 yr. 2.7 L, 1.5 H
Rock, Sand
some mud.

TRANS. 9

10/10/95

Quad. 9 water temp 55° = sand mostly

225' #1 OT L. Higgins 5 yrs
88L, 6 GH, 5-1W

1-live Q. Quad
8 yrs, 5.3 L, 4.3

225' #2 nothing

Quad. 10

250' #1 nothing
sand

250' #2

quad 12

300' #1 nothing
300' #2 nothing relic

quad 13

325' #1 W. nothing

325' #2 down 3 - Amblema live
1 - live o. Aliquarius

over

Trans. 9.

10/10/95

325' Con + L-obliquenia reflexa'

4.2, 3.4 H 5 yrs

Amblonia 7 yrs.
6.3 L, 5.2

Amblonia 6.1 L, 5.8 8 yrs.

Amblonia 7.6 L, 5.9 H
8 yrs.

Trans. 9 14/10/95

Quad 14

350' #1 Nothing

350' #2 1-Q. pustulosa
5 yrl. 3.7 L, 3.5 H

Transect 10

10/19/95

175' down line

1 – Amblema 6yrs

1 – Q. pustulosa 8yrs

1 – Obovaria olivaria 10yrs. 5.6L, 4.3H

Quadrat 8 200' — Nothing

Quadrat 9 225' very little habitat

1 – butterfly 8yrs 7.4L, 5.6H

1 – Lasmigona comp. 13.5L, 10.6H 11yrs.

Quadrat 10 250' #1 #2

1 – univolve

Rolin only.

Hard pack clay

Transect 10 62°F air 10/10/95

11:50 @

Just down & then off wide 100-250'
quadrat 3 intake channel wall 50' face
75' #1 bedrock
nothing
75' #2 back side of water intake

quadrat 4
100' #1 Relict
Gin Cadd. flim
Gin pleurocarid snails
100' Helics only

quadrat 5 mostly bedrock
125' 1 only Relict only

quadrat 6
150' quadrat 6
250' #1 #2 / nothing bedrock

Quadrat 1 5yrs - Trunc. fruncata/ins
175' #1 4yrs 2 - Q. gnaphalia
74-3.7-2-6.1+ 2 - Q. pastinaca 5yrs
40, 3.8+ 5yrs. 1 - Q. rhetahamna
1 - Fuscogaia flava
1 - Amblema
6yrs.

Transect 10

10/10/95

Quadrat 12 nothing

300'

1 only

quadrat 13

325' #1

nothing

#2 nothing

Quadrat 15

375' nothing

Quadrat 16 picture taken

400' ½ - ¾ inch long

Asicidians Conglagosus

byssal attached to massel rocks.

Trans 10

Free lived from beginning of Transect to the bank in very shallow water, found no mussels.

71°F Air 1854 Tues

Transect 11 10/10/95

~~2~~ 550-600 ft downstream of water intake

Quadrat 2 — muck - mud 7-8' deep water

50' #1

50' #2 — Relic only Zebra mussels

Quadrat 3

75' #1 — Relic only caddis + leeches

75' #2 — Relic only Zebra mussels

Quadrat 4

100' — Relic only Zebra mussels

Quadrat 5

~~150'~~ #1

150' #2 — Relic only Zebra mussels

Transect 11 10/20/95

Quadrat 8

200' #1 / Solid Rock North, N

200' #2 /

Quadrat 9 +45° Solid Rock

225' 1 only Relic thuyarites only on top of bedrock

Quadrat 10 1 - oblique quartz keeler 5yrs 4.3, 3.3 H

250' 1 only 2 - butterfly 6yrs 7.2 5

1 - pustulosa 4yrs

Butterfly 6yrs

Quadrat 11

275' #1 1 - Quadrula pustulosa 11yrs 4.7, 4.7 H

275' #2 2 - Quadrula Quadrula

11yrs 7.7, 5.8 H

8yrs 8.1, 6.4 H

Transect 11

10/10/95

Quadrat 12

300' Lonely Lep. 2-live butterfly
7 yrs each
Connect with 1- obliqua 5 yrs
Zebras 1-3 rudge 4.3', 3.6 H
6 yrs.

Quadrat 14

350' bedrock
nothing

Quadrat 17

425 +1 up 1-obrain 01: Vanic
5 yrs 3.5', 4.4 H
4 obliquaric velleta
4 yrs, 4 yrs, 4 yrs, 4 yrs
+1 C 4 yrs 5.2', 4.4 H
3 pustulose
4 yrs - 3.5', 3.4 H
4 yrs - 4.1', 3.7 H
5 yrs - 3.9', 3.5
1- butterfly 7 yrs
1 pupa
5 yrs 3', 5.6

425 +2 down 1 pustulose
7 yrs 5.4', 5.1 H
Collision 1 3+ day
8 yrs 6.3', 4.9 H

Transect II

10/10/95

Quadrat 18

475' # 1 ap — Relic prop/ora addition

475 #

475' down

1+L hindgirdle
10.1L, 7.1H, 5.8W

bad track with crevice

1 - truncilla donaciformis

2 - Quadrula pustulosa

1 - obliquata 5 yrs
4.5-4, 3.7H

1 - threadfin 7 yrs
7.8, 5.9H

1 - butterfly 7 yrs
6.7, 5.0H

2 - pustulosa
4.3L, 4.0H 5 yrs
3.8, 3.7H 5 yrs

Quadrat 20

500' all line

3 - butterfly
5 - pustulosa 6-10 yrs
1 - obovaria olivaria
9 yrs, 6.1H
2 - butterfly (10 yrs)

sample 1 - threadfin 9 yrs
9.6, 7.1L

Much of the immediate mud flats less than a foot deep now were dewatered during recent low flows according to survey personnel observation

09:43 sunny 62°F Air

Transect 12 10/11/95

50' downstream of outfall 002

Quadrat 1	About 1' deep or less out to 150'+
25' 1-only	soft mud with some sand
	nothing
Quadrat 2	
50' #1	Ruffed butterfly
50' #2	nothing
Quadrat 4	soft mud
100'	nothing
Quadrat 5	
125' #1 up	A little
	sediment over
	bedrock
125' #2 down	nothing
Quadrat 6	1-live Leptodea fragilis
150' 1 only	9.6 g, 6.1 H, 6 yrs
	Relic, worn beak, Umbilicus
	3-ridges, Q. quad.

Transect 12 10/11/91

Quadrat 8

200' 1 only Rebia Anadara g.
Q. pust., prop. alata
washboard, three ridge
butterfly, Q-quad., T. truncata
T. verrucosa
1 via Zebra mussels
1 nice Chagfish 3"

Transect 9

225' 1 only 1- live Quadrula
Quadrula
7.2#, 5.9#, 9.9#
Relic L. complanata, L. fragilis
P. stagnalis, pectinata
3-ridge, obovaria olivaria
Quad. quad

250' Quad. 10
1 only bedrock
boulder matrix

Quad 13

225' #1 25' deep 51°F water
Boulder +
Sand bottom

Sunny

Trans. 12

10/11/95

Transect 13

325' #2

Boulders & sand

NO FISH!

Quadrat 16

400' Sample

1 - live gastropod

14 yrs, 10.2 L, 7.8 H

1 - live Haliotis fragilis

4 young cattle

1 old bullhead

1 - Heptagenia Relicta

4 - Ovata

Procoptera alata

Quad. 17

425' #1 UP

1 - live Haliotis rufescens

6.8 L, 6.1 H, 10 yrs

Time 1140

Sample - 1 - live gastropod 10 yrs

8.7 L, 6.9 H

3 - Relicta alata

#2

1 - live gastropod

8.9 L, 6.8, 10-11 yrs

1 live Snail

Caddisfly

1 - live 3-horn 5 yrs

1 - live butterfly 3 yrs

1 - live Quad. Gastropod

1 - washboard piled

Trans. 12

10/11/95

Quad. 18
+50'
1 only

Rock
Nothing

Quad 19
47.5'
1 only

Rock
nothing

52°F water

1 - line obovarie diatoms
2.9L, 2.4H, 3 4+s.

Quad 20
50'
1 only

2+ live 3-4 orm
4 4+s.
(3.8, 3.2H) 4.5L, 3.5

Pure
Sand

Helic L ovata

Boulder

Helic 3-4 orm

1303 Trans 13 Sunny
Air Temp 73°F 10/11/95

Quadrat 1 — NO mud flat
25' — Lit sample 25' from water edge
150' upstream of outfall 001

1 relic — three riders
Fine erosion Sediment

Quadrat 3
75' #1 up — All relics
Some stuff
75' #2 down — All relics
Fine Erosion Sediment

Quadrat 4
100' — Relics
Mud/erosion Sediment

Quadrat 5
125' #1 up — 3 horn, 2 Dyer oil
relic washboard
Sand
125' #2 down — Sand
Blank — No thing
Sand

very windy sunny

Trans. 13 10/11/95

Quadrat 6

150'

Quadrat 7

170' 2 - Amblema live

Sample 8.34, 6.2H c. 8 yr

8.64, 6.9H c. 12 yrs

8yrs 1 - live Arcidens confragosus

12yrs. 1 - live Q. gibbosa

200' quad 8

200 ± 1 m 4 - live plagiola lineata

Shells on shore

1 - live Valvata

Relic Shells

200 ± 2 downstream

1 - live Lasmigona complanata

Mud bar

Relic shells

Shells on bank

Trans. 13 sunny/windy
10/11/95

275' Bedrock
Nothing 15' dep

TRANS. 12
300' Sand
NOTHING

Very-very windy

325' TRANS 13
#1 nothing Sand
nothing Sand

---

350 Trans 14
1 & 2 Nothing
CANT

Trans. 13

10/11/95

Quad 17

425' #1 North wall

#2 Boulder/clay

19'-20' deep No substrate

for mussels

Quad 19

475' ±1 North wall

19' deep Boulders

Transect 14 start

10/12/95

About 600' downstream of outfall pool side

Area D. Sunny, windy

1046, 71°F Barometer 30.18

Quadrat 1

25' up nothing

25' down Mixed depth gravel

Riv 87m, 13.2 ft, 8.8 ft

Quadrat 2

50' #1 1 - melic leptodea

50' #2 nothing

Trans. 14 start →

Trans. 1 of

Sunny, 71°

10/12/91

Quadrat 3 — Zebra mussels present — 58°F water — 10' deep

75' 1 only — Arc. dense Cont. fragged — 7.5L, 5.7H 5 yrs. relic washboard

Rock mussels crushed

Quadrat 6

150' 1 only — relic three riders ~~7.4L, 5.9H 5 yr~~

Quadrat ~~200~~ 8

200' — Relic Anodonta

± 1 yr — mostly rock with some erosion sediment — relic 3-riders

200' ± 2 down — 1 live Q. Quad — C. illyri. 8.0L, 6.9 — Relic 3 riders

---

Quadrat 9

225' ± 1 yr — live 3-riders — 6 yrs 6.0L, 4.9H

225' ± 2 down — Relics only — 3 – 3 riders — 1 – Anodonta grande — 1 – 3-horn

Trans-14 Survey

1.1 12/9 water T. 58°

Quadrat 12

300' 1 adult Hoptera

Quadrat 13

325' ± 1 imm Lepidoptera

7yrs, 6.5H, 5.5H

±2 down 2 - 3rd instar Heliconius

4 - pupae Lepidoptera

adult

1 adult T. Hemiptera

1 live Q pupa Lepidoptera

7yrs, 5.6H, 5.5H

Quadrat 14

350' Sand Nothing

TRANS. 14

375' up Sand Nothing

375' down. Sand Nothing

Trans. 14

10/12/95

Qual. 16

400'

Sand
nothing

Qual. 19

475'

Sand
Nothing

Qual 20

500'

Sand
Nothing

Trans 15 76° Sunny up to 25 mph winds 10/12/95

Quad. #1

25' up
25 down

Rocky substrate

Quad. 2
50'

3-line Pleurocera snails

Quad 3
75'

Zebras
Relic
3-4 lg
L. Quarter

Quad. 4
100' 1-up
100' 2 down

Zebras
Relic shells only
3-4 lg
prosobran
3 other waterboard
pantulose
1- live crayfish
leech
flatworms
live snails
Caddis flies

TRANS. 15 Sunny

10/12/95

Quad. 5

125' ± up — 2 - live butterfly
Zebra covered

125' ± down — 6 yrs. 2 butterfly
6 yrs. 1 - Quadrula
8 yrs. Quad.

Quad. 7 — 6 yrs 6 yrs. 2 - live butterfly
175' — 7 yrs. 1 - live threeridge
Relic shoveling.
Leather
Other relic

Quad. 8
200' — Rocks
nothing

Quad 9
225' — live
T. truncata
4 yrs. 4.5+, 3.8+
1 butterfly
7 yrs 6.1+, 5.0+
1 - live Quad aust.
6 yrs., 5.5, 5.4+

Trans 15

10/12/95

Quad. 10
250' — Rocks
nothing

Quad. 11
275' — Rocks
Bedrock

Quad 12
300' — Rocks nothing

Quad 13
325' — nothing

Quad 14 — bedrock sand
All live
350' 1 - 3-Horn 6 yrs, 3.9, 3.3+
1 - pustulata 6 yrs, 4.0, 4.0
1 - Butterfly 4 yrs 4.7, 3.9+
1 - 3-ridge, 6 yrs 6.2+, 4.7+

TRANS. 15 sunny 10/12/95
c. 80°F

Quad 17
425' Bedrock
nothing

Quad 19
475 Bedrock
nothing

End 15

60°F Air 0935 sunny very windy
@ TRANSect 16 10/13/95
900 ft downstream of
Trans. 15. Just in Duck
Creek bay at upper edge.

Quadrat 19
475' Sand w/ boulders
nothing

Quadrat 17
425' Sand
Rocks
nothing

Quadrat 16
400' Sand Rocks
nothing

Quadrat 15
375' @ 1 up. Temp 52°F
375' @ 2 dwn. Sand +
Rocks
nothing

10/13/95

mph Front approaching sunny to north cloudier
20-25 Windy! Trav 1.16

350 Quad-1f

① Sand
Nothing

---

300 Quad 12
1 tr

Sand
Nothing

Quadrant 11
275' mostly grassed 1 like 3-horse
① 4yrs 3.9 4, 3.2 H
Zebras

Quadrant 10
2250' relay 3 riders 2 - 3-horse 5yrs. 4-0 L, 3.5 H
① 11 participants 6yrs. 4.9 L 3.9 H
6yrs. 4.9, 3.9 H
3 - mostly 3da
7yrs. 5.1, 4.9 H
8yrs. 5.2, 5.2 H
9yrs. 6.1, 6.0 H

Quadrant 9
200' Sand
① 1 like Quad horse
8yrs. 5.5 L 4.9 H

Trans. L.

Quad. 4

100'

1 — 5 = live threeridges
4: 8 yrs old
1 - 12 plus

2 — 2 - live pustulosa

live 1 Quad genal

live 3 Butterfly
3 - 5 yrs each

2 - threeridge-like
5 (live) - A. imbecillis
1 yr., 1.0 1.0 1.0 1.0 1.0, 0.6A

Quad. 3

#1 — Truncill truncata
6 yrs.

#2 — A. imbecillis
2 yrs 3.5C, 1.7A

1 yr. dragonfly larva

Rough Water

Quad 2

50 live snail

90 live A. imbecillis
2 yrs. 3.4, 1.8

Channel

Quad. 6

150'

@

Trimerotis

10/12/85

Sand

3 - live Quad. Pustulosa
6 yrs. 4.3C, 3.4A
6 yrs. 4.3, 4.3C
7 yrs. 5.0, 4.8C
1 - live 3 - ridge
5 yrs. 4.1, 3.4A
1 relic Q. Quad.

Quad 6 Sand/mud

125'

#1 w/ flatworms caddisfly

#2 clam

1 - live @ Pustulosa
6 yrs. 4.6C, 4.5A
6 yrs. 3.8, 3.6A
several relic
live T. donaciformis
2 yrs 1.6C, 1.1A

1 - Truncill truncata
4 yrs 3.6C, 3.2A

1 - Quad. Quad
10 yrs,

line 3 - Quad pustulosa
5 yrs, 8 yrs, 8 yrs

Sand + mud

Caddisflies
Several relic

See opposite page

Sunny windy 1200 start

Spires Transect 7 10/13/95

Quad. 19

475' Solid bedrock

nothing

Trans. immediately on point (rip-rap) downstream of Duck Creek

Quadrat 14

400' #1 WP Solid bedrock

#2 dam nothing

Quadrat 15 Sand Rock

~~325'~~ nothing

Sand Rock

Quadrat 13 nothing & Sand-Rock

325 1+2

---

quad 12 About 4" sand

300' (1) on

bedrock

Quad. 11

275' about 4" sand

(1) on

bedrock

(2)

---

very windy sunny ~75°F

Trans. 17 10/13/95

Quad 10

250' Bed Rock,

(1) thin Sand

Quad 9

225' 1 live Quel. post

(1) 5 yrs., 3.5 L, 3.3 H

Quad 8 1 relic post hole

200' Flat w/ some organic

(1)

Quad. 7

175' Deep Sand

(1) nothing

175'

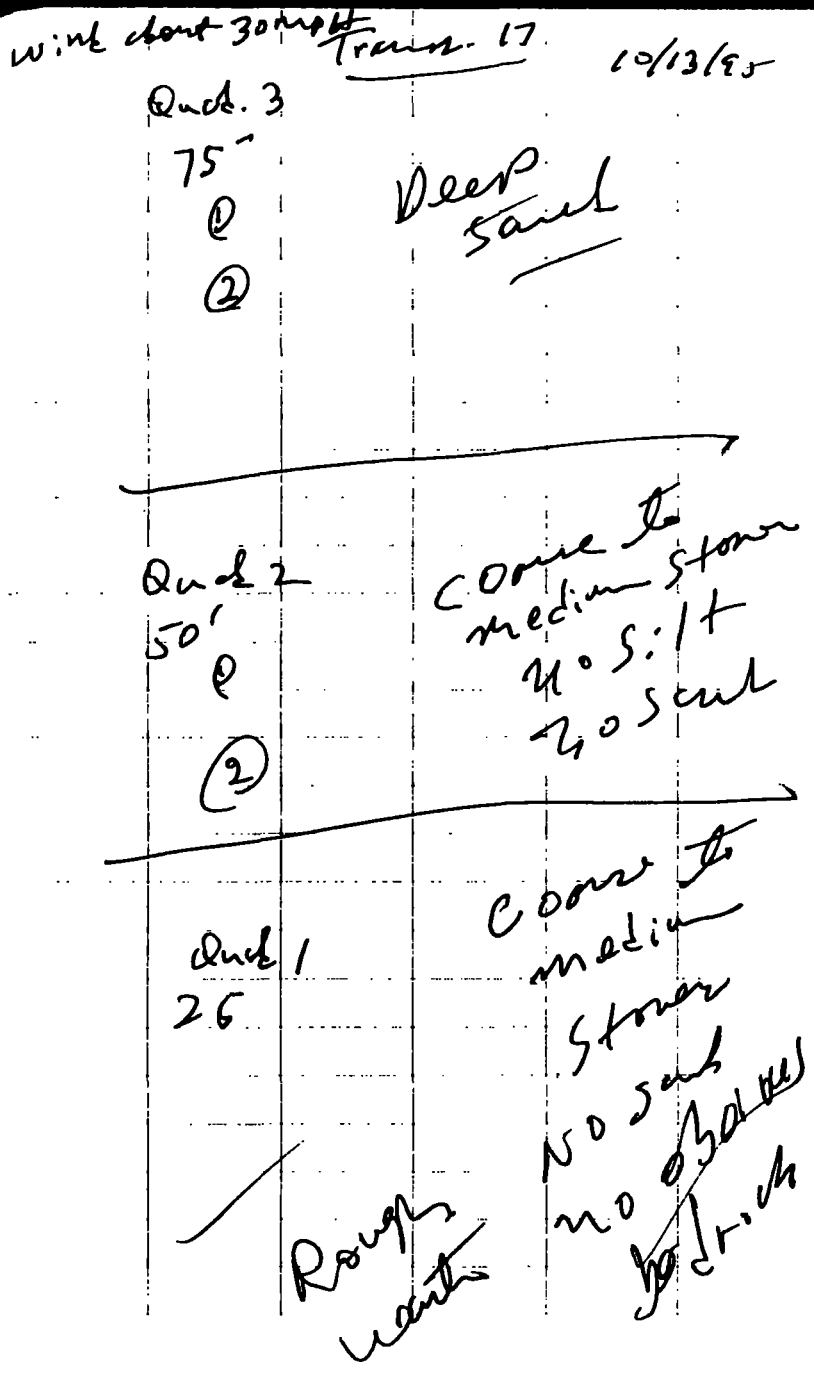
(2)

---

quad 6 Deep Sand

150' nothing

(1)



CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20′ to the R. at Station 542 + 72.

Ext. in Tab. I opposite 23° 20′ = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

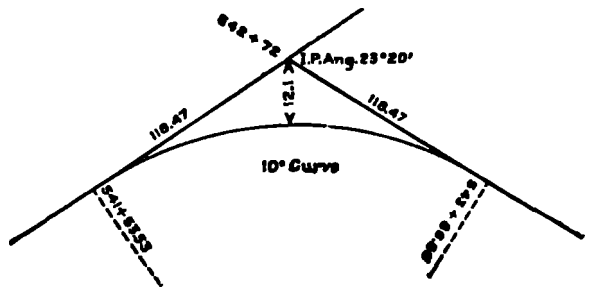
Tan. in Tab. I opp. 23° 20′ = 1183.1
1183.1 ÷ 10 = 118.31.

Correction for A. 23° 20′ for a 10° Cur. = 0.16
118.31 + 0.16 = 118.47 = corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20′ = 23.33° ÷ 10 = 2.3333 = L. C.

2° 19½′ = def. for sta.	542	I. P. = sta.	542 + 72
4° 49½′ = " " "	+ 50	Tan. =	1 .18.47
7° 19½′ = " " "	543	B. C. = sta.	541 + 53.53
9° 49½′ = " " "	+ 50	L. C. =	2 .33.33
11° 40′ = " " "	543 +	E. C. = Sta.	543 + 86.86
	86.86		

100 − 53.53 = 46.47 × 3′ (def. for 1 ft. of 10° Cur.) = 139.41′ =
2° 19½′ = def. for sta. 542.
Def. for 50 ft. = 2° 30′ for a 10° Curve.
Def. for 36.86 ft. = 1° 50½′ for a 10° Curve.



CHAIN OF CUSTODY RECORD

2010

JOB #	PROJECT NAME
95NOV6 T220	ALCOA SEDIMENT STUDY

SAMPLERS: (Signature) Todd O'Hara

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB F/U	SVOC F/U	VOC TCLP	CN	Metals TAL	TSS	REMARKS
WD06-02-R110	9/24/95	1645	WATER	18	✓	✓	✓	✓	✓	✓	Filtered & Unfiltered Samples
WD04-02-R10	9/24/95	1600	WATER	18	✓	✓	✓	✓	✓	✓	"

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd O'Hara					
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	
				Analytical Methods per Project Instructions	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2014

JOB # 95N016	PROJECT NAME	ANALYSES REQUIRED	WOODWARD-CLYDE CONSULTANTS
Task 020	ALCOA - Sediment		P.O. BOX 680925 FRANKLIN, TN 37068-0925 (615) 790-0003 FAX (615) 790-0023
SAMPLERS: (Signature)			

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	WCB	SVOC	TOC	VOC	TSS	Metals	REMARKS
W001 - Equipment Rinse	9/25/95	1800	Water	17	✓	✓	✓	✓		✓	Filtered ; Unfiltered
W001-03-R110	9/24/95	1735	Water	18	✓	✓	✓	✓	✓	✓	" "

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	9/25/95 1800				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	
				Analytical Methods per Prior Instruction	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

001-01A-R160

2011

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N016 Task 030	ALCOA - Sediment Study

SAMPLERS: (Signature) Todd D. Uhl

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: ABS F/U	SVOC F/U	VOC TOC F/U	TSS	CN	Metals	REMARKS
W001-01A-R60	9/25/95	1150	Water	18	✓	✓	✓	✓	✓	✓	F. Hgreg (F) / Unf. Hgreg (U)
W001-01A-R(a)-MS	9/25/95	1215	Water	18	✓	✓	✓	✓	✓	✓	Matrix Spike
											~~Matrix Spike Dupl. TOH~~ 9/25/95

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd D. Uhl	9/25/95 18:30				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	
				Analytical Methods Plus Inc.	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N016 Task 020	ALCOA Sediment Study

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: DCB FLD	8260C FLD	8260C LAB FLD	TCL	Metals	CN	REMARKS
W001-01A-R100-MSD	9/25/95	1223	Water	18	✓	✓	✓	✓	✓	✓	Matrix Spike Duplicate
W001-01A-R100	9/25/95	1300	Water	18	✓	✓	✓	✓	✓	✓	Filtered = Unfiltered

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	1800/9/25/95				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS Analytical Methods per Data Validation Instruction	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2013

JOB #	PROJECT NAME
95N016 Task 030	ALCOA Sediment Study

SAMPLERS: (Signature) Todd Duff

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	SVOC	TOC	VOC	Metals	CN	REMARKS
W001-01B-R10	9/25/95	1337	water	18	✓	✓	✓	✓	✓	✓	Filtered + Unfiltered
W001-Duck Creek	9/25/95	1525	water	18	✓	✓	✓	✓	✓	✓	" "

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd Duff	1800/9/25/95				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	
				Analytical Methods per Dave Instruction	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2016

JOB # 95-3016	PROJECT NAME	ANALYSES REQUIRED	WOODWARD-CLYDE CONSULTANTS P.O. BOX 680925 FRANKLIN, TN 37068-0925 (615) 790-0003 FAX (615) 790-0023
TAK 020	ALCOA - Slorida		
SAMPLERS: (Signature)			

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED	REMARKS
W001-						
W017-01D-R100	9/21/95	1520	Water	18	✓ ✓ ✓ ✓ ✓ ✓	Filtered - Unfiltered
W017-01D-R100-Dup	9/21/95	1520	Water	18	✓ ✓ ✓ ✓ ✓ ✓	Field Duplicate

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	1500 9/26/95				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2 2015

JOB #	PROJECT NAME
95W0116 TASK 11	ALCOA - Sroom

SAMPLERS: (Signature) Todd A. Ivey

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
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(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	PCB FLW	SVOC FLW	VOC FLW	TOC FLW	Metals FLW	CN	REMARKS
~~WOO~~											
~~WOO~~											
W015-01D-R50	9/26/05	1330	Water	18	✓	✓	✓	✓	✓	✓	Filtered = Unfiltered

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd A. Ivey	1604 9/26/05				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95WNK Task 08	ILCUA - SOIL/GW

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB VOC	ANALYSES REQUIRED: VOC	ANALYSES REQUIRED: TCL	ANALYSES REQUIRED: TAL	ANALYSES REQUIRED: TAL	ANALYSES REQUIRED: CN	REMARKS
WOOS-03-R50	9/26/95	1150	Water	18	✓	✓	✓	✓	✓	✓	Filtered & Unfiltered
WO16-010-R50	9/21/95	1405	Water	18	✓	✓	✓	✓	✓	✓	" "

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	9/26/95 1200				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

20[illegible]8

JOB #	PROJECT NAME
C[illegible]	[illegible]

SAMPLERS: (Signature)

T [illegible] T Thompson

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	8260	[illegible]	CA	TCLP	[illegible]	VOA	REMARKS
[illegible]	11/3/95	1500	[illegible]	3	✓	✓	✓	✓	✓		
[illegible]			[illegible]	3	✓	✓	✓	✓	✓		
[illegible]			[illegible]	3	✓	✓	✓	✓	✓		
[illegible]	11/7/95		[illegible]	3	✓	✓	✓	✓	✓		
[illegible]			[illegible]	3	✓	✓	✓	✓	✓		
[illegible]			[illegible]	3	✓	✓	✓	✓	✓		
[illegible]			[illegible]	3	✓	✓	✓	✓	✓		
[illegible]	11/8/95		WATER	RI	✓	✓	✓		✓	✓	EQUIPMENT RINSATE
	[illegible]										

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[illegible]	11/8 1500				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
15N1016	ALCOA

SAMPLERS: (Signature) T. Thomson, T. Thomson

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
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FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	PCB	METALS	CN	TOC	SVOC		REMARKS
SW16-MID-ESD	11/5/15	1400	Sediment	3	✓	✓	✓	✓	✓		
~~SW16-MID-ESD~~	~~11/5/15~~	~~1400~~	~~Sediment~~	~~3~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~—~~	~~—~~
SW16A-MID-ESD	11/29/15			3	✓	✓	✓	✓	✓		
SW15-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW15B-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW15A-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SW13A-MID-ESD	11/8/15			3	✓	✓	✓	✓	✓		
SW13B-MID-ESD	11/8/15			3	✓	✓	✓	✓	✓		
SW14A-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW14-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW14B-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW14C-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW12B-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		
SW12A-MID-ESD	11/5/15			3	✓	✓	✓	✓	✓		

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	11/6 1130				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2010

JOB #	PROJECT NAME
95J1016/20	ALCOA

SAMPLERS: (Signature) T. Hood / T. Tillotson

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	METALS	CN	SVOC	TOC		REMARKS
[illegible]	11/1/95	1150	[illegible]	3	✓	✓	✓	✓	✓		PLEASE NOTE THAT DATES ON THE
[illegible]	11/1/95	1130	SED	3	✓	✓	✓	✓	✓		CHAIN OF CUSTODY ARE CORRECT-
[illegible]	11/1/95	1140	SED	3	✓	✓	✓	✓	✓		NOT DATE ON THE SAMPLE CONTAIN
[illegible]	11/1/95	1150	SED	3	✓	✓	✓	✓	✓		ER.
[illegible]	11/1/95	1200	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/95	1210	SED	3	✓	✓	✓	✓	✓		
[illegible]	[illegible]										
[illegible]	11/1/95	1220	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/95	1230	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/95	1240	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/95	1250	SED	3	✓	✓	✓	✓	✓		
SDLGA-DIC-4000	9/29/95	1730	SED	3	✓	✓	✓	✓	✓		
SDLGA-DIC-RIDUPS/MSD	9/29/95	1730	SED	3	✓	✓	✓	✓	✓		

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	10/2 1705				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2011

JOB #	PROJECT NAME
[illegible]	[illegible] ENVIRON.

SAMPLERS: (Signature) T. [illegible] Tillman

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: TCLP	TCLP VOCS	TCLP METALS	CN	TOC		REMARKS
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
[illegible]	11/1/15	[illegible]	SED	3	✓	✓	✓	✓	✓		
								✓			

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[illegible]	11/2 [illegible]				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2012

JOB #	PROJECT NAME
(illegible)	(illegible)

SAMPLERS: (Signature)

(illegible)

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	TCLP	METALS	SVOCS	CN	TPH	VOC	REMARKS
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	3	✓	✓	✓	✓	✓		
(illegible)	10/1/15	1340	SED	4	✓	✓	✓	✓	✓	✓	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
(illegible)	10/2/15				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2013

JOB #	PROJECT NAME
15NUL20	ALCOA - DAVENPORT

SAMPLERS: (Signature) T. HUNT

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	SVOC	CN	METALS	TCL	VOC	REMARKS
SWMU-4IC-R100	10/1/95		SED	4	✓	/	✓	/	✓	✓	
SWMU-4IC-R50	10/1/95		SED	3	✓	/	/	✓	✓		
SWMU-4IC-R50	10/1/95		SED	3	/	/	/	/	/		
SWMU-4IC-R50	10/1/95		SED	3	/	/	/	/	/		
WOO3-EQUIPRIN	9/30/95		WATER	10	✓	✓	✓	✓		✓	
WOO4-EQUIPRIN	10/2/95		WATER	9	✓	✓	✓	✓		✓	
SWRA-4IC-R100	10/1/95		SED	5	✓	/	/	✓	✓		
SWRB-4IC-R100	10/1/95		SED	3	✓	/	/	✓	✓		

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/2 0100				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
15W616	ALCOA DANVILLE

SAMPLERS: (Signature) T. Hoover T. Thompson

WOODWARD-CLYDE CONSULTANTS
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FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCBs	SVOCs	METALS	CN	TOC	VOCs	REMARKS
SWMU A-[illegible] RD	10/2/15	[illegible]	SED	3	✓	✓	✓	✓	✓		ARCHIVE METALS
SWMU 15-[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓	✓	✓	✓	PHENOLS, ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓	✓	✓	✓	PHENOLS, ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓	✓	✓	✓	PHENOLS, ARCHIVE METAL
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3		✓		✓	✓	✓	PHENOLS, VOCS
[illegible]	10/2/15	[illegible]	SED	3	✓		✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS
[illegible]	10/2/15	[illegible]	SED	3	✓	✓	✓		✓		ARCHIVE METALS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[illegible]	10/3 1150				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N016	NCCA DAYTON PH I

SAMPLERS: (Signature)
T. HUNT AND T. THOMPSON

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCBs	SVOC-TCLP	METALS	TPH	Hg	CN	REMARKS
SD02A-DUP-1100	10/5/95	1440	SED	3	✓	✓	✓	✓			ARCHIVE METALS; PAHS
SD03A-DUP-1100	10/3/95	1800	SED	3	✓	✓	✓	✓			ARCHIVE METALS; PAHS
SD07A-DUP-1100	10/5/95	1500	SED	3		✓		✓	✓	✓	PHENOLS;
SD07B-DUP-1100	10/5/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD05A-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD05B-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD04A-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD04B-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD05A-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS
SD03B-DUP-1100	10/3/95	1500	SED	3		✓		✓	✓	✓	PHENOLS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	10/6 1555				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2016

JOB #	PROJECT NAME
95N116	NELLIS DAVENPORT

SAMPLERS: (Signature)
T HUNT AND T THOMPSON

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	TPH	METALS	TOX	CN	TOC	VOC	REMARKS
SOIL TO BLANK	10/1/95	1 - 4	GRAB	3	/	/	-	X	✓		ARCHIVE ONLY
W005 EQUIP BLK	10/3/95	0819	WATER	10	✓	✓	✓	✓		✓	
SOIL EQUIP BLK	10/4/95	0911	WATER	10	/	/	/	✓		✓	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/4 0911				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2017

JOB #	PROJECT NAME
15NW16	ACCOA WINDSOR

SAMPLERS: (Signature)

T. Horn, T. Hemmons

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	TCLP	MCLP	CN	NH3	TOC	SVOCS	REMARKS
SWMU A-MW-01W	10/1/15	1330	Surface	3			✓	✓	✓	✓	PHENOLS
SWMU B-MW-01W	10/1/15	1430	SCD	3			✓	✓	✓	✓	PHENOLS
SWMU A-MW-02W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-02W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-03W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU A-MW-03W	10/1/15	1530	SCD	3			✓	✓	✓	✓	PHENOLS
SWMU B-MW-04W	10/1/15	1530	SCD	3			✓	✓	✓	✓	PHENOLS
SWMU A-MW-04W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-05W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU A-MW-05W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-06W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU A-MW-06W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-07W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU A-MW-07W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU B-MW-08W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS
SWMU A-MW-08W	10/1/15	1530	SCD	3	✓	✓			✓	✓	PAHs, ARCHIVE METALS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2018

JOB #	PROJECT NAME
95N811.	ARCO - PANCENTER

SAMPLERS: (Signature)
T. Ross

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: EDB	CLOCS	METALS			TOC	REMARKS
SWMW-01-GW	10/1/95	1830	SOIL	3	✓	✓	✓	✓	✓	✓	PAH, PHENOLS, REACTIVE METALS
SWMW-02-GW	10/1/95	1834	SOIL	3	✓	✓	✓	✓	✓	✓	PAH, PHENOLS, REACTIVE METALS
SWMW-03-GW	10/1/95	1830	SOIL	3	✓	✓	✓	✓	✓	✓	REACTIVE METALS, PAH, PHENOLS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

2019

JOB #:	PROJECT NAME
95 NBW	~~FLIGHT~~ FLOOR TARGHMAN

SAMPLERS: (Signature)

T. HOWARD; T. THOMPSON

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCBs	SVOC	METALS	TOC	VOC		REMARKS
SB[illegible]-9/10-FD	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	4	✓	✓	✓	✓	✓		ARCHIVE METALS; PAHs
SB[illegible]-9/10-6-15	10/4/15	1430	SOIL	3	✓	✓	✓	✓			ARCHIVE METALS; PAHs

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2020

JOB #	PROJECT NAME
15[illegible]	ACCOA [illegible]

SAMPLERS: (Signature)

T [illegible] T [illegible]

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	[illegible]	[illegible]	METALS	TOC	VOC		REMARKS
[illegible]	10/1/15	1130	SED	4	✓	✓	✓	✓	✓		ARCHIVE METALS, PAHs
[illegible]	10/1/15	1540	SED	4	✓	✓	✓	✓	✓		ARCHIVE METALS, PAHs
[illegible]	10/1/15	1550	SED	3	✓	✓	✓	✓			ARCHIVE METALS, PAHs
[illegible]	10/1/15	1530	SED	3	✓	✓	✓	✓			ARCHIVE METALS, PAHs
[illegible]	10/1/15	1550	SED	3	✓	✓	✓	✓			ARCHIVE METALS, PAHs

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

2022

JOB #	PROJECT NAME
[illegible]	LCP - Davenport

SAMPLERS: (Signature)
Lisa Hill

ANALYSES REQUIRED

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	PCB	PAH	SVOC	TOX	Metals			REMARKS
SCOIH-02-N15	10/5/15	1021	Sed	3	✓	✓	✓	✓				
SCOIB-02-N15	10/5/15	1021	Sed	3	✓	✓	✓	✓				
SCO2H-02-N100	10/5/15	1029	Sed	3	✓	✓	✓	✓				
~~SCO2B-02-N100~~	~~10/5/15~~	~~1029~~	~~Sed~~	~~3~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~				
SCO1A-02-R00	10/5/15	1055	Sed	3	✓	✓	✓	✓				
SCO1B-02-R00	10/5/15	1055	Sed	3	✓	✓	✓	✓				
SCO1H-02-R00	10/5/15	1115	Sed	3	✓	✓	✓	✓				
SCO1H-03-R00	10/5/15	1255	Sed	3	✓	✓	✓	✓				
SCO1A-03-N100	10/5/15	1255	Sed	3	✓	✓	✓	✓				
SCO1H-03-N100	10/5/15	1304	Sed	3	✓	✓	✓	✓				
SCO3H-03-R00	10/5/15	1315	Sed	3	✓	✓	✓	✓				
SCO3B-03-R00	10/5/15	1315	Sed	3	✓	✓	✓	✓				
SCO3H-03-N15	10/5/15	1340	Sed	3	✓	✓	✓	✓				
SCO1A-03-N50	10/5/15	1358	Sed	3	✓	✓	✓	✓				

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Lisa Hill	10-5-15 1620				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED						REMARKS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						SOU3A-06-L00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						SOU3B-06-L00 Labels
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						SOU2A-01-L45 are
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						SOU1A-01-L50 incorrect
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Metal

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[illegible]	[illegible]				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2047

JOB #	PROJECT NAME
FINAL	Alcoa Bayport

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: TCLP	SVOC (PAH, Phenol)	Metals (Hg, CN)	TOC	VOC		REMARKS
SOD1A-CR-A01	10/1/95	1359	Sed	3	✓	✓	✓	✓			
SOD1A-CR-A02	10/1/95	1338	Sed	3	✓	✓	✓	✓			
SOD3A-CR-A05	10/7/95	1316	Sed	3	✓	✓	✓	✓			
SOD1A-CR-A10	10/7/95	1246	Sed	4	✓	✓	✓	✓	✓		
SOD1A-CR-A10	10/7/95	1246	Sed	4	✓	✓	✓	✓	✓		
SOD3A-CR-A15	10/7/95	1230	Sed	3	✓	✓	✓	✓			
SOD1A-CR-A15	10/7/95	1215	Sed	3	✓	✓	✓	✓			
SOD1A-CR-A20	10/7/95	1158	Sed	3	✓	✓	✓	✓			
WD09-Equip-10	10/7/95	1650	water	9	✓	✓	✓				SVOC - PAH only, CN only
WD10-Equip-10	10/7/95	1650	water	9	✓	✓	✓	✓	✓		SVOC PAH only, CN only

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/8/95 16:00				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2048

JOB #	PROJECT NAME
95N018	Air Sur - Basement

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED	REMARKS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[illegible]	[illegible]				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

N2 2049

JOB #	PROJECT NAME
95N016	ALCOA - SEDIMENT

SAMPLERS: (Signature) Todd A. Hamm

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	PAH (SVOC)	CN / METALS	TOC / VOC	TSS		REMARKS
W003-REF-RBS	10/10/95		WATER	12	✓	✓	✓	✓	✓		FILTERED & UNFILTERED
PCB-BLANK	10/10/95		WATER	1	✓						UNFILTERED
SVOC-PAH-BLANK	10/10/95		WATER	1		✓					UNFILTERED

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd A. Hamm	10/11/95 0900				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

2050

JOB # TASK 20 95N016	PROJECT NAME ALCOA SEDIMENT	ANALYSES REQUIRED	WOODWARD-CLYDE CONSULTANTS P.O. BOX 680925 FRANKLIN, TN 37068-0925 (615) 790-0003 FAX (615) 790-0023
SAMPLERS: (Signature) Todd A. Uhl			

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	PCB	PAH (SVOC)	CN / METALS	TOC / VOC	TCL / TAL		REMARKS
WW04-REF-R00	10/10/95	-	WATER	19	✓	✓	✓	✓	✓		FILTERED = UNFILTERED
PCB - BLANK	10/10/95	-	WATER	1	✓						UNFILTERED
SVOC/PAH BLANK	10/11/95	-	WATER	1		✓					UNFILTERED

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd A. Uhl	10/11/95 0930				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

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Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2051

JOB #	PROJECT NAME
95NW6	NAS Jacksonville

SAMPLERS: (Signature)

WOODWARD-CLYDE CONSULTANTS
P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	PAH	VOC (GC/MS)	VOC (TOC)	TSS	METALS	CN	REMARKS
NW05-REF-R95	10/10/95		Water	19	✓	✓	✓	✓	✓	✓		Filtered - Unfiltered
NW06-REF-R95	10/10/95		Water	19	✓	✓	-	✓	✓	✓		Filtered - Unfiltered

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/11/95 1400				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

2052

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
TASK 20 TSNJ16	NLCOM - Davenport Station

SAMPLERS: (Signature)

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	PCBs	PAH (SVOA)	Inorganics	CN	TCLP	TCLP	REMARKS
NJ01-REF-RI25-INS	10/10/95	-	Water	19	✓	✓	✓	✓	✓	✓	Filtered & Unfiltered
NJ01-REF-RI25-IND	10/10/95	-	Water	19	✓	✓	✓	✓	✓	✓	Filtered & Unfiltered

ANALYSES REQUIRED

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RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/11/95 0900				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

2059

JOB #	PROJECT NAME
95NJ16 Task 10	ALCOA - Sch. mill

SAMPLERS: (Signature) Todd D. [illegible]

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SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	SVOC	PAH	TOC	VOC	TAL Metals	CN	TSS	REMARKS
W002-REF-R25	10/11/95	-	Water	18	✓	✓	✓	✓	✓	✓	✓		Filtered & Unfiltered
W001-REF-R25	10/11/95	-	Water	18	✓	✓	✓	✓	✓	✓	✓		Filtered & Unfiltered

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd D. [illegible]	10/12/95 1200				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

NO 2060

JOB #	PROJECT NAME
95N016	ALCOA - Sediment

SAMPLERS: (Signature) Ted W. Yu

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SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: DCB	SVOC (PAH)	Metals	TOC	TSS	CN	REMARKS
W001D-01C-R10	10/11/95	-	WATER	18	✓	✓	✓	✓	✓	✓	Filtered & Unfiltered

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Ted W. Yu	10/12/95 1200				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

2061

CHAIN OF CUSTODY RECORD

JOB # Task 020 95W016	PROJECT NAME ALCOA - Scioto	ANALYSES REQUIRED	WOODWARD-CLYDE CONSULTANTS P.O. BOX 680925 FRANKLIN, TN 37068-0925 (615) 790-0003 FAX (615) 790-0023
SAMPLERS: (Signature) Todd D. Thomas			

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	SVOC/PAH	Metals	REMARKS
W006-02-R100	10/11/95	-	WATER	4	✓		
W004-02-R10	10/11/95	-	WATER	4	✓		
W001-03-R110	10/11/95	-	WATER	4	✓		RESAMPLED
W001-01A-R160	10/11/95	-	WATER	1		✓	
W001-01A-R60	10/11/95	-	WATER	1		✓	LOCATIONS
W005-03-R50	10/11/95	-	WATER	1		✓	
W016-01D-R50	10/11/95	-	WATER	1		✓	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd D. Thomas	10/12/95 12:00				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
Pink copy retained by samplers. Yellow copy retained by laboratory. Laboratory returns White copy to samplers.

CHAIN OF CUSTODY RECORD

2066

JOB #	PROJECT NAME
95N016	ALCOA - SED

SAMPLERS: (Signature)

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(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	PAH	METALS	CN	TOC	TSS		REMARKS
W001-CROW CREEK	10/12/95	-	H_2O	12	✓	✓	✓	✓	✓	✓	3	FILTERED
W001-POWELL CREEK	10/13/95	-	H_2O	18	✓	✓	✓	✓	✓	✓	3	UNFILTERED

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	10/11/95 12:00				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N016	ALCOA - SCOPING

SAMPLERS: (Signature) Todd C. Fine

WOODWARD-CLYDE CONSULTANTS
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SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	PAH (SVOC)	TAL METALS	CN	TOC		REMARKS
SD03B-006D-R00	10/13/95	-	SED	3	✓	✓	✓	✓	✓		
SD03B-006D-R00-DUP	10/13/95	-		3	✓	✓	✓	✓	✓		
SD04A-006D-R00	10/13/95	-		3	✓	✓	✓	✓	✓		
SD04B-006D-R00	10/13/95	-		3	✓	✓	✓	✓	✓		
SD04B-006D-R00-DUP	10/13/95	-		3	✓	✓	✓	✓	✓		
SD01A-CROW CREEK	10/12/95	-	SED	3	✓	✓	✓	✓	✓		ARCHIVE DETAILS
SD01B-CROW CREEK	10/12/95	-		3	✓	✓	✓	✓	✓		
SD01D-CROW CREEK-DUP	10/12/95	-		3	✓	✓	✓	✓	✓		
SD01A-PIGEON CREEK	10/12/95	-		3	✓	✓	✓	✓	✓		
SD01B-PIGEON CREEK	10/12/95	-		3	✓	✓	✓	✓	✓		
SD01B-PIGEON CREEK-DUP	10/12/95	-		3	✓	✓	✓	✓	✓		

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd C. Fine	10/16/95 12:30				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

N2 2063

JOB #	PROJECT NAME
95N01B	ALCOA - SOUTH

SAMPLERS: (Signature) Ted Lodl

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(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	PAH (SVOC)	METALS	CN	TOC		REMARKS
SOO4.5-01B-R00	10/13/95	-	SED	3	✓	✓	✓	✓	✓		
SOO4.5-01B-R00-DUP		-			✓	✓	✓	✓	✓		ARCHIVE METALS
SOO3.5-01B-R00		-			✓	✓	✓	✓	✓		
SOO3.5-01B-R00-DUP		-			✓	✓	✓	✓	✓		
SOO2.5-01B-R00		-			✓	✓	✓	✓	✓		
SOO2.5-01B-R00-DUP		-			✓	✓	✓	✓	✓		
SOO1.5-01B-R00		-			✓	✓	✓	✓	✓		
SOO1.5-01B-R00-DUP		-			✓	✓	✓	✓	✓		
SOO1A-006D-R00		-			✓	✓	✓	✓	✓		
SOO1A-006D-R00-DUP		-			✓	✓	✓	✓	✓		
SOO3A-006D-R00		-			✓	✓	✓	✓	✓		
SOO3B-006D-R00		-			✓	✓	✓	✓	✓		
SOO3B-006D-R00-DUP		-			✓	✓	✓	✓	✓		
SOO3A-006D-R00		-			✓	✓	✓	✓	✓		

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Ted Lodl	10/16/95 12:00				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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CHAIN OF CUSTODY RECORD

2065

JOB #	PROJECT NAME
95N016	ALCOA - SED

SAMPLERS: (Signature) Todd D. Yk

ANALYSES REQUIRED: PCB, PAH (SVOC), METALS, CN, TOC

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(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	REMARKS
SD01D-02-R25	10/15/95	-	SED	3	
SD01D-02-R25-DUP		-		3	
SD02D-02-R25		-		3	
SD02D-02-R25-DUP		-		3	
SD10AD-01D-R200		-		3	ARCHIVE METALS
SD10BD-01D-R200		-		3	
SD10BD-01D-R200-DUP		-		3	
SD11AD-01D-R175		-		3	
SD11AD-01D-R175-DUP		-		3	
SD12AD-01D-R200		-		3	
SD13AD-01D-R200-DUP		-		3	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd D. Yk	10/16/95 12:00				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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2149

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N016 TASK 20	ALCOA - SEDIMENT

SAMPLERS; (Signature) Ted A. Ullrich

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P.O. BOX 680925
FRANKLIN, TN 37068-0925
(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PCB	SVOC (PAH)	TOC	VOC	TOTAL CN	REMARKS
W021-EQUIPRIN	10/11/95		WATER	11	✓	✓	✓	✓	✓	✓	
W022-EQUIPRIN	10/11/95		WATER	11	✓	✓	✓	✓	✓	✓	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Ted A. Ullrich	10/17/95 14:30				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

Distribution: Original and Yellow copies accompany sample shipment to laboratory
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NO 2053

CHAIN OF CUSTODY RECORD

JOB #	PROJECT NAME
95N184 Task 20	ALCOA - SEDIMENT

SAMPLERS: (Signature) Todd D. Ahrens

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(615) 790-0003 FAX (615) 790-0023

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE	NUMBER OF CONTAINERS	ANALYSES REQUIRED: PAH	PCB	TOC				REMARKS
PAH - CHECK #1	1/8/96	1500	Water	2	✓						
PAH - CHECK #2	1/8/96	1500	Water	2	✓						Analytical Methods
											As with ALCOA - SEDIMENT
PCB - CHECK #1	1/8/96	1500	Water	2		✓					Project
PCB - CHECK #2	1/8/96	1500	Water	2		✓					
	✓										
TOC - CHECK #1	1/8/96	1530	Water	4			✓				
TOC - CHECK #2	1/8/96	1530	Water	4			✓				

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Todd D. Ahrens	1630 1/8/96				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED AT LAB BY: (Signature)	DATE/TIME	GENERAL COMMENTS	

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