REFERENCE 17

United States Army Corps of Engineers (USACE), July 1997, Analytical data Packages, Willamette River 1997 Sampling Event as a part of the Columbia River Channel Deepening.

Doc ID# 136748

Table 4, CRCD Sediment Evaluation Report

Reference 17

Columbia River Channel Deepening
Willamette River Sediment Sample Locations

Willamette River 1997 Sampling Event as part of the Columbia River Channel Deepening

Sample	Longitude	Latitude	RM	Remarks
WR-BC-1	-122:45:44.3362	45:39:13.3370	0.1	Rt. Mouth (Box Core)
WR-GC-2	-122:45:54.9805	45:39:16.5667	0.1	Lt. Mouth (Gravity Core)
WR-BC-3	-122:46:02.3906	45:39:02.1708	0.4	Lt.
WR-GC-5	-122:46:08.0703	45:38:44.7709	0.8	Rt. D/S Term 5 (-4 w/-5)
WR-GC-4	-122:46:06.7203	45:38:43.8529	0.8	Lt. D/S Term 5 (-4 w/-5)
WR-GC-6	-122:46:20.7350	45:38:42.8349	0.95	~ mid-channel
WR-BC-7	-122:46:57.3869	45:38:19.4082	1.6	~ mid-channel
WR-BC-8	-122:47:06.8303	45:38:12.1734	1.7	~ mid-channel
WR-BC-9	-122:47:16.6692	45:38:03.4129	2.05	~ mid-channel
WR-BC-10	-122:47:28.2057	45:37:41.3380	2.45	~ mid-channel
WR-BC-11	-122:47:26.2800	45:37:15.0665	2.9	~ mid-channel
WR-BC-12	-122:47:17.0763	45:36:57.6300	3.4	Rt. D/S Term 4; Composite
WR-BC-13	-122:47:11.6621	45:36:57.1153	3.4	Lt. Of C/L; Comp.-12,-14
WR-BC-14	-122:47:16.5328	45:36:52.2947	3.5	Lt. Of C/L; Comp.-12,-14
WR-BC-15	-122:47:14.0216	45:36:39.3717	3.8	Rt. Of C/L
WR-BC-16	-122:47:02.7247	45:36:23.8457	4.1	~C/L; Composite –16,-17
WR-BC-17	-122:46:58.8536	45:36:18.1072	4.4	~C/L; Composite –16,-17
WR-GC-18	-122:46:41.0228	45:36:11.5496	5.1	Rt. Of C/L
WR-GC-19	-122:46:17.4757	45:35:35.8326	5.1	Lt. Of C/L
WR-GC-20	-122:46:19.2367	45:35:30.2858	5.15	Rt. Of C/L
WR-BC-21	-122:45:45.1441	45:35:04.2830	5.9	Lt. D/S Moorings
WR-BC-22	-122:45:25.4092	45:34:53.8719	6.2	Lt. D/S Moorings
WR-BC-23	-122:45:08.0541	45:34:47.6289	6.5	~ mid-channel
WR-GC-24	-122:44:52.1496	45:34:38.5182	6.7	Rt. D/S RR Br.
WR-BC-25	-122:44:52.4081	45:34:41.5870	6.7	Lt. D/S RR Br.
WR-BC-26	-122:44:43.0783	45:34:33.8529	6.9	Lt. D/S RR Br.; Comp-26,-28
WR-BC-27	-122:44:37.7302	45:34:33.4267	7.0	Rt. D/S RR Br.; Comp-26,-28
WR-BC-28	-122:44:35.0715	45:34:29.1617	7.1	~ mid-channel; Comp-26,-28
WR-BC-29	-122:44:19.6199	45:34:19.7144	7.5	~ mid-channel
WR-BC-30	-122:43:12.1918	45:33:37.2890	8.5	Swan Is.
WR-BC-31	-122:42:50.2430	45:33:26.9055	8.9	Swan Is.
WR-GC-32	-122:41:40.8248	45:33:02.8328	10.0	Rt. D/S Turning Basin
WR-GC-33	-122:41:35.4903	45:32:55.6554	10.1	Rt. U/S Turning Basin
WR-BC-34	-122:41:48.2905	45:32:56.4872	10.0	Lt. D/S Turning Basin
WR-BC-35	-122:41:42.6042	45:32:52.9740	10.1	Rt. U/S Turning Basin
WR-BC-36	-122:41:26.2867	45:32:45.0068	10.3	~ mid-channel
WR-BC-37	-122:40:49.2764	45:32:13.2822	11.1	Lt. Of C/L
WR-GC-38	-122:40:43.1427	45:32:09.5219	11.2	C/L D/S Turning Basin
WR-BC-39	-122:40:25.7998	45:31:57.7696	11.65	C/L U/S Turning Basin
WR-CD-41	-122:40:40.4862	45:32:04.8735	11.35	Lt. D/S Trn Bsn (Core Drill)
WR-CD-40	-122:40:37.7078	45:32:08.9439	11.3	Rt. D/S Turning Basin
WR-CD-42	-122:40:35.1566	45:31:59.3912	11.5	Lt. U/S Turning Basin
WR-CD-43	-122:40:26.1315	45:32:03.1942	11.55	Rt. U/S Turning Basin

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1094776

HEADER SHEET FOR SEDIMENT SAMPLING TRIP

PROJECT LOCATION: CRCD - Willamette

SAMPLING DATE: 7/22/97 - 7/25/97

SAMPLING METHOD (PONAR/BOX CORE/GRAVITY CORE/VIBRA CORE):

SAMPLING ANALYSIS (SAMPLE NUMBERS ANALYZED)

GRAIN SIZE: WR-A → WR-GC-39z

OIL/GREASE:

AMMONIA (NH4):

SULFIDE:

TOTAL ORGANIC CARBON (TOC):

VOLATILE SOLIDS: WR-A → WR-GC-39z

METALS:

PESTICIDES:

PAH'S:

ELUTRIATES:

BIOLOGICAL:

SEDIMENT QUALITY dBASE FILES:

NPD Lab Physical data Report # 97-0213

CAS Report # 9705215

9705238

9705278

9705146

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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-A Depth: Lab No.: 213WRA

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	68.26	95.0
5/16 In.	142.63	89.6
No. 5	166.40	87.9
No. 10	188.40	86.3
Pan	1377.40	0.0
No. 18	4.97	81.5
No. 35	15.15	71.6
No. 60	42.36	45.2
No. 120	71.12	17.4
No. 230	81.38	7.4
Pan	89.02	0.0

No hydrometer analysis.

$\bar{x} = .647$

D85: 1.55 D60: 0.36 D50: 0.28 D30: 0.18 D15: 0.11 D10: .087 mm

Cu: 4.10 Cc: 0.99

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 11.9% Sand: 79.8% Fines: 8.3%

---------- ASTM D 2487 Classification ----------

SP-SM Poorly graded SAND with silt

---------- Comments ----------

-Date sampled: 7-24-97

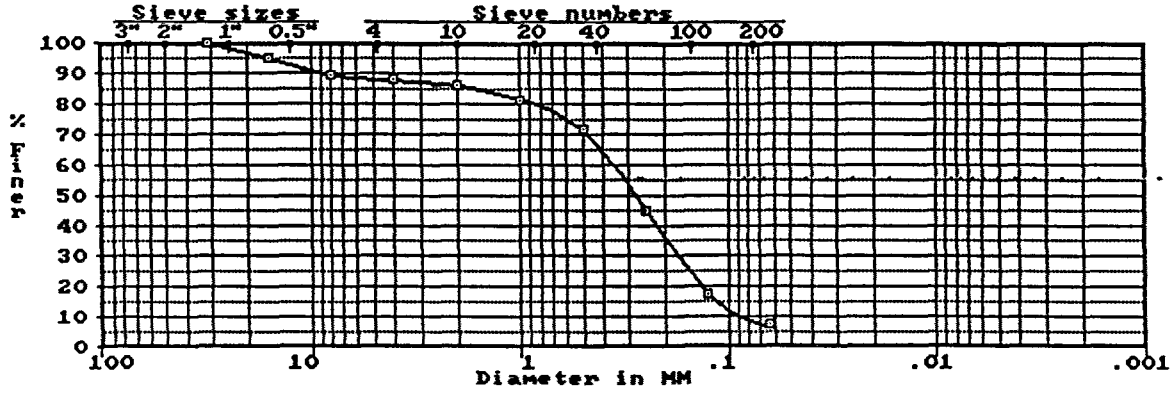
-Time: 13:30

-Specific gravity: 2.678

-Roundness grading: subangular to subrounded

-Volatile solids: 0.9%

Percent finer than 0.02 mm unknown, therefore no frost classification.



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-C Depth: Lab No.: 213WRC

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.57	100.0
No. 10	0.63	100.0
Pan	1483.30	0.0
No. 18	0.00	100.0
No. 35	3.61	94.9
No. 60	21.64	69.9
No. 120	29.13	59.5
No. 230	43.31	39.9
Pan	72.04	0.0

---------- Hydrometer Analysis ----------

Sample Weight:72.04 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	23.6	0.0472	33.1
3	20.0	16.1	0.0286	22.8
10	20.0	8.2	0.0164	11.9
100	20.0	3.1	0.0069	4.9
200	20.0	1.6	0.0049	2.9

$\bar{y} = .163$

D85: 0.38 D60: 0.13 D50: .089 D30: .041 D15: .019 D10: .014 mm

Cu: 9.34 Cc: 0.93

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 54.9% Fines: 45.1%

---------- ASTM D 2487 Classification ----------

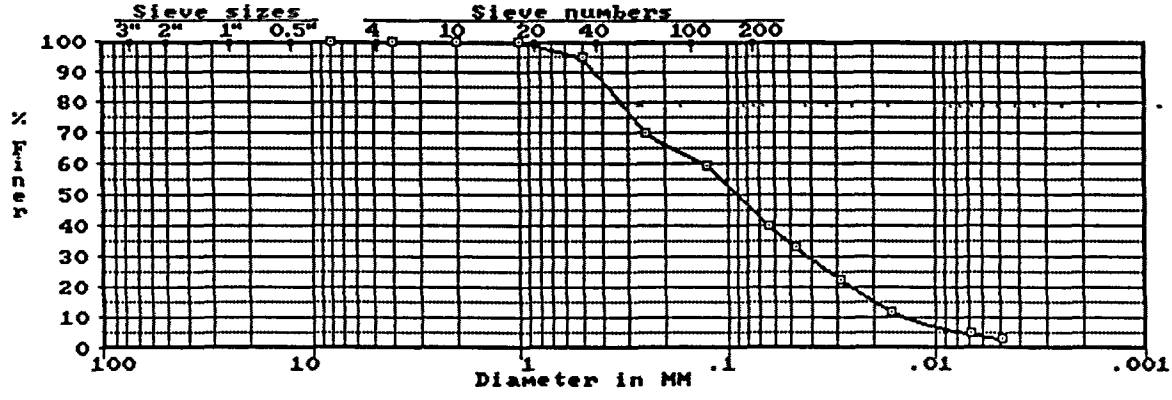
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 15.5 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-25-97
-Time: 10:29
-Specific gravity: 2.572
-Roundness grading: subangular-subrounded
-Volatile solids: 4.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-01 Depth: Lab No.: 213WR01

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	39.23	97.3
5/16 In.	89.08	93.9
No. 5	107.53	92.6
No. 10	136.14	90.7
Pan	1459.10	0.0
No. 18	5.27	85.1
No. 35	18.60	71.2
No. 60	46.75	41.7
No. 120	74.05	13.1
No. 230	81.54	5.2
Pan	86.51	0.0

No hydrometer analysis.

$\bar{y} = .473$

D85: 0.99 D60: 0.38 D50: 0.30 D30: 0.19 D15: 0.13 D10: .096 mm

Cu: 3.94 Cc: 1.05

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 7.1% Sand: 85.6% Fines: 7.2%

---------- ASTM D 2487 Classification ----------

SP-SM Poorly graded SAND with silt

---------- Comments ----------

-Date sampled: 7-24-97

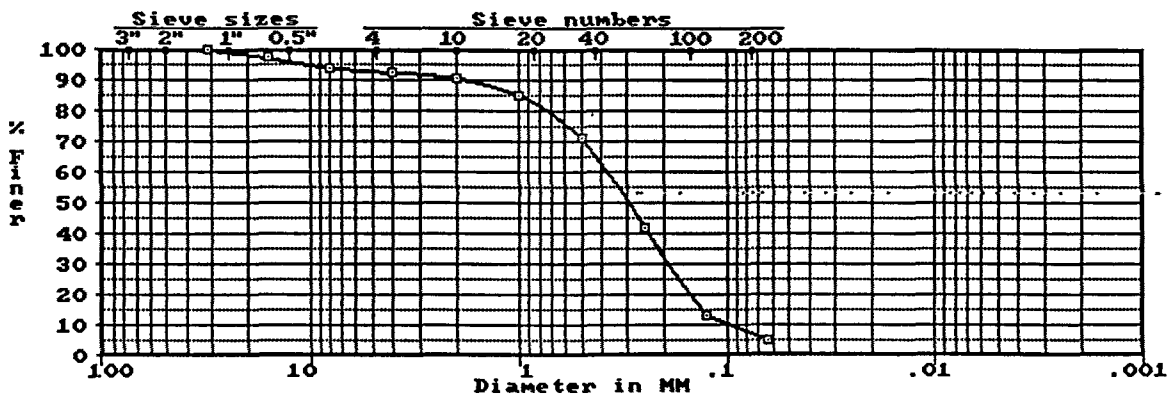
-Time: 13:30

-Specific gravity: 2.661

-Roundness grading: subangular to subrounded

-Volatile solids: 0.8%

Percent finer than 0.02 mm unknown, therefore no frost classification.



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-07 Depth: Lab No.: 213WR07

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	1.18	99.9
Pan	1213.00	0.0
No. 18	0.00	99.9
No. 35	0.18	99.7
No. 60	1.14	98.4
No. 120	4.80	93.5
No. 230	18.49	75.3
Pan	75.15	0.0

Hydrometer Analysis

Sample Weight: 75.15 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	42.1	0.0411	56.1
3	20.0	27.6	0.0265	37.0
10	20.0	14.6	0.0158	19.9
100	20.0	5.1	0.0068	7.4
200	20.0	3.1	0.0049	4.7

$\bar{X}$ = .044

D85: .085 D60: .045 D50: .036 D30: .022 D15: .012 D10: .0090 mm

Cu: 4.98 Cc: 1.21

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 18.7% Fines: 81.3%

ASTM D 2487 Classification

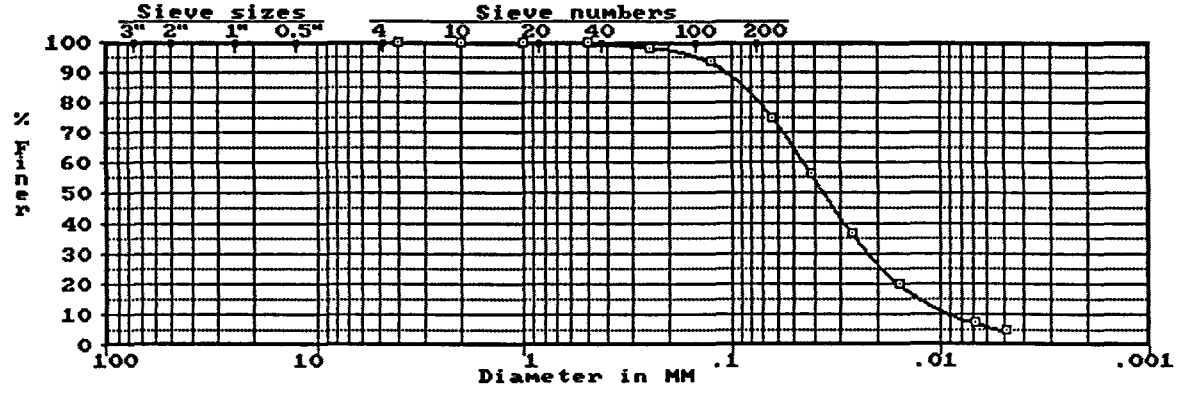
ML SILT with sand

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 26.8 Frost Classification: F4

Comments

-Date sampled: 7-24-97
-Time: 12:03
-Specific gravity: 2.582
-Roundness grading: subrounded
-Volatile solids: 4.2%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-09 Depth: Lab No.: 213WR09

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	1238.80	0.0
No. 18	0.00	100.0
No. 35	0.22	99.7
No. 60	1.70	97.7
No. 120	11.66	84.2
No. 230	22.85	69.1
Pan	73.98	0.0

---------- Hydrometer Analysis ----------

Sample Weight:73.98 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	38.6	0.0423	52.3
3	20.0	26.1	0.0268	35.6
10	20.0	12.6	0.0160	17.5
100	20.0	5.6	0.0068	8.2
200	20.0	3.6	0.0048	5.5

$\bar{x}$=.061

D85: 0.13 D60: .051 D50: .040 D30: .023 D15: .014 D10: .0094 mm

Cu: 5.38 Cc: 1.14

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 26.1% Fines: 73.9%

---------- ASTM D 2487 Classification ----------

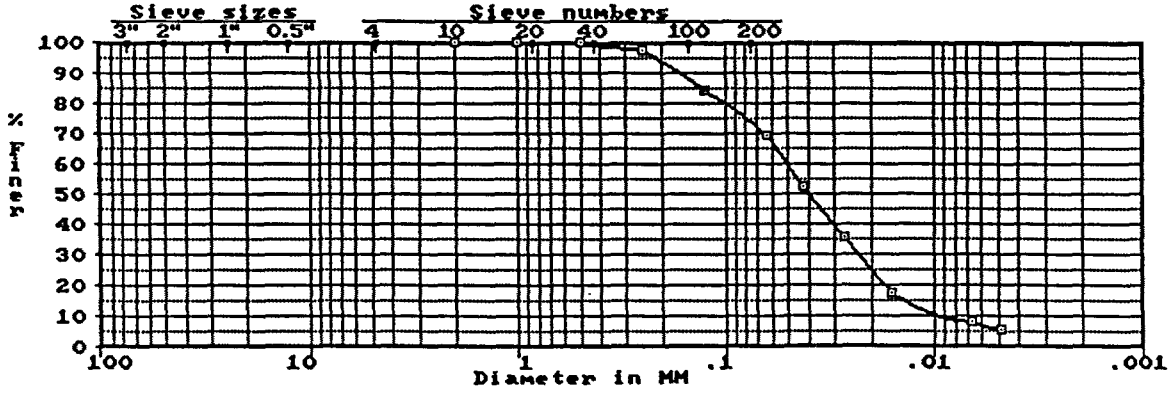
ML SILT with sand

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 24.7 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-24-97
-Time: 11:00
-Specific gravity: 2.574
-Roundness grading: subrounded
-Volatile solids: 3.9%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-12 Depth: Lab No.: 213WR12

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	2.95	99.8
No. 5	2.95	99.8
No. 10	3.75	99.8
Pan	1528.00	0.0
No. 18	0.18	99.5
No. 35	6.39	91.0
No. 60	25.04	65.6
No. 120	37.53	48.6
No. 230	45.16	38.2
Pan	73.13	0.0

$\bar{x}$ = .188

---------- Hydrometer Analysis ----------

Sample Weight:73.13 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	23.2	0.0474	32.0
3	20.0	18.2	0.0282	25.3
10	20.0	12.7	0.0160	17.8
100	20.0	5.7	0.0068	8.4
200	20.0	3.7	0.0048	5.7

D85: 0.42 D60: 0.21 D50: 0.13 D30: .041 D15: .013 D10: .0080 mm

Cu: 25.6 Cc: 1.05

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.2% Sand: 59.0% Fines: 40.8%

---------- ASTM D 2487 Classification ----------

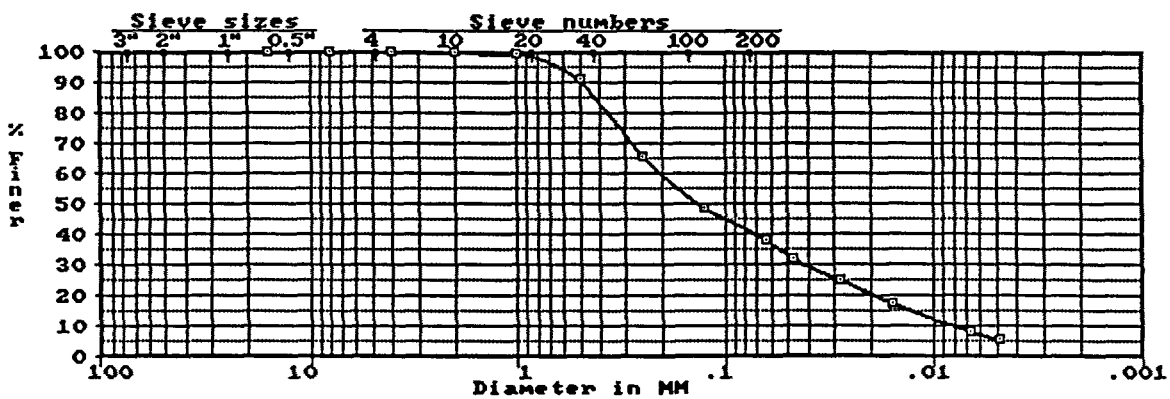
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 20.7 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-24-97
-Time: 14:46; 15:04; 15:27
-Specific gravity: 2.594
-Roundness grading: subrounded
-Volatile solids: 3.5%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-16 Depth: Lab No.: 213WR16

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	2.46	99.8
Pan	1568.70	0.0
No. 18	0.87	99.0
No. 35	8.45	91.4
No. 60	66.29	33.4
No. 120	78.69	20.9
No. 230	80.49	19.1
Pan	99.58	0.0

$\bar{x} = .266$

---------- Hydrometer Analysis ----------

Sample Weight:99.58 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	16.1	0.0495	16.5
3	20.0	13.6	0.0290	14.0
10	20.0	9.1	0.0163	9.5
100	20.0	3.6	0.0069	4.1
200	20.0	1.6	0.0049	2.1

D85: 0.46 D60: 0.34 D50: 0.30 D30: 0.21 D15: .037 D10: .017 mm

Cu: 19.8 Cc: 7.23

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 80.5% Fines: 19.5%

---------- ASTM D 2487 Classification ----------

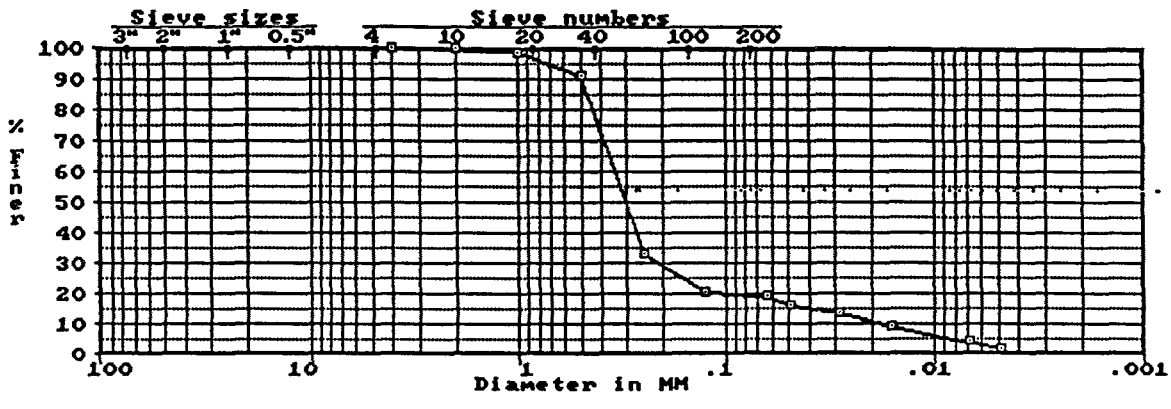
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 11.2 Frost Classification: F2

---------- Comments ----------

-Date sampled: 7-24-97
-Time: 16:10; 16:45
-Specific gravity: 2.636
-Roundness grading: subangular-subrounded
-Volatile solids: 1.4%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-21 Depth: Lab No.: 213WR21

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	31.78	98.7
Pan	2496.30	0.0
No. 18	3.54	95.2
No. 35	33.04	65.5
No. 60	93.40	4.7
No. 120	95.53	2.5
No. 230	96.15	1.9
Pan	98.03	0.0

No hydrometer analysis.

$\bar{x} = .477$

D85: 0.73 D60: 0.47 D50: 0.42 D30: 0.34 D15: 0.28 D10: 0.27 mm

Cu: 1.77 Cc: 0.92

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 97.9% Fines: 2.1%

---------- ASTM D 2487 Classification ----------

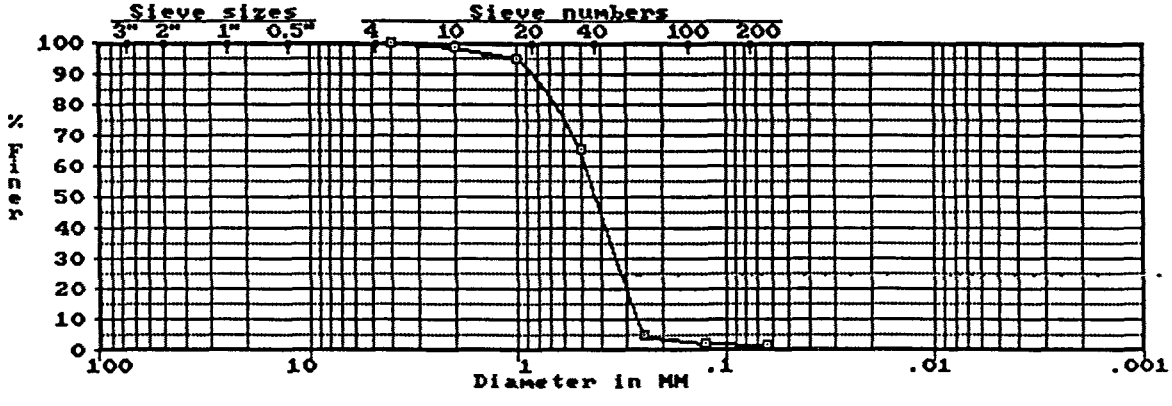
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

---------- Comments ----------

-Date sampled: 7-25-97
-Time: 13:57
-Specific gravity: 2.681
-Roundness grading: subangular to sub rounded
-Volatile solids: 1.4%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-23 Depth: Lab No.: 213WR23

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	9.78	99.6
No. 10	28.67	98.9
Pan	2574.00	0.0
No. 18	1.18	97.6
No. 35	21.77	75.6
No. 60	85.93	7.0
No. 120	91.15	1.4
No. 230	91.87	0.6
Pan	92.47	0.0

No hydrometer analysis.

F=.42

D85: 0.60 D60: 0.43 D50: 0.39 D30: 0.32 D15: 0.27 D10: 0.26 mm

Cu: 1.67 Cc: 0.91

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.3% Sand: 98.9% Fines: 0.8%

---------- ASTM D 2487 Classification ----------

SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: **NFS**

---------- Comments ----------

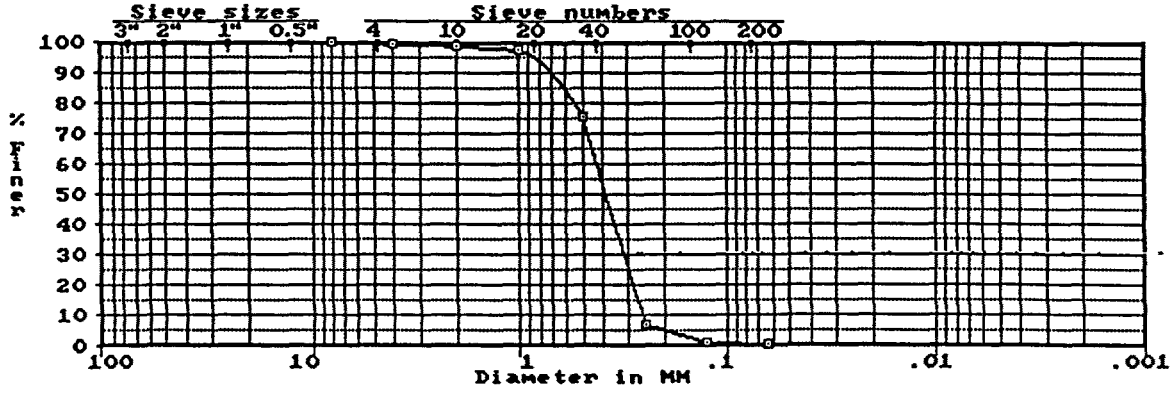
-Date sampled: 7-25-97

-Time: 12:59

-Specific gravity: 2.693

-Roundness grading: subangular to subrounded

-Volatile solids: 1.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-29 Depth: Lab No.: 213WR29

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	1.38	99.9
Pan	1651.10	0.0
No. 18	0.00	99.9
No. 35	5.14	94.0
No. 60	28.16	67.3
No. 120	37.07	57.0
No. 230	49.99	42.0
Pan	86.22	0.0

$\bar{x} = .166$

Hydrometer Analysis

Sample Weight: 86.22 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	25.6	0.0466	29.9
3	20.0	16.1	0.0286	19.0
10	20.0	9.6	0.0163	11.6
100	20.0	4.1	0.0068	5.3
200	20.0	1.6	0.0049	2.4

D85: 0.39 D60: 0.16 D50: .085 D30: .047 D15: .022 D10: .013 mm

Cu: 11.9 Cc: 1.02

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 53.1% Fines: 46.9%

ASTM D 2487 Classification

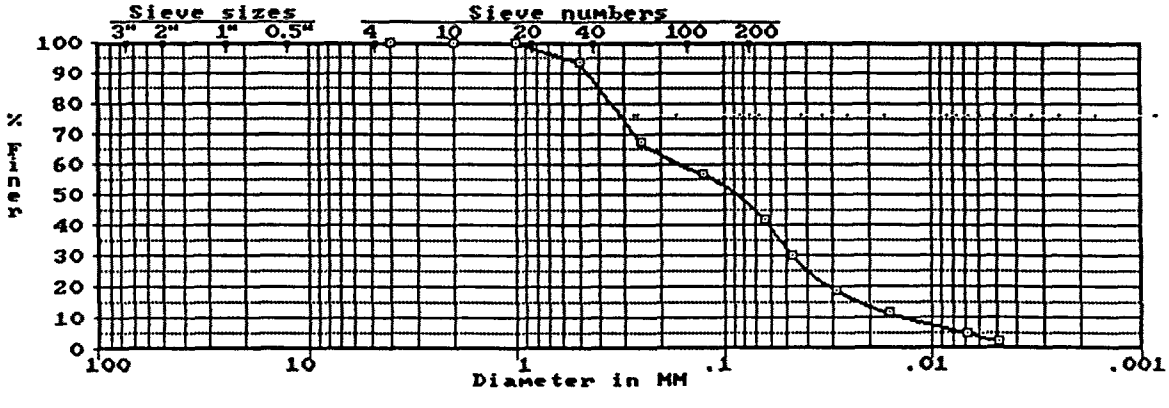
SM Silty SAND

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 13.8 Frost Classification: F2

Comments

-Date sampled: 7-25-97
-Time: 10:29
-Specific gravity: 2.610
-Roundness grading: subangular-subrounded
-Volatile solids: 3.9%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-40A Depth: Lab No.: 213WR40A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	5.61	99.5
No. 5	29.19	97.3
No. 10	82.31	92.3
Pan	1065.30	0.0
No. 18	10.51	82.9
No. 35	66.42	32.9
No. 60	100.20	2.6
No. 120	102.70	0.4
No. 230	102.97	0.2
Pan	103.14	0.0

No hydrometer analysis.

$\bar{x} = .77$

D85: 1.17 D60: 0.71 D50: 0.62 D30: 0.48 D15: 0.36 D10: 0.31 mm

Cu: 2.27 Cc: 1.01

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 1.9% Sand: 97.8% Fines: 0.3%

---------- ASTM D 2487 Classification ----------

SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

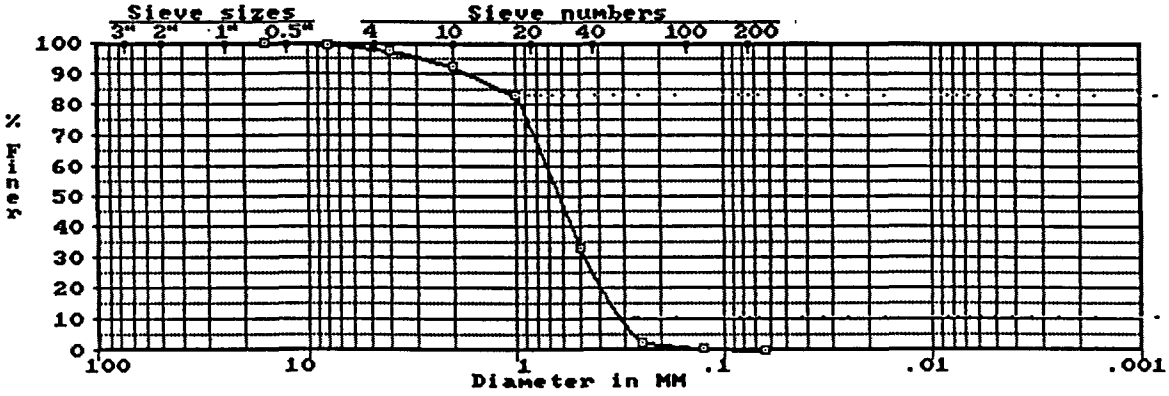
---------- Comments ----------

-Date sampled: 7-24-97

-Specific gravity: 2.653

-Roundness grading: subangular to subrounded

-Volatile solids: 1.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-41B Depth: Lab No.: 213WR41B

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	1.00	99.6
Pan	223.54	0.0
No. 18	0.15	99.2
No. 35	2.09	94.8
No. 60	14.54	66.6
No. 120	23.84	45.5
No. 230	26.97	38.4
Pan	43.91	0.0

---------- Hydrometer Analysis ----------

Sample Weight:43.91 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	13.6	0.0503	31.6
3	20.0	9.6	0.0297	22.7
10	20.0	7.1	0.0165	17.1
100	20.0	2.1	0.0069	5.8
200	20.0	1.1	0.0049	3.6

$\bar{X} = .181$

D85: 0.38 D60: 0.21 D50: 0.15 D30: .047 D15: .014 D10: .0097 mm

Cu: 21.4 Cc: 1.08

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 59.5% Fines: 40.5%

---------- ASTM D 2487 Classification ----------

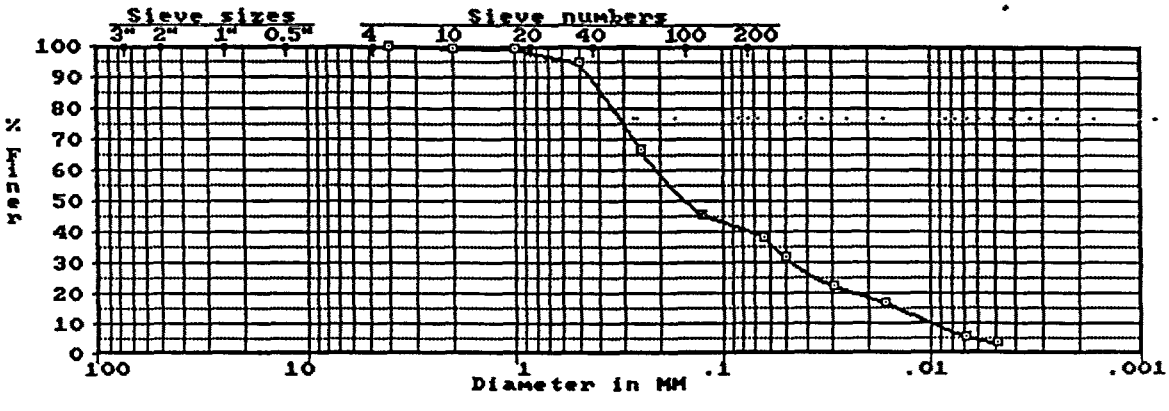
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 18.8 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.518
-Roundness grading: subrounded
-Volatile solids: 5.2%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-42A Depth: Lab No.: 213WR42A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	589.94	0.0
No. 18	0.09	99.9
No. 35	0.91	98.5
No. 60	4.95	92.0
No. 120	25.42	59.0
No. 230	37.45	39.6
Pan	61.97	0.0

$\bar{X} = .117$

---------- Hydrometer Analysis ----------

Sample Weight: 61.97 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	23.6	0.0472	38.5
3	20.0	9.6	0.0297	16.1
10	20.0	5.6	0.0166	9.7
100	20.0	3.1	0.0069	5.8
200	20.0	1.1	0.0049	2.6

D85: 0.21 D60: 0.13 D50: .098 D30: .039 D15: .027 D10: .017 mm

Cu: 7.46 Cc: 0.70

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 57.2% Fines: 42.8%

---------- ASTM D 2487 Classification ----------

SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 11.7 Frost Classification: F2

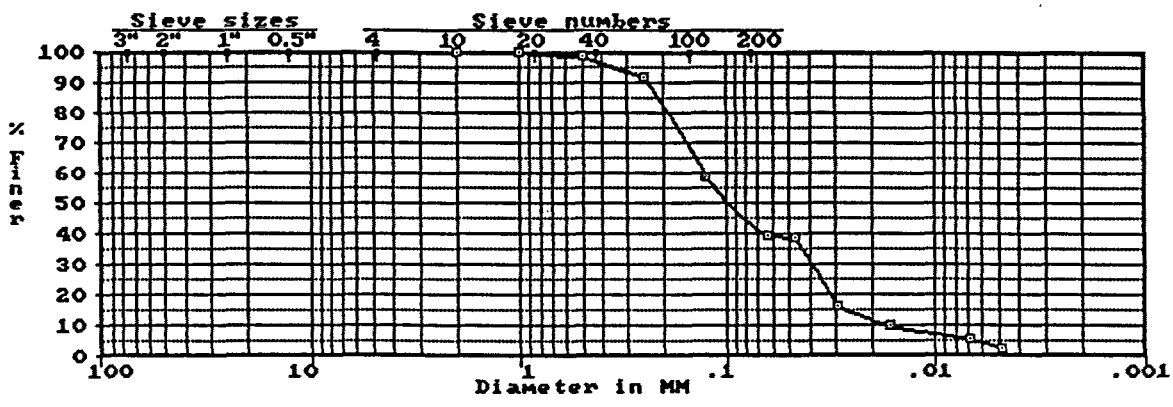
---------- Comments ----------

-Date sampled: 7-23-97

-Specific gravity: 2.618

-Roundness grading: subrounded

-Volatile solids: 4.7%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-42C Depth: Lab No.: 213WR42C

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.46	99.9
Pan	760.30	0.0
No. 18	0.00	99.9
No. 35	0.74	98.9
No. 60	15.11	78.6
No. 120	38.28	45.9
No. 230	45.35	36.0
Pan	70.85	0.0

$\bar{x} = .053$

---------- Hydrometer Analysis ----------

Sample Weight: 70.85 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	18.7	0.0487	26.8
3	20.0	13.7	0.0290	19.8
10	20.0	9.2	0.0163	13.6
100	20.0	3.7	0.0069	5.9
200	20.0	2.7	0.0049	4.5

D85: 0.30 D60: 0.17 D50: 0.14 D30: .053 D15: .019 D10: .011 mm

Cu: 14.9 Cc: 1.45

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 61.5% Fines: 38.5%

---------- ASTM D 2487 Classification ----------

SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 15.7 Frost Classification: F4

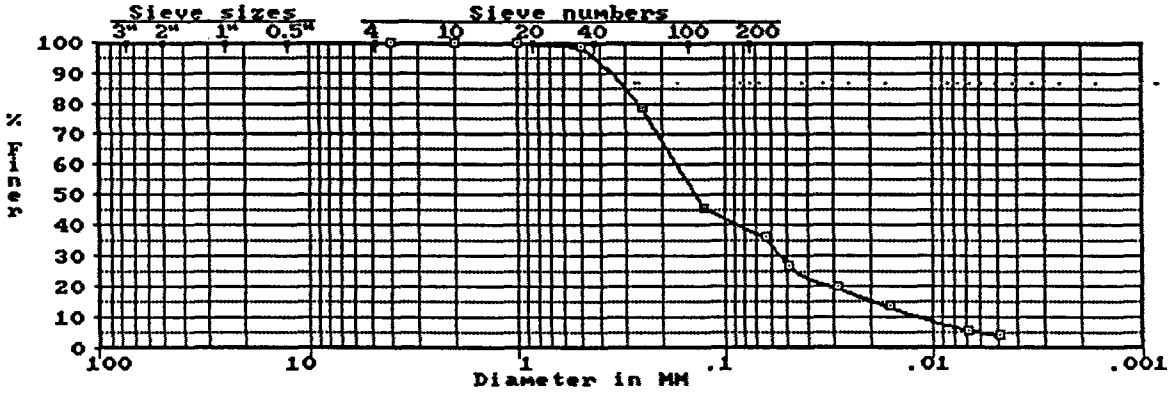
---------- Comments ----------

-Date sampled: 7-23-97

-Specific gravity: 2.580

-Roundness grading: subrounded

-Volatile solids: 5.5%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-43A Depth: Lab No.: 213WR43A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	11.83	98.7
5/16 In.	44.67	94.9
No. 5	61.58	93.0
No. 10	82.27	90.7
Pan	881.60	0.0
No. 18	3.28	87.7
No. 35	22.14	71.0
No. 60	89.13	11.3
No. 120	101.09	0.7
No. 230	101.60	0.2
Pan	101.86	0.0

No hydrometer analysis.

$\bar{x} = .477$

D85: 0.78 D60: 0.44 D50: 0.39 D30: 0.31 D15: 0.26 D10: 0.23 mm

Cu: 1.92 Cc: 0.96

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 6.6% Sand: 93.1% Fines: 0.3%

---------- ASTM D 2487 Classification ----------

SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: **NFS**

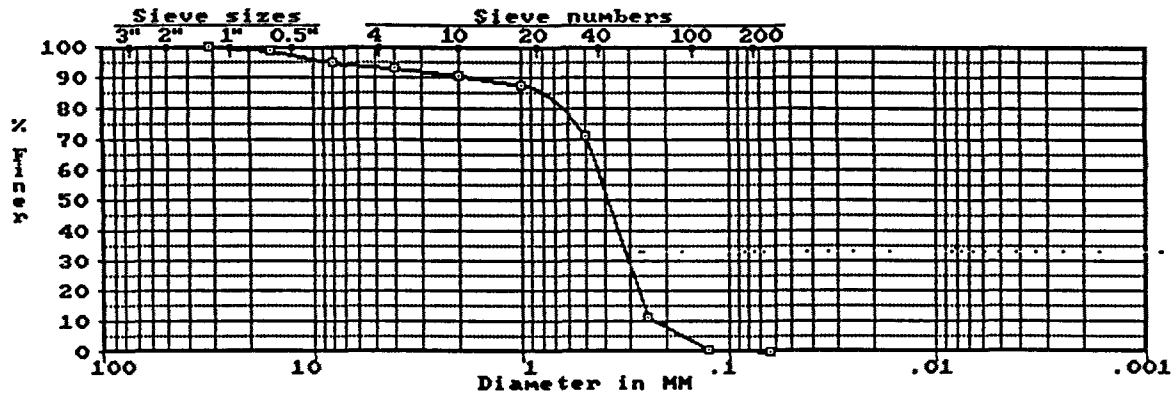
---------- Comments ----------

-Date sampled: 7-23-97

-Specific gravity: 2.655

-Roundness grading: subangular to subrounded

-Volatile solids: 1.5%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-CD-43Z Depth: Lab No.: 213WR43Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	78.24	91.5
5/16 In.	225.94	75.4
No. 5	350.40	61.8
No. 10	416.93	54.6
Pan	917.81	0.0
No. 18	10.76	48.8
No. 35	37.18	34.5
No. 60	92.15	4.7
No. 120	100.33	0.3
No. 230	100.68	0.1
Pan	100.86	0.0

No hydrometer analysis.

$\bar{x} = 4.447$

D85: 11.9 D60: 3.47 D50: 1.12 D30: 0.45 D15: 0.32 D10: 0.29 mm

Cu: 12.2 Cc: 0.21

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 35.3% Sand: 64.6% Fines: 0.2%

---------- ASTM D 2487 Classification ----------

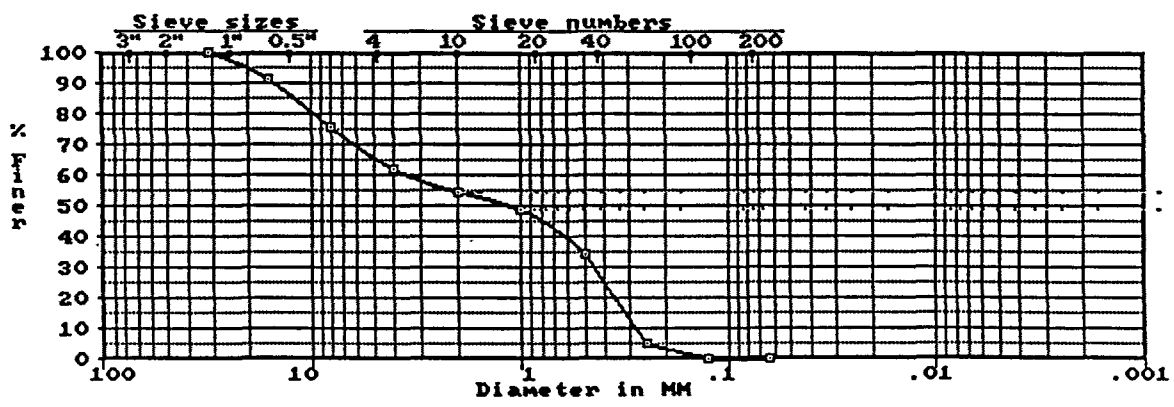
SP Poorly graded SAND with gravel

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.676
-Roundness grading: subangular to subrounded
-Volatile solids: 1.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-02B Depth: Lab No.: 213WR02B

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	13.42	98.3
No. 10	45.01	94.3
Pan	787.10	0.0
No. 18	9.45	84.7
No. 35	23.98	69.9
No. 60	51.50	41.9
No. 120	83.60	9.3
No. 230	90.37	2.4
Pan	92.78	0.0

No hydrometer analysis.

$\bar{X} = .487$

D85: 1.02 D60: 0.38 D50: 0.30 D30: 0.20 D15: 0.14 D10: 0.13 mm

Cu: 3.00 Cc: 0.82

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 1.1% Sand: 94.7% Fines: 4.2%

---------- ASTM D 2487 Classification ----------

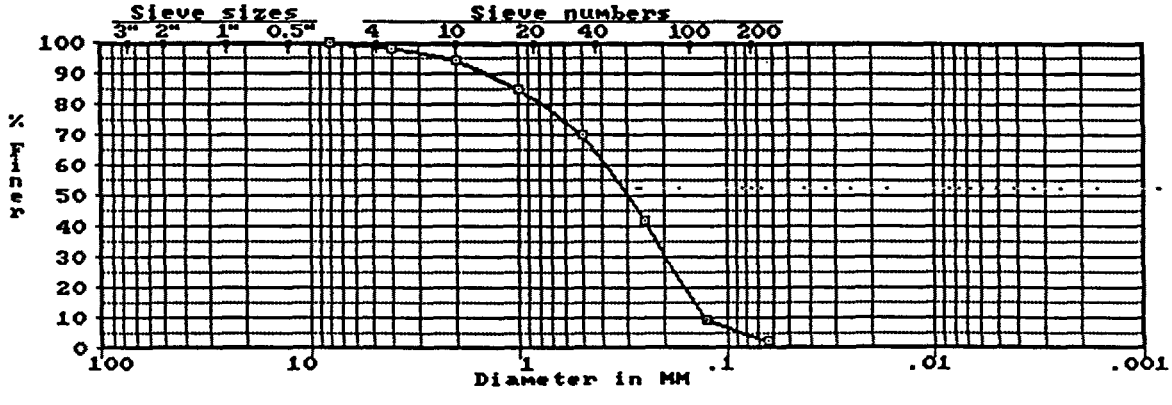
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.663
-Roundness grading: subangular to subrounded
-Volatile solids: 0.7%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-04B Depth: Lab No.: 213WR04B

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.61	99.9
Pan	451.00	0.0
No. 18	0.12	99.7
No. 35	0.87	98.5
No. 60	3.04	95.0
No. 120	7.85	87.4
No. 230	16.95	73.0
Pan	63.05	0.0

Hydrometer Analysis

Sample Weight: 63.05 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	37.1	0.0428	59.0
3	20.0	25.6	0.0269	40.9
10	20.0	14.6	0.0158	23.7
100	20.0	5.6	0.0068	9.6
200	20.0	3.1	0.0049	5.6

$\bar{x} = .057$

D85: 0.11 D60: .044 D50: .034 D30: .020 D15: .010 D10: .0070 mm

Cu: 6.23 Cc: 1.24

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 22.4% Fines: 77.6%

ASTM D 2487 Classification

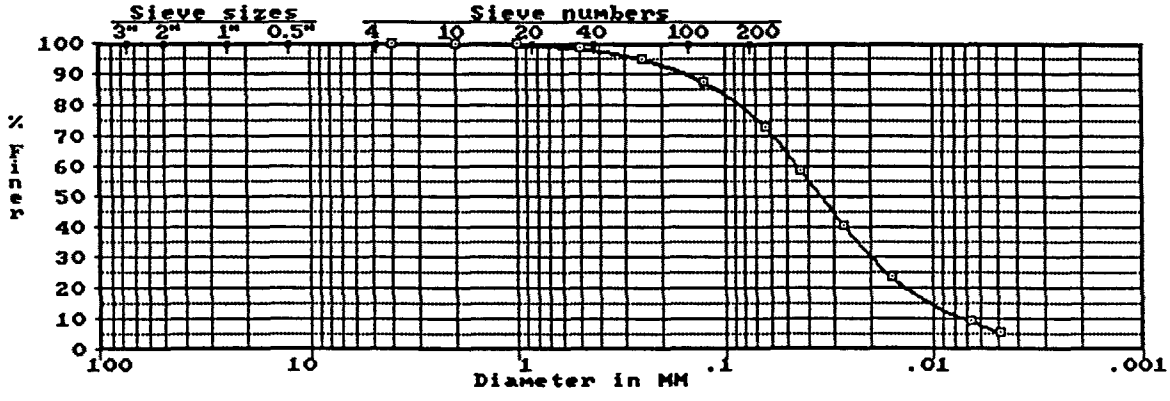
ML SILT with sand

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 30.7 Frost Classification: F4

Comments

-Date sampled: 7-24-97
-Specific gravity: 2.560
-Roundness grading: subrounded
-Volatile solids: 3.6%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-05A Depth: Lab No.: 213WR05A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	533.57	0.0
No. 18	0.07	99.9
No. 35	0.42	99.4
No. 60	2.08	96.9
No. 120	7.38	89.0
No. 230	16.80	74.9
Pan	66.88	0.0

$\bar{x} = .045$

---------- Hydrometer Analysis ----------

Sample Weight:66.88 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	41.6	0.0413	62.3
3	20.0	32.6	0.0256	49.0
10	20.0	20.6	0.0152	31.2
100	20.0	8.1	0.0067	12.7
200	20.0	4.6	0.0048	7.5

D85: .099 D60: .038 D50: .027 D30: .015 D15: .0076 D10: .0057 mm

Cu: 6.65 Cc: 0.99

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 20.8% Fines: 79.2%

---------- ASTM D 2487 Classification ----------

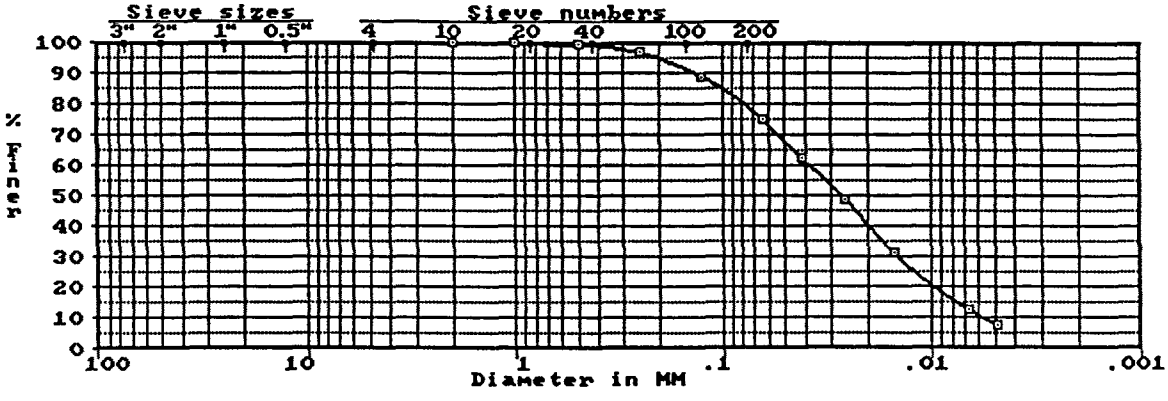
ML SILT with sand

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 40.5 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-24-97
-Specific gravity: 2.548
-Roundness grading: subrounded
-Volatile solids: 3.6%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-06A Depth: Lab No.: 213WR06A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	389.44	0.0
No. 18	0.00	100.0
No. 35	0.48	99.2
No. 60	1.35	97.8
No. 120	4.47	92.7
No. 230	17.20	71.8
Pan	60.93	0.0

Hydrometer Analysis

Sample Weight: 60.93 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	42.6	0.0409	70.0
3	20.0	24.6	0.0271	40.8
10	20.0	12.1	0.0160	20.5
100	20.0	2.6	0.0069	5.0
200	20.0	1.1	0.0049	2.6

$\bar{X} = .047$

D85: .098 D60: .035 D50: .031 D30: .021 D15: .013 D10: .010 mm

Cu: 3.45 Cc: 1.28

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 23.2% Fines: 76.8%

ASTM D 2487 Classification

ML SILT with sand

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 27.4 Frost Classification: F4

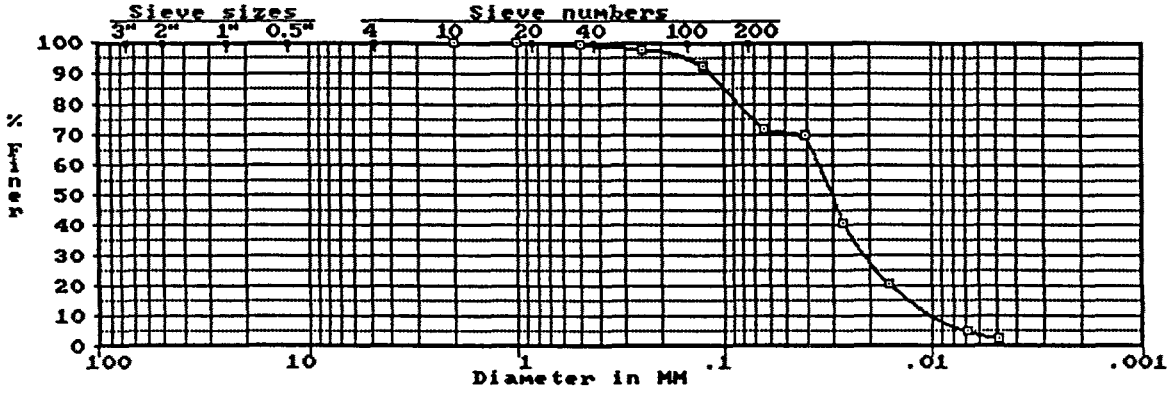
Comments

-Date sampled: 7-24-97

-Specific gravity: 2.398

-Roundness grading: subrounded

-Volatile solids: 2.6%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-06Z Depth: Lab No.: 213WR06Z

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	511.34	0.0
No. 18	0.06	99.9
No. 35	0.14	99.7
No. 60	0.35	99.3
No. 120	0.56	98.9
No. 230	3.15	93.9
Pan	51.45	0.0

Hydrometer Analysis

Sample Weight: 51.45 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	44.1	0.0404	85.8
3	20.0	36.6	0.0248	71.4
10	20.0	15.6	0.0157	31.0
100	20.0	2.1	0.0069	5.0
200	20.0	1.1	0.0049	3.1

$\bar{x} = .023$

D85: .038 D60: .022 D50: .019 D30: .015 D15: .011 D10: .0096 mm

Cu: 2.26 Cc: 1.14

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 4.2% Fines: 95.8%

ASTM D 2487 Classification

ML SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 52.8 Frost Classification: F4

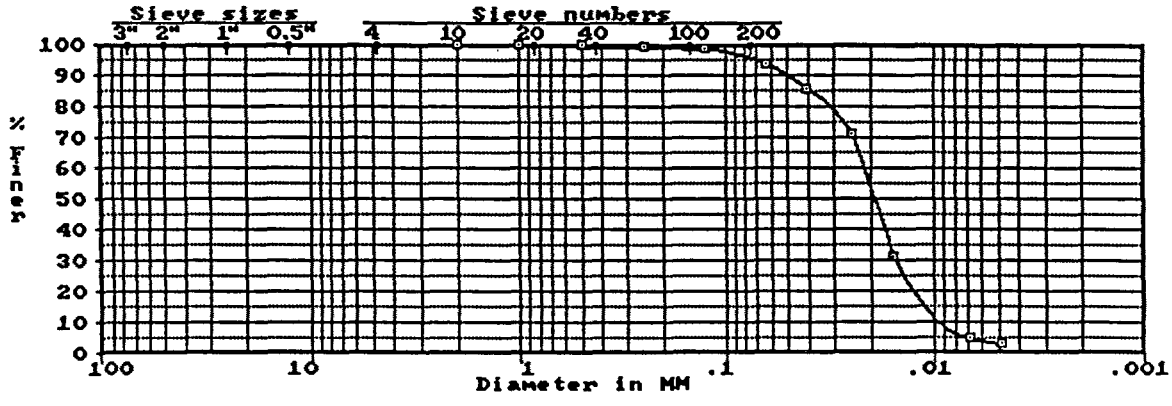
Comments

-Date sampled: 7-24-97

-Specific gravity: 2.382

-Roundness grading: subrounded

-Volatile solids: 2.5%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-11Z Depth: Lab No.: 213WR11Z

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	693.80	0.0
No. 18	0.00	100.0
No. 35	0.07	99.9
No. 60	1.06	98.5
No. 120	5.24	92.6
No. 230	13.23	81.3
Pan	70.87	0.0

$\bar{X} = .036$

Hydrometer Analysis

Sample Weight: 70.87 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	44.2	0.0403	62.4
3	20.0	33.2	0.0255	47.1
10	20.0	22.2	0.0151	31.7
100	20.0	8.7	0.0067	12.9
200	20.0	4.2	0.0048	6.6

D85: .073 D60: .038 D50: .028 D30: .014 D15: .0074 D10: .0058 mm

Cu: 6.53 Cc: 0.92

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 14.5% Fines: 85.5%

ASTM D 2487 Classification

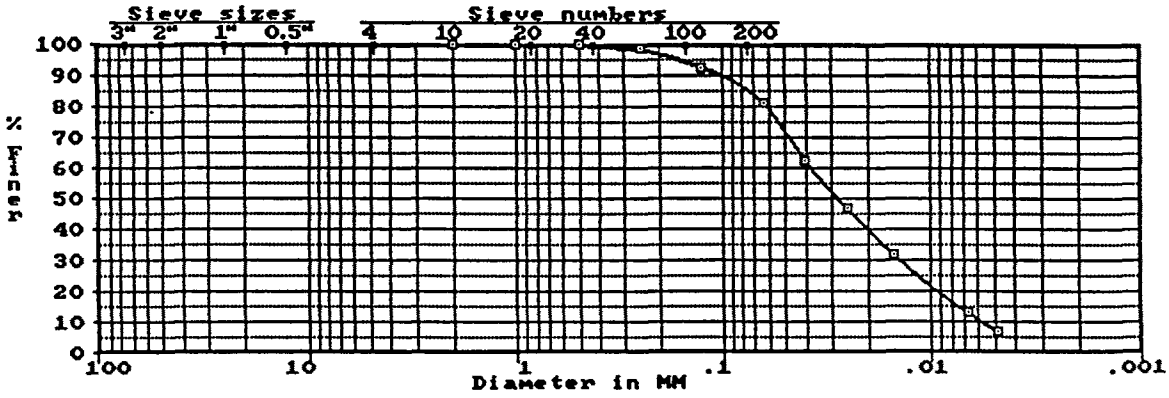
ML SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 39.7 Frost Classification: F4

Comments

-Date sampled: 7-24-97
-Specific gravity: 2.588
-Roundness grading: subrounded
-Volatile solids: 4.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-18Z Depth: Lab No.: 213WR18Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.57	99.9
Pan	597.80	0.0
No. 18	0.00	99.9
No. 35	1.61	97.5
No. 60	6.78	89.7
No. 120	14.50	78.0
No. 230	24.49	62.9
Pan	66.14	0.0

$\bar{x} = .079$

---------- Hydrometer Analysis ----------

Sample Weight:66.14 gr. Start Time:

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	32.1	0.0445	48.7
3	20.0	22.6	0.0275	34.5
10	20.0	13.1	0.0159	20.3
100	20.0	6.1	0.0068	9.9
200	20.0	2.6	0.0049	4.6

D85: 0.18 D60: .059 D50: .046 D30: .023 D15: .011 D10: .0068 mm

Cu: 8.57 Cc: 1.37

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 32.3% Fines: 67.7%

---------- ASTM D 2487 Classification ----------

ML Sandy SILT

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 25.8 Frost Classification: F4

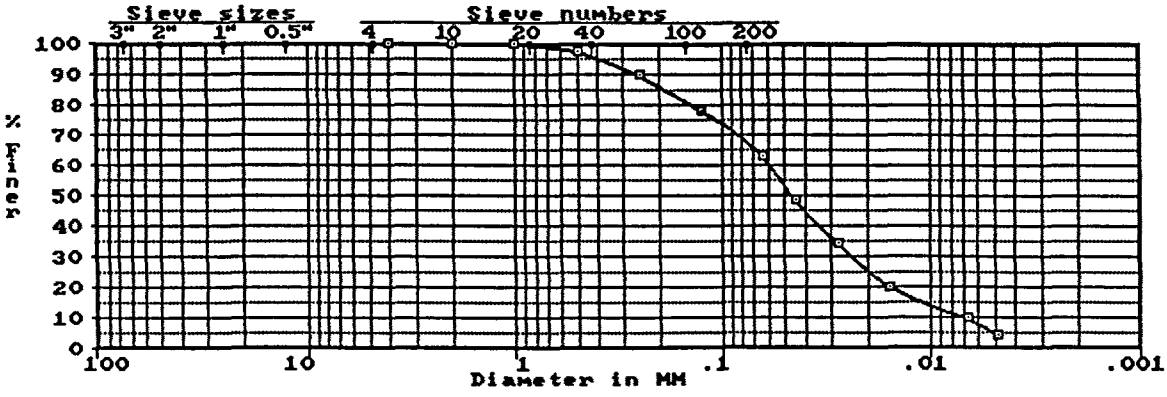
---------- Comments ----------

-Date sampled: 7-22-97

-Specific gravity: 2.538

-Roundness grading: subrounded

-Volatile solids: 7.0%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-24A Depth: Lab No.: 213WR24A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	8.37	98.9
Pan	747.80	0.0
No. 18	0.48	98.3
No. 35	2.59	95.7
No. 60	11.82	84.5
No. 120	30.53	61.8
No. 230	49.85	38.4
Pan	81.48	0.0

$\bar{x} = .124$

Hydrometer Analysis

Sample Weight: 81.48 gr. Start Time:

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	24.1	0.0471	29.6
3	20.0	15.1	0.0288	18.7
10	20.0	9.1	0.0163	11.5
100	20.0	3.1	0.0069	4.3
200	20.0	2.6	0.0049	3.7

D85: 0.26 D60: 0.12 D50: .089 D30: .048 D15: .022 D10: .014 mm

Cu: 8.30 Cc: 1.34

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 55.8% Fines: 44.2%

ASTM D 2487 Classification

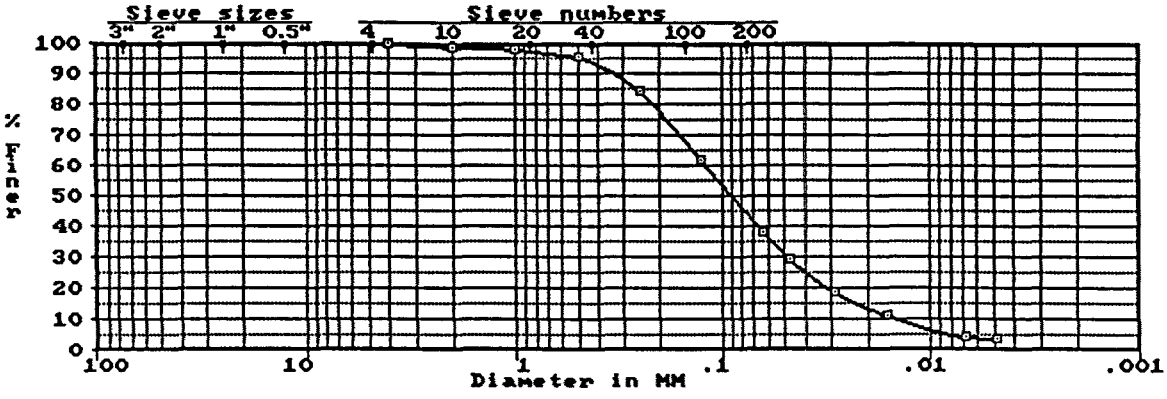
SM Silty SAND

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 13.6 Frost Classification: F2

Comments

-Date sampled: 7-22-97
-Specific gravity: 2.611
-Roundness grading: subrounded
-Volatile solids: 4.2%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-24Z Depth: Lab No.: 213WR24Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	116.58	86.3
5/8 In.	160.05	81.1
5/16 In.	191.52	77.4
No. 5	231.28	72.7
No. 10	354.52	58.2
Pan	848.70	0.0
No. 18	34.50	34.7
No. 35	54.41	21.1
No. 60	71.46	9.5
No. 120	78.58	4.7
No. 230	81.50	2.7
Pan	85.44	0.0

No hydrometer analysis.

$\bar{x} = 10.01$

D85: 28.1 D60: 2.14 D50: 1.57 D30: 0.81 D15: 0.36 D10: 0.26 mm

Cu: 8.24 Cc: 1.19

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 25.6% Sand: 71.4% Fines: 3.0%

---------- ASTM D 2487 Classification ----------

SW Well-graded SAND with gravel

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: **NFS**

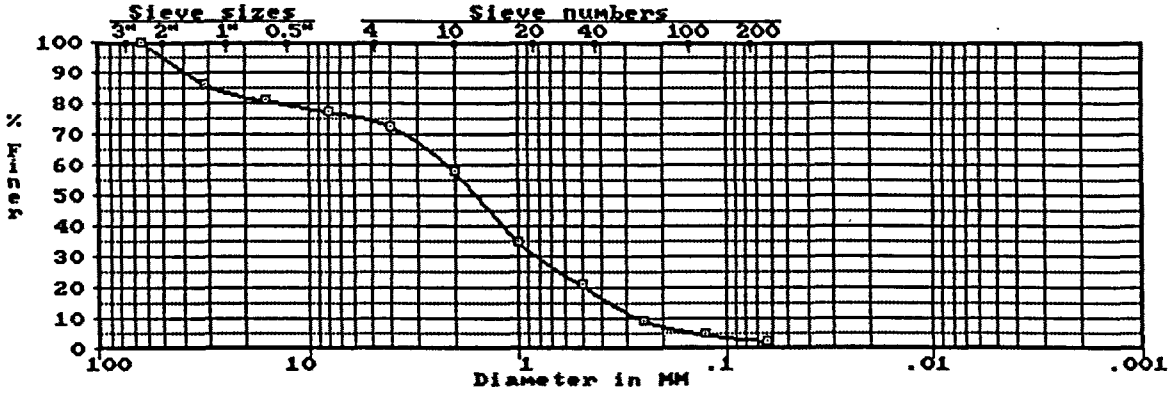
---------- Comments ----------

-Date sampled: 7-22-97

-Specific gravity: 2.756

-Roundness grading: subangular to subrounded

-Volatile solids: 0.9%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-25Z Depth: Lab No.: 213WR25Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.95	99.9
Pan	977.16	0.0
No. 18	0.38	99.5
No. 35	10.21	89.2
No. 60	82.00	13.7
No. 120	89.85	5.4
No. 230	91.73	3.4
Pan	94.98	0.0

No hydrometer analysis.

$\bar{x} = .36$

D85: 0.48 D60: 0.38 D50: 0.35 D30: 0.29 D15: 0.25 D10: 0.18 mm

Cu: 2.09 Cc: 1.20

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 96.1% Fines: 3.9%

---------- ASTM D 2487 Classification ----------

SP Poorly graded SAND

---------- Comments ----------

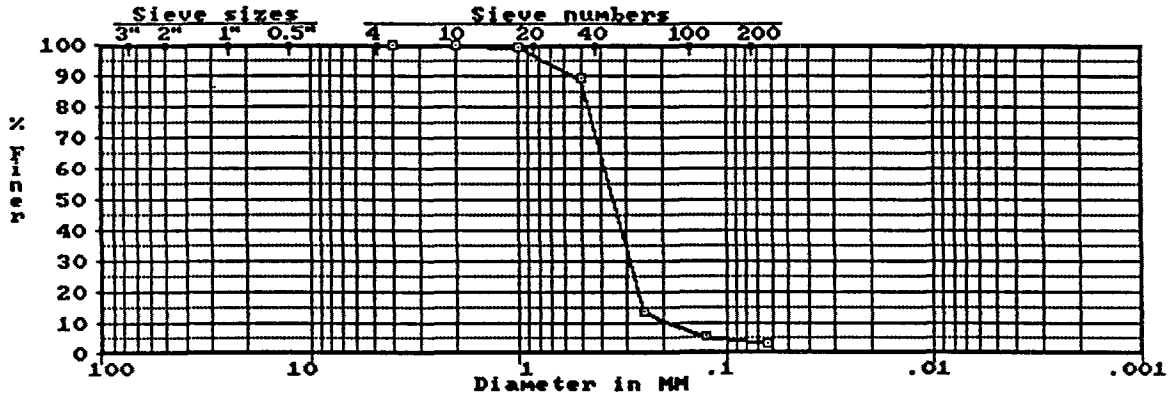
-Date sampled: 7-24-97

-Specific gravity: 2.657

-Roundness grading: subangular to subrounded

-Volatile solids: 1.5%

Percent finer than 0.02 mm unknown, therefore no frost classification.



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-30Z Depth: Lab No.: 213WR30Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	526.60	0.0
No. 18	0.06	99.9
No. 35	1.32	98.2
No. 60	4.19	94.2
No. 120	21.51	70.3
No. 230	36.38	49.8
Pan	72.50	0.0

$\bar{X}$=.089

---------- Hydrometer Analysis ----------

Sample Weight:72.50 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	29.0	0.0455	40.3
3	20.0	19.0	0.0281	26.6
10	20.0	11.0	0.0161	15.7
100	20.0	5.5	0.0068	8.2
200	20.0	5.0	0.0048	7.5

D85: 0.19 D60: .089 D50: .063 D30: .032 D15: .015 D10: .0096 mm

Cu: 9.32 Cc: 1.19

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 45.2% Fines: 54.8%

---------- ASTM D 2487 Classification ----------

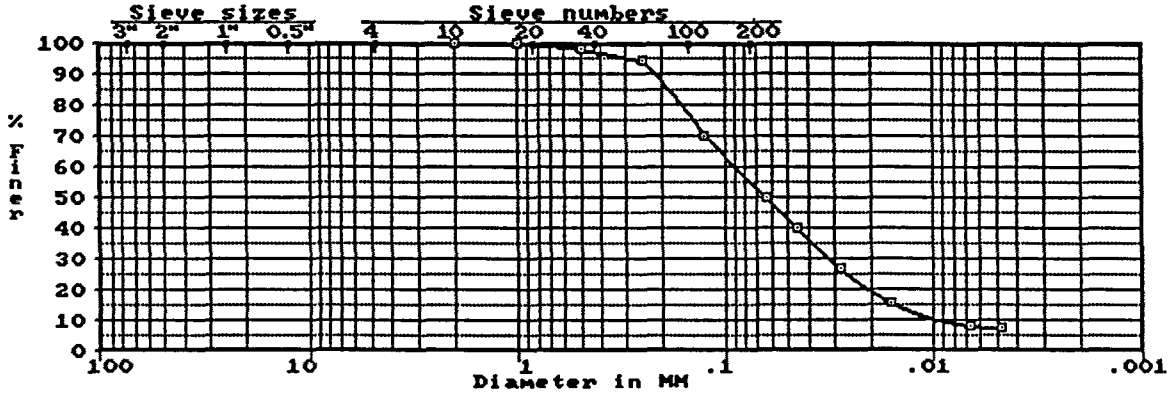
ML Sandy SILT

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 19.3 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-22-97
-Specific gravity: 2.538
-Roundness grading: subrounded
-Volatile solids: 5.8%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-31Z Depth: Lab No.: 213WR31Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	566.80	0.0
No. 18	0.13	99.8
No. 35	0.96	98.6
No. 60	2.80	96.0
No. 120	9.83	85.9
No. 230	28.37	59.3
Pan	69.73	0.0

$\bar{X} = .061$

---------- Hydrometer Analysis ----------

Sample Weight: 69.73 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	32.0	0.0446	46.1
3	20.0	22.0	0.0276	31.9
10	20.0	13.0	0.0159	19.2
100	20.0	6.0	0.0068	9.2
200	20.0	5.0	0.0048	7.8

D85: 0.12 D60: .064 D50: .050 D30: .026 D15: .012 D10: .0077 mm

Cu: 8.34 Cc: 1.34

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 33.2% Fines: 66.8%

---------- ASTM D 2487 Classification ----------

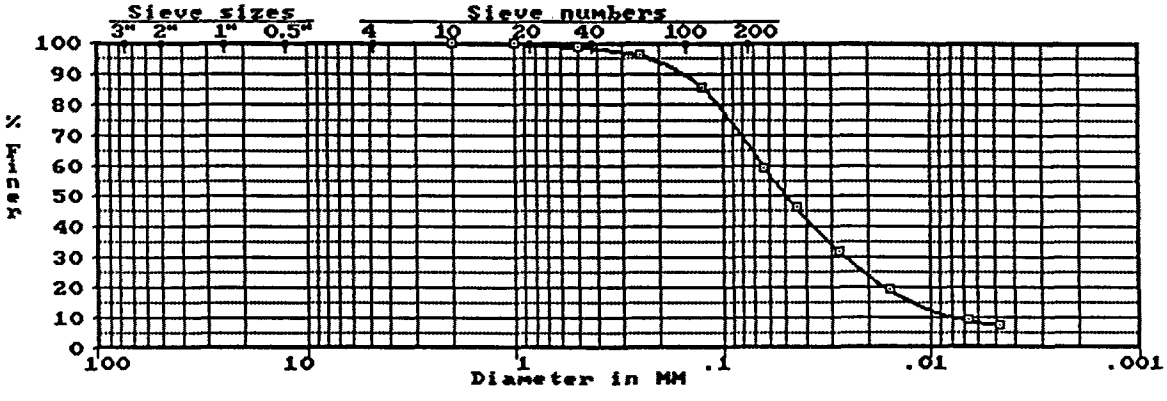
ML Sandy SILT

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 23.9 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-22-97
-Specific gravity: 2.541
-Roundness grading: subrounded
-Volatile solids: 5.3%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-32Z Depth: Lab No.: 213WR32Z

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	777.70	0.0
No. 18	0.07	99.9
No. 35	0.27	99.6
No. 60	1.19	98.2
No. 120	2.33	96.5
No. 230	6.30	90.6
Pan	67.05	0.0

$\bar{X} = .031$

Hydrometer Analysis

Sample Weight: 67.05 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	47.7	0.0390	71.2
3	20.0	34.2	0.0253	51.2
10	20.0	22.2	0.0151	33.5
100	20.0	10.2	0.0066	15.8
200	20.0	7.2	0.0048	11.4

D85: .054 D60: .031 D50: .025 D30: .013 D15: .0063 mm

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 7.9% Fines: 92.1%

ASTM D 2487 Classification

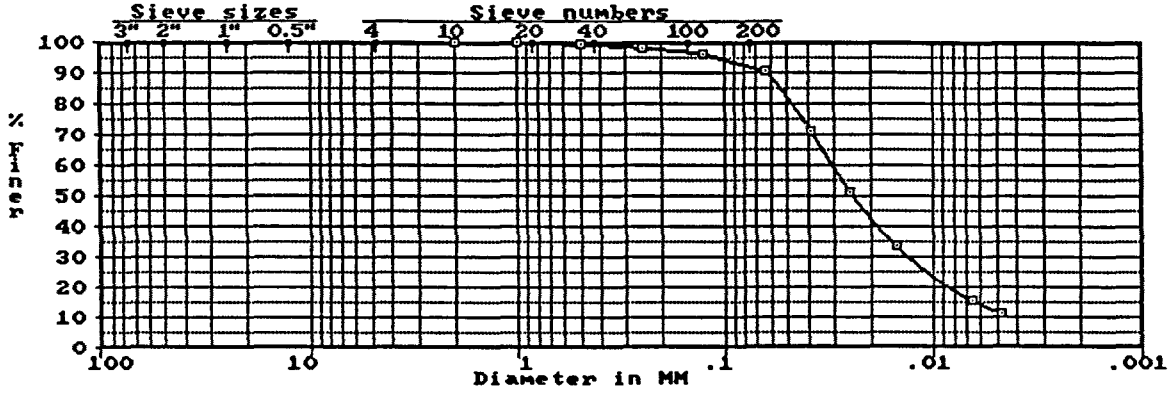
ML SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 42.4 Frost Classification: F4

Comments

-Date sampled: 7-24-97
-Specific gravity: 2.596
-Roundness grading: subrounded
-Volatile solids: 3.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-33Z Depth: Lab No.: 213WR33Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	554.30	0.0
No. 18	0.00	100.0
No. 35	0.09	99.9
No. 60	0.37	99.4
No. 120	1.03	98.5
No. 230	9.39	85.9
Pan	66.48	0.0

---------- Hydrometer Analysis ----------

Sample Weight:66.48 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	40.2	0.0418	60.6
3	20.0	23.7	0.0273	36.0
10	20.0	13.2	0.0159	20.4
100	20.0	6.7	0.0067	10.7
200	20.0	3.2	0.0049	5.5

$\bar{x}$ = .036

D85: .062 D60: .041 D50: .035 D30: .023 D15: .011 D10: .0064 mm

Cu: 6.43 Cc: 2.02

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 8.6% Fines: 91.4%

---------- ASTM D 2487 Classification ----------

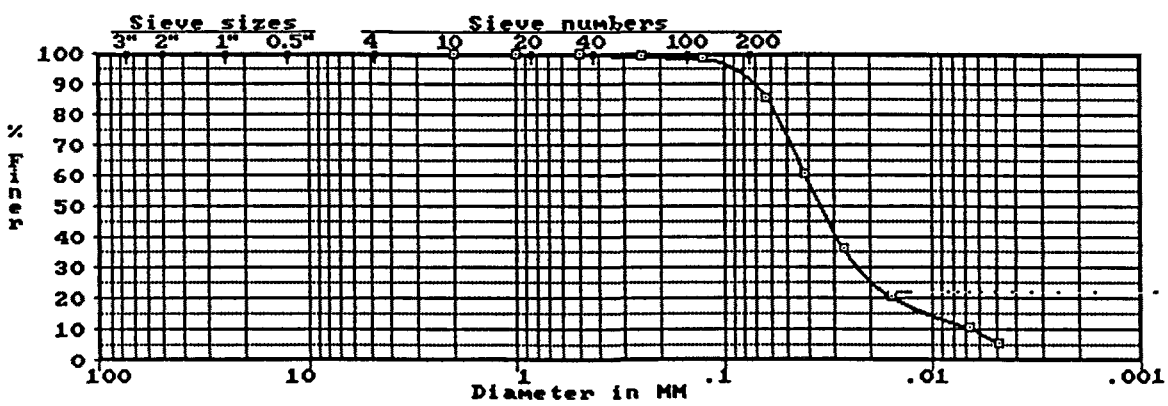
ML SILT

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 25.5 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-22-97
-Specific gravity: 2.619
-Roundness grading: subrounded
-Volatile solids: 3.5%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-35A Depth: Lab No.: 213WR35A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.79	99.9
Pan	577.10	0.0
No. 18	0.11	99.7
No. 35	1.36	98.0
No. 60	10.75	85.1
No. 120	21.49	70.3
No. 230	29.49	59.3
Pan	72.59	0.0

$\bar{X} = .105$

Hydrometer Analysis

Sample Weight: 72.59 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	28.2	0.0458	39.1
3	20.0	20.7	0.0278	28.9
10	20.0	13.7	0.0159	19.3
100	20.0	7.2	0.0067	10.5
200	20.0	5.2	0.0048	7.8

D85: 0.25 D60: .064 D50: .054 D30: .031 D15: .011 D10: .0063 mm

Cu: 10.2 Cc: 2.37

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 36.0% Fines: 64.0%

ASTM D 2487 Classification

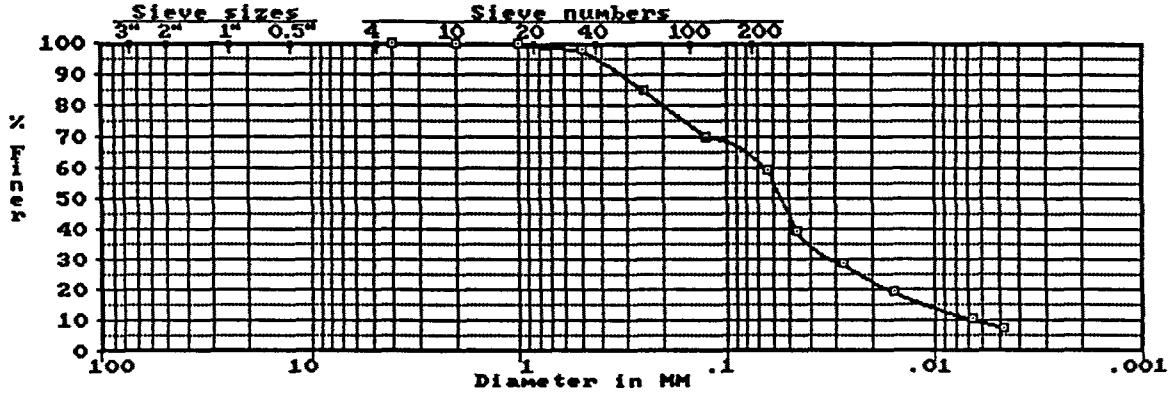
ML Sandy SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 23.0 Frost Classification: F4

Comments

-Date sampled: 7-23-97
-Specific gravity: 2.556
-Roundness grading: subrounded
-Volatile solids: 6.9%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-37A Depth: Lab No.: 213WR37A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	10.76	98.9
No. 5	24.44	97.6
No. 10	48.69	95.1
Pan	1002.86	0.0
No. 18	6.04	88.5
No. 35	44.50	46.1
No. 60	83.50	3.1
No. 120	86.07	0.3
No. 230	86.23	0.1
Pan	86.34	0.0

No hydrometer analysis.

$\bar{x} = .59$

D85: 0.93 D60: 0.61 D50: 0.53 D30: 0.40 D15: 0.31 D10: 0.29 mm

Cu: 2.12 Cc: 0.91

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 2.0% Sand: 97.8% Fines: 0.2%

---------- ASTM D 2487 Classification ----------

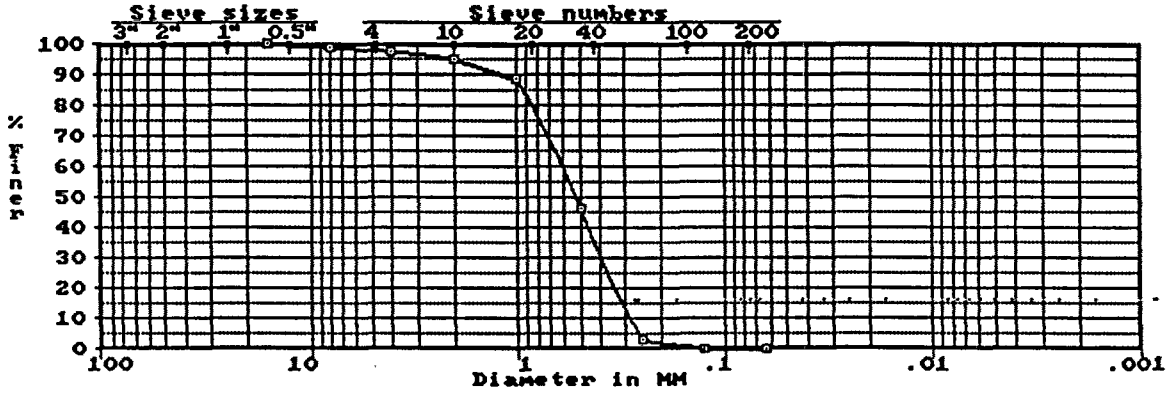
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.681
-Roundness grading: subangular to subrounded
-Volatile solids: 0.9%



* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-38Z Depth: Lab No.: 213WR38Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	6.38	99.2
No. 5	37.61	95.5
No. 10	91.39	89.0
Pan	831.84	0.0
No. 18	7.14	81.8
No. 35	48.11	40.3
No. 60	85.19	2.8
No. 120	87.65	0.3
No. 230	87.81	0.1
Pan	87.94	0.0

No hydrometer analysis.

$\bar{x} = .757$

D85: 1.36 D60: 0.67 D50: 0.58 D30: 0.43 D15: 0.33 D10: 0.30 mm

Cu: 2.28 Cc: 0.92

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 3.3% Sand: 96.5% Fines: 0.2%

---------- ASTM D 2487 Classification ----------

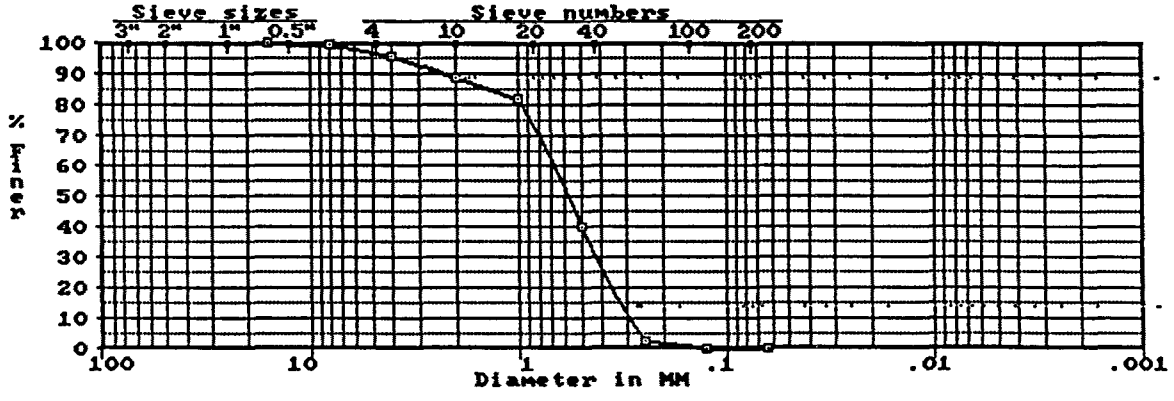
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.673
-Roundness grading: subangular to subrounded
-Volatile solids: 0.9%



* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-39Z Depth: Lab No.: 213WR39Z

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	5.12	99.4
Pan	805.60	0.0
No. 18	3.72	95.0
No. 35	52.16	37.6
No. 60	82.34	1.9
No. 120	83.63	0.3
No. 230	83.72	0.2
Pan	83.92	0.0

No hydrometer analysis.

$\bar{X} = .593$

D85: 0.87 D60: 0.64 D50: 0.57 D30: 0.45 D15: 0.34 D10: 0.31 mm

Cu: 2.07 Cc: 1.01

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 99.8% Fines: 0.2%

---------- ASTM D 2487 Classification ----------

SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: NFS

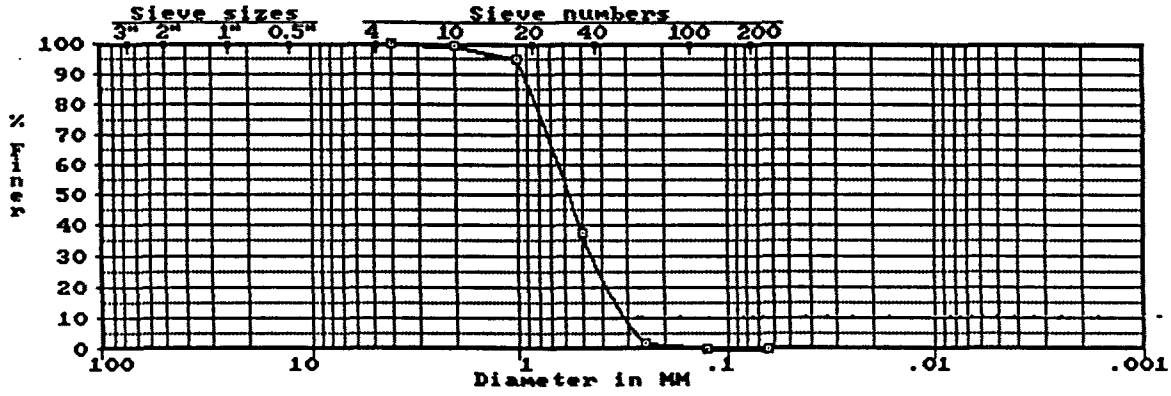
---------- Comments ----------

-Date sampled: 7-23-97

-Specific gravity: 2.676

-Roundness grading: subangular to subrounded

-Volatile solids: 0.8%



* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-18A Depth: Lab No.: 213WR18A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	544.20	0.0
No. 18	0.00	100.0
No. 35	0.23	99.7
No. 60	2.85	95.9
No. 120	7.56	89.1
No. 230	18.42	73.4
Pan	69.21	0.0

Hydrometer Analysis

Sample Weight: 69.21 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	37.2	0.0428	53.9
3	20.0	27.2	0.0266	39.6
10	20.0	16.7	0.0156	24.6
100	20.0	6.2	0.0068	9.6
200	20.0	4.2	0.0048	6.7

D85: .096 D60: .048 D50: .038 D30: .019 D15: .0098 D10: .0070 mm

Cu: 6.90 Cc: 1.08

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 21.0% Fines: 79.0%

ASTM D 2487 Classification

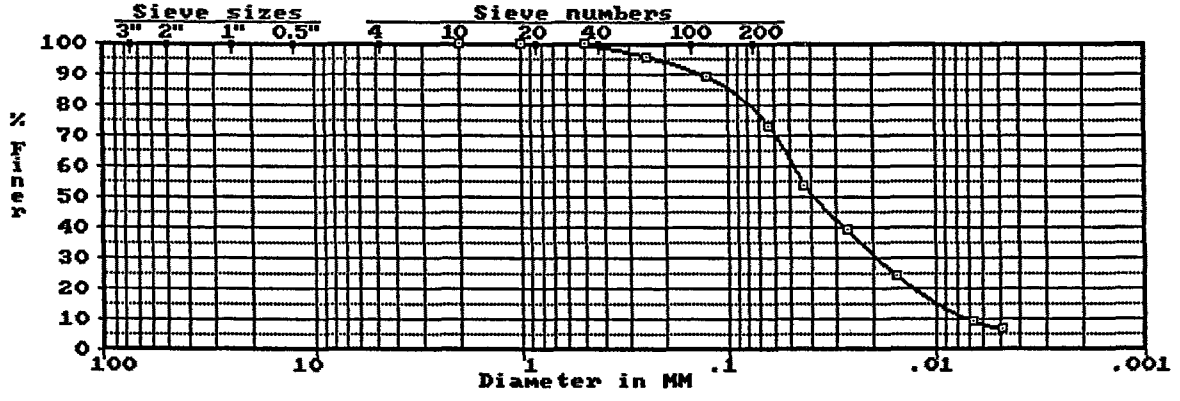
ML SILT with sand

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 31.2 Frost Classification: F4

Comments

-Date sampled: 7-22-97
-Specific gravity: 2.503
-Roundness grading: subrounded
-Volatile solids: 7.0%



036 A

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-19A Depth: Lab No.: 213WR19A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	1.10	99.9
Pan	989.60	0.0
No. 18	0.33	99.5
No. 35	10.32	87.8
No. 60	72.15	15.6
No. 120	84.80	0.9
No. 230	85.19	0.4
Pan	85.54	0.0

No hydrometer analysis.

D85: 0.49 D60: 0.38 D50: 0.35 D30: 0.29 D15: 0.24 D10: 0.19 mm

Cu: 1.99 Cc: 1.12

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 99.5% Fines: 0.5%

---------- ASTM D 2487 Classification ----------

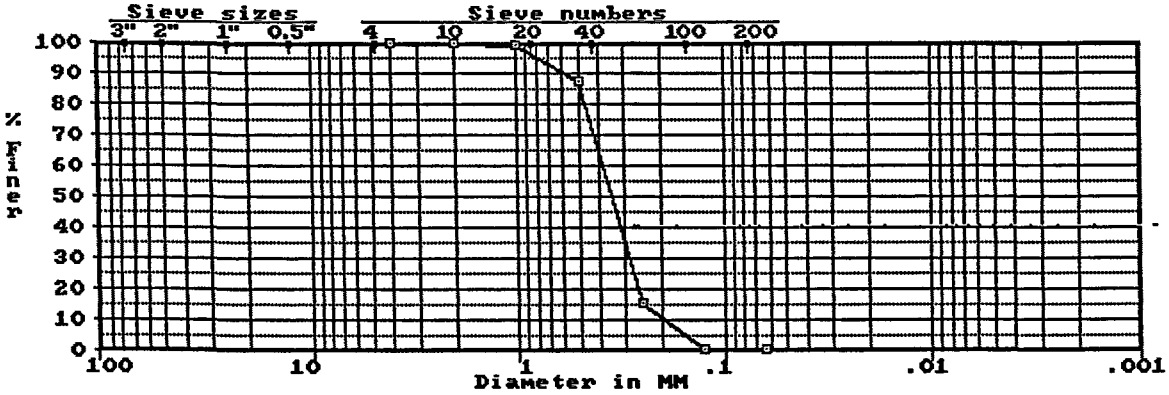
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: **NFS**

---------- Comments ----------

-Date sampled: 7-22-97
-Specific gravity: 2.677
-Roundness grading: subangular to subrounded
-Volatile solids: 1.2%



036 B

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-20 Depth: Lab No.: 213WR20

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	14.84	99.1
No. 10	24.77	98.5
Pan	1638.50	0.0
No. 18	1.58	96.8
No. 35	31.60	65.0
No. 60	82.76	10.8
No. 120	85.48	7.9
No. 230	87.37	5.9
Pan	92.94	0.0

No hydrometer analysis.

D85: 0.72 D60: 0.47 D50: 0.42 D30: 0.33 D15: 0.27 D10: 0.21 mm

Cu: 2.29 Cc: 1.09

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.7% Sand: 93.0% Fines: 6.3%

---------- ASTM D 2487 Classification ----------

SP-SM Poorly graded SAND with silt

---------- Comments ----------

-Date sampled: 7-24-97

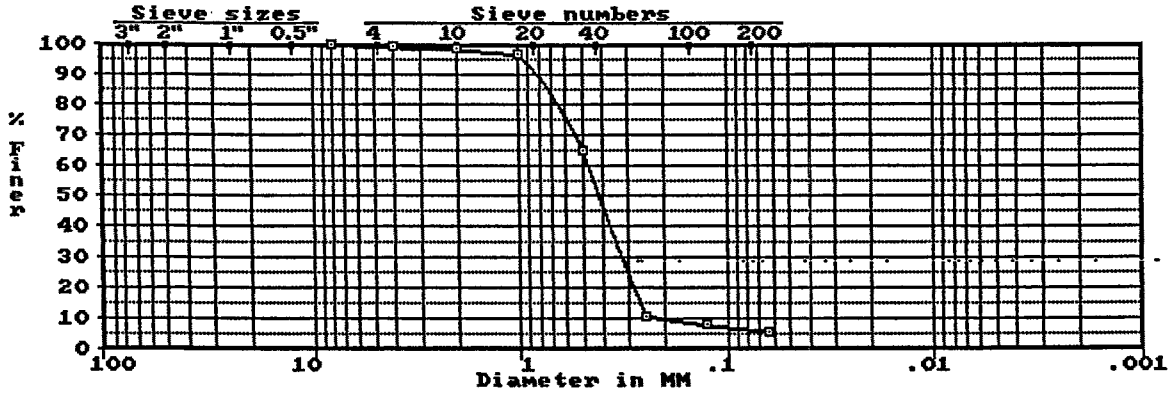
-Time: 09:02

-Specific gravity: 2.605

-Roundness grading: subangular to sub rounded

-Volatile solids: 2.2%

Percent finer than 0.02 mm unknown, therefore no frost classification.



036 C

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-22 Depth: Lab No.: 213WR22

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	35.31	98.4
No. 5	124.23	94.5
No. 10	196.07	91.3
Pan	2258.80	0.0
No. 18	7.33	85.4
No. 35	50.56	50.7
No. 60	108.06	4.4
No. 120	112.45	0.9
No. 230	112.96	0.5
Pan	113.55	0.0

No hydrometer analysis.

D85: 0.99 D60: 0.58 D50: 0.50 D30: 0.38 D15: 0.30 D10: 0.28 mm

Cu: 2.11 Cc: 0.89

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 4.5% Sand: 94.9% Fines: 0.6%

---------- ASTM D 2487 Classification ----------

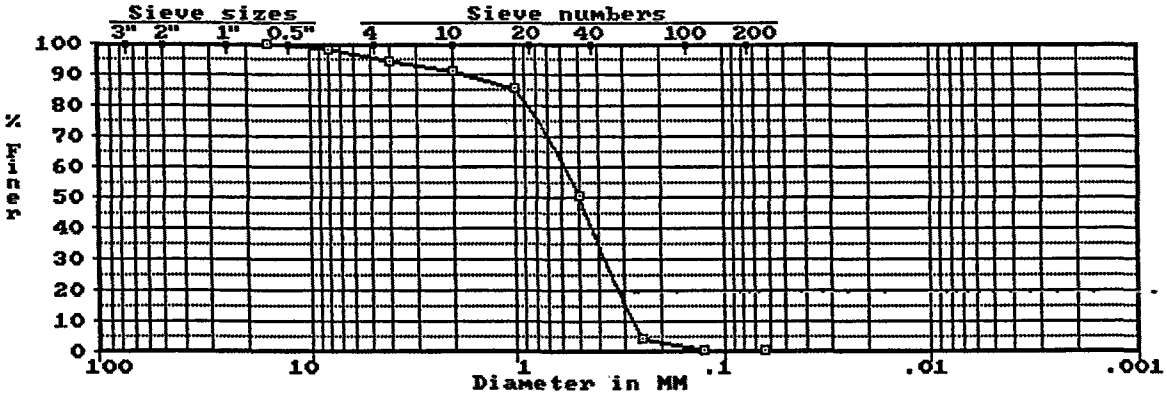
SP Poorly graded SAND

---------- TM 5-818-2 Frost Classification ----------

Frost Classification: **NFS**

---------- Comments ----------

-Date sampled: 7-25-97
-Time: 13:28
-Specific gravity: 2.669
-Roundness grading: subangular-subrounded
-Volatile solids: 2.3%



036 D

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-25A Depth: Lab No.: 213WR25A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	462.50	0.0
No. 18	0.00	100.0
No. 35	0.84	98.7
No. 60	3.32	94.7
No. 120	4.44	92.9
No. 230	9.20	85.3
Pan	62.46	0.0

Hydrometer Analysis

Sample Weight: 62.46 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	41.0	0.0415	65.8
3	20.0	28.0	0.0265	45.2
10	20.0	16.5	0.0156	26.9
100	20.0	5.0	0.0068	8.7
200	20.0	4.5	0.0048	7.9

D85: .063 D60: .037 D50: .030 D30: .017 D15: .010 D10: .0076 mm

Cu: 4.86 Cc: 1.08

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 12.8% Fines: 87.2%

ASTM D 2487 Classification

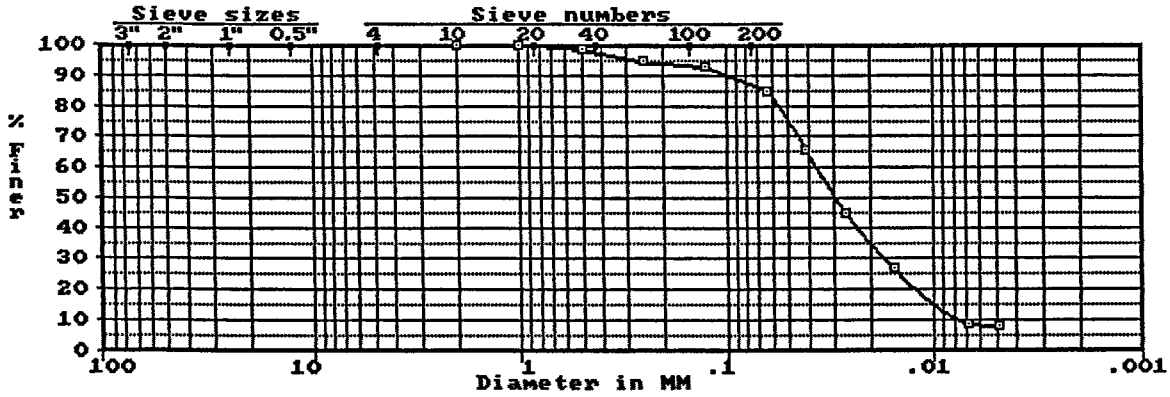
ML SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 34.7 Frost Classification: F4

Comments

-Date sampled: 7-24-97
-Specific gravity: 2.527
-Roundness grading: subrounded
-Volatile solids: 6.3%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-32A Depth: Lab No.: 213WR32A

Sieve Analysis

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	663.80	0.0
No. 18	0.27	99.6
No. 35	1.79	97.4
No. 60	4.52	93.4
No. 120	15.93	76.8
No. 230	32.53	52.7
Pan	68.77	0.0

Hydrometer Analysis

Sample Weight: 68.77 gr. Start Time: 0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	33.0	0.0442	48.2
3	20.0	23.0	0.0274	33.8
10	20.0	13.5	0.0159	20.2
100	20.0	5.0	0.0068	7.9
200	20.0	4.5	0.0048	7.2

D85: 0.17 D60: .079 D50: .051 D30: .024 D15: .012 D10: .0086 mm

Cu: 9.19 Cc: 0.84

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 41.8% Fines: 58.2%

ASTM D 2487 Classification

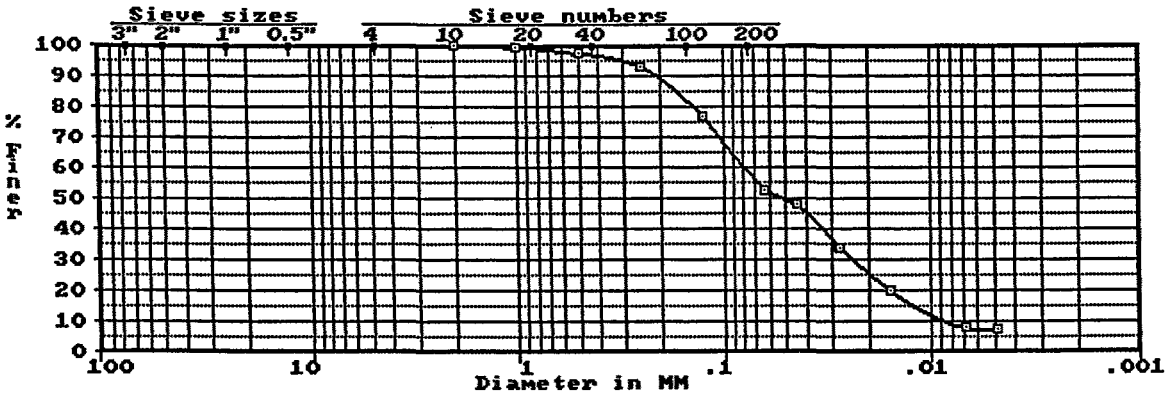
ML Sandy SILT

TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 25.5 Frost Classification: F4

Comments

-Date sampled: 7-22-97
-Specific gravity: 2.571
-Roundness grading: subrounded
-Volatile solids: 5.1%



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WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: **WR-GC-33A** Depth: Lab No.: 213WR33A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	3.11	99.8
No. 10	3.11	99.8
Pan	1299.50	0.0
No. 18	0.00	99.8
No. 35	0.61	98.9
No. 60	3.73	94.3
No. 120	15.06	77.6
No. 230	30.62	54.7
Pan	67.82	0.0

---------- Hydrometer Analysis ----------

Sample Weight: 67.82 gr. Start Time:

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	29.6	0.0453	43.8
3	20.0	19.1	0.0281	28.5
10	20.0	10.6	0.0162	16.2
100	20.0	4.1	0.0068	6.7
200	20.0	2.6	0.0049	4.5

D85: 0.16 D60: .073 D50: .055 D30: .030 D15: .015 D10: .010 mm

Cu: 7.20 Cc: 1.17

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.2% Sand: 39.0% Fines: 60.8%

---------- ASTM D 2487 Classification ----------

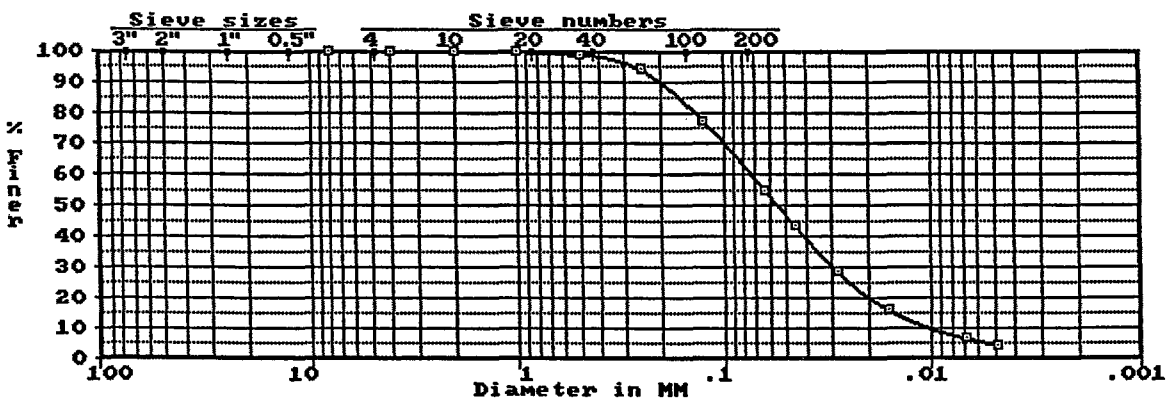
ML Sandy SILT

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 20.3 Frost Classification: **F4**

---------- Comments ----------

-Date sampled: 7-22-97
-Specific gravity: 2.549
-Roundness grading: subrounded
-Volatile solids: 5.0%



* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-GC-34A Depth: Lab No.: 213WR34A

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	12.38	97.5
Pan	495.78	0.0
No. 18	1.09	96.0
No. 35	7.90	86.9
No. 60	24.57	64.4
No. 120	37.95	46.4
No. 230	48.74	31.8
Pan	72.34	0.0

---------- Hydrometer Analysis ----------

Sample Weight:72.340 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	19.1	0.0486	26.2
3	20.0	13.6	0.0290	18.8
10	20.0	10.6	0.0162	14.8
100	20.0	3.1	0.0069	4.8
200	20.0	2.6	0.0049	4.1

D85: 0.47 D60: 0.21 D50: 0.15 D30: .058 D15: .017 D10: .011 mm

Cu: 19.2 Cc: 1.42

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 64.6% Fines: 35.4%

---------- ASTM D 2487 Classification ----------

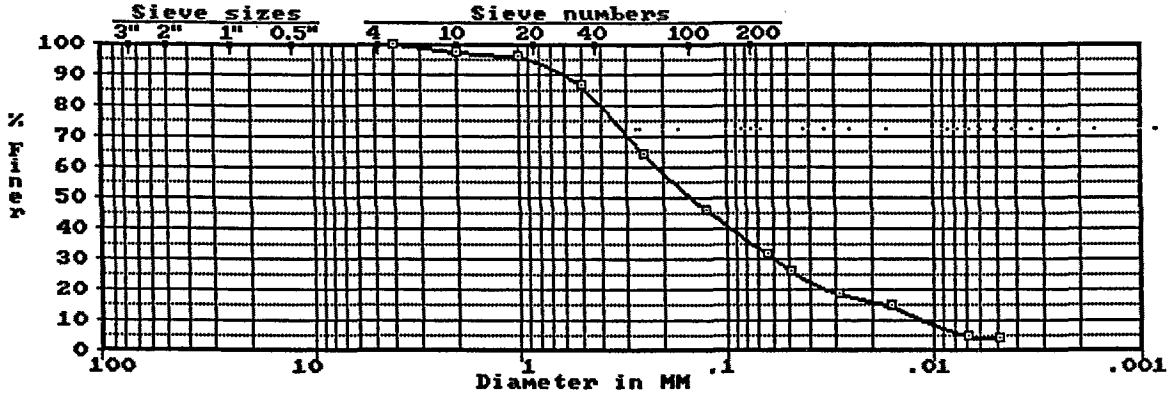
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 16.1 Frost Classification: F4

---------- Comments ----------

-Date sampled: 7-23-97
-Specific gravity: 2.590
-Roundness grading: subangular to subrounded
-Volatile solids: 4.7%
-Sample is not on Chain of Custody Record



036 H

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *

WILLAMETTE RIVER CHANNEL DEEPENING 97-0213

Boring: Sample: WR-BC-36 Depth: Lab No.: 213WR36

------ Sieve Analysis ------

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	6.25	99.7
No. 10	9.41	99.5
Pan	1880.50	0.0
No. 18	0.17	99.3
No. 35	5.65	92.2
No. 60	31.02	59.4
No. 120	47.46	38.1
No. 230	55.37	27.9
Pan	76.93	0.0

---------- Hydrometer Analysis ----------

Sample Weight:76.93 gr. Start Time:0000

Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
1	20.0	17.6	0.0491	23.2
3	20.0	12.6	0.0292	16.8
10	20.0	8.2	0.0164	11.1
100	20.0	3.6	0.0069	5.2
200	20.0	2.6	0.0049	4.0

D85: 0.42 D60: 0.25 D50: 0.19 D30: .074 D15: .025 D10: .014 mm

Cu: 17.5 Cc: 1.50

Liquid Limit: NP Plasticity Index: NP

Fines Type Used for Classification: ML, SILT

Gravel: 0.2% Sand: 69.6% Fines: 30.2%

---------- ASTM D 2487 Classification ----------

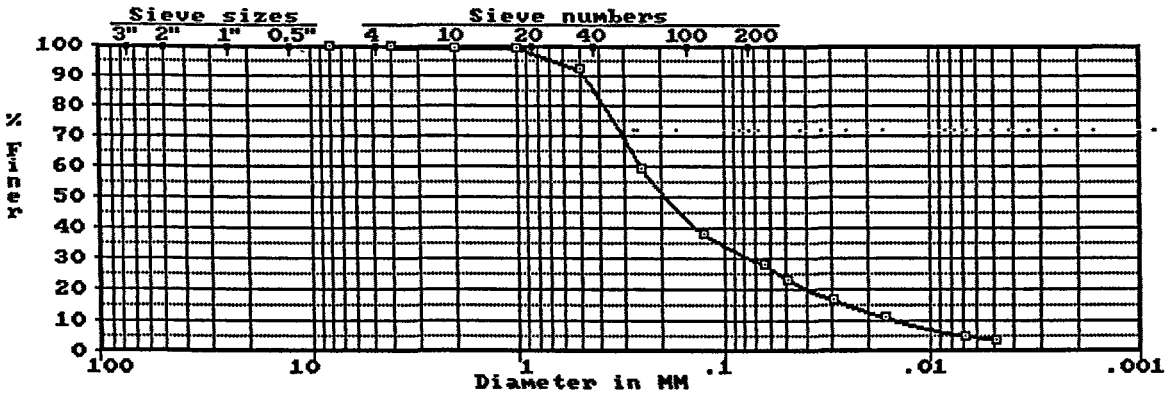
SM Silty SAND

---------- TM 5-818-2 Frost Classification ----------

Percent finer than 0.02 mm: 12.9 Frost Classification: F2

---------- Comments ----------

-Date sampled: 7-25-97
-Time: 09:45
-Specific gravity: 2.603
-Roundness grading: subangular-subrounded
-Volatile solids: 3.8%



HEADER SHEET FOR SEDIMENT SAMPLING TRIP

PROJECT LOCATION: CRCD - Willamette River

SAMPLING DATE: 7/23/97

SAMPLING METHOD (PONAR/BOX CORE/GRAVITY CORE/VIBRA CORE):

SAMPLING ANALYSIS (SAMPLE NUMBERS ANALYZED)

GRAIN SIZE:

OIL/GREASE:

AMMONIA (NH4):

SULFIDE: WR-GC-39A, WR-D, WR-CD - 34A, 35A, 37A, 38A, 40A, 41A, 41B 42A, 42B, 43A, 43B

TOTAL ORGANIC CARBON (TOC): "

VOLATILE SOLIDS: SAME AS GRAIN SIZE

METALS: SAME AS SULFIDE

PESTICIDES: "

PAH'S: "

ELUTRIATES:

BIOLOGICAL:

SEDIMENT QUALITY dBASE FILES:

Columbia
Analytical
Services inc.

September 4, 1997

Service Request No: K9705215

Mark Siipola
U.S. Army Corps of Engineers
333 SW First Avenue, Robert Duncan Plaza
Portland, OR 97204

Re: Channel Deepening/5672

Dear Mark:

Enclosed are the results of the sample(s) submitted to our laboratory on July 24, 1997. For your reference, these analyses have been assigned our service request number K9705215.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Elizabeth Schneider
Project Chemist

ES/ee

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
J	Estimated concentration. The value is less than the method reporting limit, but greater than the method detection limit.
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Hart Crowser, Inc.	**Service Request No.:**	K9705215
Project:	Channel Deepening/5672	**Date Received:**	7/24/97
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier IIA data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

The Relative Percent Difference (RPD) for the replicate analysis of Mercury was outside the normal CAS control limits. The variability in the results is attributed to the heterogeneous character of the sample. Mixing techniques within the scope of the EPA methodology were used, but were not sufficient for complete homogenization of this sample.

The SIM PAH LCS associated with the 7/31/97 extraction batch yielded slightly low Acenaphthene recovery. Since the Acenaphthene recoveries in the MS/DMS were acceptable, no further corrective action was taken.

Approved by_____ Date 7/31/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97

Total Solids (%)

Prep Method: NONE
Analysis Method: 160.3 M
Test Notes:

Units: Percent
Basis: NA

Sample Name	Lab Code	Date Analyzed	Result	Result Notes
WR-GC-39A	K9705215-001	7/29/97	78.1	
WR-CD-42A	K9705215-003	7/29/97	59.5	
WR-CD-42B	K9705215-004	7/29/97	92.8	
WR-CD-42C	K9705215-005	7/29/97	62.6	
WR-CD-42D	K9705215-006	7/29/97	63.8	
WR-D	K9705215-007	7/29/97	89.2	
WR-CD-43A	K9705215-008	7/29/97	86.5	
WR-CD-43B	K9705215-009	7/29/97	89.7	
WR-CD-41A	K9705215-011	7/29/97	73.2	
-CD-41B	K9705215-012	7/29/97	60.2	
-CD-40A	K9705215-014	7/29/97	82.0	
WR-GC-38A	K9705215-016	7/29/97	71.2	
WR-GC-37A	K9705215-018	7/29/97	81.3	
WR-GC-35A	K9705215-019	7/29/97	55.8	
WR-GC-34A	K9705215-021	7/29/97	61.9	

Approved By: JC Date: 7/30/97

Total Solids/042095

05215ICP.JC1 - Total Solids 7/30/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-39A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	2.3	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.09	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	17.3	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	15.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	5.65	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.04	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	12.7	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.07	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	190	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-42A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.27	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	35.4	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	30.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	26.9	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	23.5	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.41	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	102	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-42B	Units:	mg/Kg (ppm)
Lab Code:	K9705215-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.19	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	19.0	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	20.9	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	19.9	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	14.2	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.25	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	131	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-42C	Units:	mg/Kg (ppm)
Lab Code:	K9705215-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	0.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.30	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	29.2	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	30.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	26.6	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.87	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	19.6	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.41	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	179	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-42D	Units:	mg/Kg (ppm)
Lab Code:	K9705215-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.31	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	32.3	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	30.8	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	26.0	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.34	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	21.3	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.35	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	160	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-D	Units:	mg/Kg (ppm)
Lab Code:	K9705215-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.11	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	19.6	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	18.0	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	64.3	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	14.3	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	55.6	

Approved By: _____ Date: 9/4/97

1S44mc/031695

05215ICP.GJ1 - Sample (6) 9/4/97

047

97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-43A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	19.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	2.12	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	17.2	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	70.1	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	489	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	13.8	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.12	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	102	

Approved By: _____ Date: 9/4/97

00013

1S44mc/031695

05215ICP.GJ1 - Sample (7) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-43B	Units:	mg/Kg (ppm)
Lab Code:	K9705215-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.07	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	14.4	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	14.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	15.0	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.10	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	11.9	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.05	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	45.9	

Approved By: _____ Date: 1/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-41A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.11	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	22.2	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	17.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	26.1	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	17.1	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.12	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	80.6	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-41B	Units:	mg/Kg (ppm)
Lab Code:	K9705215-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.06	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	32.7	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	36.4	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	18.5	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.09	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	21.0	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.34	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	103	

Approved By: _____ Date: 9/4/97

00016

1S44mc/031695

05215ICP.GJ1 - Sample (10) 9/4/97

051

Page No :

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-CD-40A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-014	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	0.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.04	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	15.1	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	11.9	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	2.15	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.01	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	11.0	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.03	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	29.4	

Approved By: _____ Date: 9/4/97

00017

1S44mc/031695

05215ICP.GJ1 - Sample (11) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-38A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-016	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.17	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	22.8	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	21.3	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	9.08	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.10	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	14.5	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.14	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	74.5	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-37A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-018	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.05	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	13.9	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	11.0	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	3.51	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.01	J
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	10.4	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.03	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	37.5	

Approved By: _____ Date: 9/4/97

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05215ICP.GJ1 - Sample (13) 9/4/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-35A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-019	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.33	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	34.5	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	35.9	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	25.7	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.18	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	21.2	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.38	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	181	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-34A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-021	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	2.0	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	0.23	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	29.4	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	35.9	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	17.7	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.19	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	19.8	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	0.29	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	108	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Total Metals

Sample Name:	Method Blank	Units:	mg/Kg (ppm)
Lab Code:	K9705215-MB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	ND	
Chromium	3050A	200.8	0.5	0.2	10	7/29/97	7/31/97	ND	
Copper	3050A	200.8	0.1	0.08	10	7/29/97	7/31/97	ND	
Lead	3050A	200.8	0.02	0.02	10	7/29/97	7/31/97	ND	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	ND	
Nickel	3050A	200.8	0.5	0.08	10	7/29/97	7/31/97	ND	
Silver	3050A	200.8	0.02	0.008	10	7/29/97	7/31/97	ND	
Zinc	3050A	200.8	0.5	0.4	10	7/29/97	7/31/97	ND	

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97

Carbon, Total Organic

Prep Method: NONE
Analysis Method: ASTM D4129-82M
Test Notes:

Units: PERCENT
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-GC-39A	K9705215-001	0.05	0.05	1	NA	8/4/97	0.77	
WR-CD-42A	K9705215-003	0.05	0.05	1	NA	8/4/97	1.51	
WR-CD-42B	K9705215-004	0.05	0.05	1	NA	8/4/97	1.44	
WR-CD-42C	K9705215-005	0.05	0.05	1	NA	8/4/97	1.98	
WR-CD-42D	K9705215-006	0.05	0.05	1	NA	8/4/97	2.09	
WR-D	K9705215-007	0.05	0.05	1	NA	8/4/97	1.21	
WR-CD-43A	K9705215-008	0.05	0.05	1	NA	8/4/97	0.38	
WR-CD-43B	K9705215-009	0.05	0.05	1	NA	8/4/97	0.10	
WR-CD-41A	K9705215-011	0.05	0.05	1	NA	8/4/97	0.44	
WR-CD-41B	K9705215-012	0.05	0.05	1	NA	8/5/97	2.74	
R-CD-40A	K9705215-014	0.05	0.05	1	NA	8/5/97	0.30	
R-GC-38A	K9705215-016	0.05	0.05	1	NA	8/5/97	1.04	
WR-GC-37A	K9705215-018	0.05	0.05	1	NA	8/5/97	0.07	
WR-GC-35A	K9705215-019	0.05	0.05	1	NA	8/5/97	2.33	
WR-GC-34A	K9705215-021	0.05	0.05	1	NA	8/5/97	1.96	
Method Blank 1	K9705215-MB1	0.05	0.05	1	NA	8/4/97	ND	
Method Blank 2	K9705215-MB2	0.05	0.05	1	NA	8/5/97	ND	

M Modified

Approved By: _____ Date: 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97

Sulfide, Acid-Volatile

Prep Method: NONE
Analysis Method: Draft Aug 91
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-GC-39A	K9705215-001	0.7	0.4	1	NA	8/5/97	0.8	
WR-CD-42A	K9705215-003	0.7	0.4	1	NA	8/5/97	11.9	
WR-CD-42B	K9705215-004	0.7	0.4	1	NA	8/5/97	26	
WR-CD-42C	K9705215-005	0.7	0.4	1	NA	8/5/97	42	
WR-CD-42D	K9705215-006	0.7	0.4	1	NA	8/5/97	24	
WR-D	K9705215-007	0.7	0.4	1	NA	8/5/97	42	
WR-CD-43A	K9705215-008	0.7	0.4	1	NA	8/5/97	2.9	
WR-CD-43B	K9705215-009	0.7	0.4	1	NA	8/5/97	0.9	
WR-CD-41A	K9705215-011	0.7	0.4	1	NA	8/5/97	2.9	
WR-CD-41B	K9705215-012	0.7	0.4	1	NA	8/5/97	17.9	
R-CD-40A	K9705215-014	0.7	0.4	1	NA	8/5/97	ND	
R-GC-38A	K9705215-016	0.7	0.4	1	NA	8/5/97	0.6	J
WR-GC-37A	K9705215-018	0.7	0.4	1	NA	8/5/97	ND	
WR-GC-35A	K9705215-019	0.7	0.4	1	NA	8/5/97	37	
WR-GC-34A	K9705215-021	0.7	0.4	1	NA	8/5/97	17.0	
Method Blank	K9705215-MB	0.7	0.4	1	NA	8/5/97	ND	

Approved By: _____ Date: 8/8/97

1A/020597p

05215WET.J1 - Sample 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-39A
Lab Code: K9705215-001
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/13/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-42A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	0.8	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.3	1	7/29/97	8/7/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	30	25	1	7/29/97	8/13/97	ND	DT
'hlordane	EPA 3550A	8080A	10	5	1	7/29/97	8/13/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	11	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	12	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-42B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	2	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	0.5	J
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	0.5	J
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	0.6	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	60	5	1	7/29/97	8/13/97	ND	DT
Chlordane	EPA 3550A	8080A	10	10	1	7/29/97	8/13/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	26	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	31	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-42C	Units:	ug/Kg (ppb)
Lab Code:	K9705215-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	0.8	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.7	1	7/29/97	8/7/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.6	1	7/29/97	8/7/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	40	5	1	7/29/97	8/13/97	ND	DT
Chlordane	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	24	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	21	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-42D	Units:	ug/Kg (ppb)
Lab Code:	K9705215-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	2	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	3	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	4	0.4	1	7/29/97	8/7/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Methoxychlor	EPA 3550A	8080A	4	3	1	7/29/97	8/7/97	ND	DF
Toxaphene	EPA 3550A	8080A	170	5	1	7/29/97	8/13/97	ND	DT
'hlordane	EPA 3550A	8080A	30	2	1	7/29/97	8/13/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	90	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	156	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-D	Units:	ug/Kg (ppb)
Lab Code:	K9705215-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	0.3	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	2	1	7/29/97	8/7/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.5	1	7/29/97	8/7/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/13/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/13/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/13/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/13/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/13/97	ND	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-43A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	0.2	J
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	2	1	7/29/97	8/8/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	2	1	7/29/97	8/8/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	2	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-43B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Methoxychlor	EPA 3550A	8080A	6	1	1	7/29/97	8/8/97	ND	DF
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-41A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	0.5	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	0.4	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	ND	
Toxaphene	EPA 3550A	8080A	30	6	1	7/29/97	8/14/97	ND	DT
Chlordane	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	6	J
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	6	J

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-41B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.7	1	7/29/97	8/8/97	ND	DF
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	3	0.4	1	7/29/97	8/8/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	1	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	ND	
Toxaphene	EPA 3550A	8080A	30	30	1	7/29/97	8/14/97	ND	DT
Chlordane	EPA 3550A	8080A	10	7	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	11	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	16	

Approved By: PM Date: 082297

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-40A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-014	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result		Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND		
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND		
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	1		J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND		
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	13	10	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	4		
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	0.8		J
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	2		J
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	19		
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND		
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND		
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	1		J
Toxaphene	EPA 3550A	8080A	120	5	1	7/29/97	8/14/97	ND		DT
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/18/97	47		
Aroclor 1016	EPA 3550A	8080A	25	4	1	7/29/97	8/14/97	ND		DT
Aroclor 1221	EPA 3550A	8080A	20	2	1	7/29/97	8/14/97	ND		DT
Aroclor 1232	EPA 3550A	8080A	25	8	1	7/29/97	8/14/97	ND		DT
Aroclor 1242	EPA 3550A	8080A	40	3	1	7/29/97	8/14/97	ND		DT
Aroclor 1248	EPA 3550A	8080A	50	3	1	7/29/97	8/14/97	ND		DT
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	46		
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	15		

Approved By: PM Date: 082297

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-38A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-016	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	1	J
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
4,4'-DDD	EPA 3550A	8080A	3	0.2	1	7/29/97	8/8/97	ND	DF
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.3	1	7/29/97	8/8/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	ND	
Toxaphene	EPA 3550A	8080A	30	25	1	7/29/97	8/14/97	ND	DT
Chlordane	EPA 3550A	8080A	10	5	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	5	1	7/29/97	8/14/97	ND	DT
Aroclor 1221	EPA 3550A	8080A	20	2	1	7/29/97	8/14/97	ND	DT
Aroclor 1232	EPA 3550A	8080A	10	10	1	7/29/97	8/14/97	ND	DT
Aroclor 1242	EPA 3550A	8080A	10	10	1	7/29/97	8/14/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	10	1	7/29/97	8/14/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	15	2	1	7/29/97	8/14/97	ND	DT
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	10	

Approved By: Pm Date: 082297

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-37A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-018	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	0.4	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	0.2	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/14/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	5	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	4	J
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	6	J

Approved By: _____ Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-35A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-019	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	0.5	J
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	0.4	J
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	4	
Endrin	EPA 3550A	8080A	2	0.7	1	7/29/97	8/8/97	ND	DF
Endosulfan II	EPA 3550A	8080A	2	2	1	7/29/97	8/8/97	ND	DF
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	4	Total 6.1
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.7	1	7/29/97	8/8/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.7	1	7/29/97	8/8/97	ND	DF
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	ND	
Toxaphene	EPA 3550A	8080A	50	5	1	7/29/97	8/14/97	ND	DT
Chlordane	EPA 3550A	8080A	10	10	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	44	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	42	

Approved By: PM Date: 082297

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-34A
Lab Code: K9705215-021
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.6	1	7/29/97	8/8/97	ND	DF
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.7	1	7/29/97	8/8/97	ND	DF
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	2	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/8/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/8/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/8/97	ND	
Toxaphene	EPA 3550A	8080A	50	5	1	7/29/97	8/14/97	ND	DT
'hlordane	EPA 3550A	8080A	10	10	1	7/29/97	8/14/97	ND	DT
ıroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	14	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	23	

Approved By: PM Date: 682297

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	K970729-SB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-39A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	3	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	1	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	10	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	0.7	J
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	3	J
Phenanthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	42	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	12	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	41	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	48	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	15	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	16	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	9	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	11	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	20	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	14	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	3	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	16	

Approved By: _____ Date: 8-20-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-42A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	26	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	11	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	9	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	
[illegible]orene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	6	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	45	
[illegible]thracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	10	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	51	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	50	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	13	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	21	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	13	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	12	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	14	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	12	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	2	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	14	

Approved By: _____ 077 _____ Date: 8-20-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-42B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	11	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	11	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	6	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	9	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	51	
anracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	13	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	61	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	62	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	23	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	29	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	17	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	18	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	23	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	17	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	18	

Approved By: _____ Date: 8.20.97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-42C	Units:	ug/Kg (ppb)
Lab Code:	K9705215-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	23	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	24	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	6	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	11	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	6	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	11	
[illegible]nthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	74	
[illegible]racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	20	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	112	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	114	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	45	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	51	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	35	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	31	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	42	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	29	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	7	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	31	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-42D	Units:	ug/Kg (ppb)
Lab Code:	K9705215-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	44	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	22	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	7	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	14	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	10	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	15	
Phenanthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	90	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	19	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	101	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	93	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	35	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	39	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	25	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	25	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	34	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	23	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	26	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-D	Units:	ug/Kg (ppb)
Lab Code:	K9705215-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	212	210
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	20	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	32	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	93	63
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	13	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	50	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	208	
ıracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	56	
Fluoranthene	EPA 3545	SIM	5	0.6	10	7/29/97	8/7/97	310	
Pyrene	EPA 3545	SIM	5	0.8	10	7/29/97	8/7/97	450	430
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	135	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	149	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	91	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	92	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	168	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	116	69
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	15	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	121	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-43A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	25	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	10	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	2	J
›rene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	6	
ıanthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	35	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	13	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	172	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	149	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	50	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	62	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	32	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	30	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	29	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	22	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	21	

Approved By: _____ Date: 8·20·97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-43B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/6/97	4	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/6/97	3	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	4	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	ND	
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	2	J
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	10	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	5	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	25	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	38	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/6/97	15	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	19	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	13	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	12	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	19	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/6/97	16	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	2	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/6/97	17	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-41A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	5	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	3	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	2	J
[illegible]rene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	4	J
[illegible] anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	27	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	12	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	40	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	40	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	15	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	15	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	8	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	9	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	15	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	10	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	2	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	9	

Approved By: _____ Date: 8·20·97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-41B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	26	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	15	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/7/97	14	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	59	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	13	
rene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	41	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	226	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	52	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	193	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	160	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	44	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	45	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	28	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	28	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	44	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	37	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	6	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	44	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-CD-40A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-014	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	0.4	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	0.6	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/7/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	ND	
rene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	1	J
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	2	J
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	1	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	0.7	J
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	0.7	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	0.6	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	0.7	J

Approved By: _____ Date: 8·20·97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-38A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-016	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	9	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	3	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/7/97	8	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	19	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	2	J
[illegible]rene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	8	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	88	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	23	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	124	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	136	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	37	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	38	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/7/97	31	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/7/97	32	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	62	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/7/97	49	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/7/97	4	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/7/97	59	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-37A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-018	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	0.5	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
›rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
ıanthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	0.9	J
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	2	J
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	2	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	0.7	J
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	1	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	0.7	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	0.7	J

Approved By: _____ Date: 8·20·97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-35A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-019	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	32	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	25	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	6	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	10	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	8	
[illegible]orene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	10	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	82	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	19	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	110	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	104	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	49	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	54	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	37	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	35	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	42	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	30	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	7	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	29	

Approved By: _____ Date: 8·20·97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-34A	Units:	ug/Kg (ppb)
Lab Code:	K9705215-021	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	55	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	24	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	66	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	21	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	8	
·orene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	13	
ıanthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	124	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	42	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	217	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	237	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	157	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	137	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	88	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	108	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	170	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	96	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	17	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	87	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702022-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/5/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
·orene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
ıanthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702057-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/5/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/5/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/5/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/5/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/5/97	ND	

Approved By: _____ Date: 8-20-97

1S22/022897a

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97

Duplicate Summary
Total Solids (%)

Prep Method: NONE
Analysis Method: 160.3 M
Test Notes:

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Date Analyzed	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
WR-GC-34A	K9705215-021	7/29/97	61.9	62.8	62.4	1	

Approved By: JC Date: 7/30/97

Total Solids/0o0595
05215ICP JCI - TS DUP 7/30/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 8/4/97

Duplicate Summary
Carbon, Total Organic

Sample Name: Batch QC
Lab Code: K9705146-001DUP
Test Notes:

Units: PERCENT
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	1.80	1.73	1.76	4	

Approved By: _____ Date: 9/4/97

DUP/020597p
05215WET.LJ2 - DUP 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deeping/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	8/4/97

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	Batch QC	Units:	PERCENT
Lab Code:	K9705146-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	3.13	1.80	4.84	97	75-125	

Approved By: _____ Date: 9/4/97

MS/020597p
05215WET.LJ2 - MS 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: NA
Date Analyzed: 8/5/97

Duplicate Summary
Sulfide, Acid-Volatile

Sample Name: WR-GC-39A
Lab Code: K9705215-001DUP
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.7	0.8	0.6	0.7	29	

Approved By: _____ Date: 8/8/97

DUP/020597p
05215WET.J1 - DUP 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deeping/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	NA
		Date Analyzed:	8/5/97

Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name:	WR-GC-39A	Units:	mg/Kg (ppm)
Lab Code:	K9705215-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.7	8.3	0.8	8.3	88	60-125	

Approved By: _____ Date: 8/8/97

MS/020597p
05215WET.J1 - MS 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: 7/29/97
Date Analyzed: 7/31/97

Duplicate Summary
Total Metals

Sample Name: WR-CD-42B
Lab Code: K9705215-004
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Arsenic	3050A	200.8	0.5	ND	ND	ND	-	
Cadmium	3050A	200.8	0.02	0.19	0.19	0.19	<1	
Chromium	3050A	200.8	0.5	19.0	22.2	20.6	16	
Copper	3050A	200.8	0.1	20.9	21.5	21.2	3	
Lead	3050A	200.8	0.02	19.9	22.2	21.0	11	
Mercury	7471A	7471A	0.05	0.08	0.28	0.18	111	CI
Nickel	3050A	200.8	0.5	14.2	15.4	14.8	8	
Silver	3050A	200.8	0.02	0.25	0.26	0.26	4	
Zinc	3050A	200.8	0.5	131	136	134	4	

Approved By: _____ Date: 9/4/97

DUP/031695

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: 7/29/97
Date Analyzed: 7/31/97

Matrix Spike Summary
Total Metals

Sample Name: WR-CD-42B
Lab Code: K9705215-004
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic	3050A	200.8	0.5	22	ND	18.3	83	75-125	
Cadmium	3050A	200.8	0.02	5.4	0.19	5.17	92	75-125	
Chromium	3050A	200.8	0.5	22	19.0	42.8	109	75-125	
Copper	3050A	200.8	0.1	27	20.9	44.9	89	75-125	
Lead	3050A	200.8	0.02	54	19.9	73.4	99	75-125	
Mercury	7471A	7471A	0.05	0.38	0.08	0.44	95	75-125	
Nickel	3050A	200.8	0.5	54	14.2	63.4	91	75-125	
Silver	3050A	200.8	0.02	5.4	0.25	5.18	91	75-125	
Zinc	3050A	200.8	0.5	54	131	184	98	75-125	

Approved By: _____ Date: 9/4/97

MS/031695
05215ICP.GJ1 - Spike 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	7/31/97

Laboratory Control Sample Summary
Total Metals

Sample Name:	Laboratory Control Sample	Units:	mg/Kg (ppm)
Lab Code:	K9705215-LCS	Basis:	Dry
Test Notes:			

Source: Environmental Resource Associates

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Control Limits	Result Notes
Arsenic	3050A	200.8	62.7	55.6	89	70-130	
Cadmium	3050A	200.8	77.4	69.5	90	66-133	
Chromium	3050A	200.8	76.9	75.5	98	77-123	
Copper	3050A	200.8	58.2	52.6	90	79-121	
Lead	3050A	200.8	122	112	92	68-131	
Mercury	7471A	7471A	2.51	2.36	94	64-136	
Nickel	3050A	200.8	163	152	93	75-125	
Silver	3050A	200.8	69.6	70.5	101	74-126	
Zinc	3050A	200.8	114	99.8	88	74-126	

Approved By: S Date: 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: 7/29/97
Date Analyzed: 8/7-8/97

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Prep Method: EPA 3550A
Analysis Method: 8080A

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tetrachloro-m-xylene	Percent Recovery Decachlorobiphenyl
WR-GC-39A	K9705215-001		54	71
WR-CD-42A	K9705215-003		51	63
WR-CD-42B	K9705215-004		51	59
WR-CD-42C	K9705215-005		28	35
WR-CD-42D	K9705215-006		50	63
WR-D	K9705215-007		52	62
WR-CD-43A	K9705215-008		51	61
WR-CD-43B	K9705215-009		51	64
WR-CD-41A	K9705215-011		67	72
WR-CD-41B	K9705215-012		48	55
WR-CD-40A	K9705215-014		58	67
WR-GC-38A	K9705215-016		50	66
WR-GC-37A	K9705215-018		66	73
WR-GC-35A	K9705215-019		60	81
WR-GC-34A	K9705215-021		43	48
WR-CD-43B	K9705215-009MS		66	73
WR-CD-43B	K9705215-009DMS		65	70
Lab Control Sample	K970729-SL		57	69
Method Blank	K970729-SB		63	78

CAS Acceptance Limits: 20-107 20-142

Approved By: PM Date: 082297

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	7/23/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	7/29/97
		Date Analyzed:	8/8/97

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-CD-43B	Units:	ug/Kg (ppb)
Lab Code:	K9705215-009MS, K9705215-009DMS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-141	10	
Heptachlor	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-108	10	
Aldrin	EPA 3550A	8080A	2	13	13	ND	9	9	69	69	20-181	<1	
Dieldrin	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-183	10	
Endrin	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-164	10	
4,4'-DDT	EPA 3550A	8080A	2	13	13	ND	10	9	77	69	20-185	11	

Reviewed By: _____ Date: 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/7/97

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	K970729-SL	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	13	9	69	21-123	
Heptachlor	EPA 3550A	8080A	13	9	69	31-112	
Aldrin	EPA 3550A	8080A	13	8	62	26-127	
Dieldrin	EPA 3550A	8080A	13	10	77	20-161	
Endrin	EPA 3550A	8080A	13	10	77	32-135	
4,4'-DDT	EPA 3550A	8080A	13	10	77	30-146	

Approved By: _____ Date: 8/21/97

00067

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: 7/29/97
Date Analyzed: 8/5 - 8/7/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-GC-39A	K9705215-001		27	37	30
WR-CD-42A	K9705215-003		35	50	44
WR-CD-42B	K9705215-004		34	42	39
WR-CD-42C	K9705215-005		40	41	41
WR-CD-42D	K9705215-006		34	42	36
WR-D	K9705215-007		45	54	41
WR-CD-43A	K9705215-008		35	41	40
WR-CD-41A	K9705215-011		30	42	35
W[illegible]D-41B	K9705215-012		45	58	47
[illegible]-40A	K9705215-014		21	35	35
WR-GC-38A	K9705215-016		28	33	33
Batch QC	K9705146-001		44	54	43
Batch QC	K9705146-001MS		46	53	47
Batch QC	K9705146-001DMS		47	59	48
Lab Control Sample	KWG9702022-3		41	49	42
Method Blank	KWG9702022-4		35	49	52
CAS Acceptance Limits:			13-142	13-142	15-145

Approved By: _____ Date: 8·20·97

SUR3/050897a
05215SVM WN2 - SUR 8/20/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705215
Date Collected: 7/23/97
Date Received: 7/24/97
Date Extracted: 7/31/97
Date Analyzed: 8/5 - 8/7/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-CD-43B	K9705215-009		33	45	37
WR-GC-37A	K9705215-018		32	40	33
WR-GC-35A	K9705215-019		41	44	35
WR-GC-34A	K9705215-021		28	39	38
Batch QC	K9705278-001		43	56	47
Batch QC	K9705278-001MS		44	48	38
Batch QC	K9705278-001DMS		41	47	40
Lab Control Sample	KWG9702057-3		33	42	35
[illegible] Blank	KWG9702057-4		49	53	51
CAS Acceptance Limits:			13-142	13-142	15-145

Approved By: [signature] Date: 8-20-97

00069

SUR3/050897a
05215SVM WN3 - SUR 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC		Units:	ug/Kg (ppb)
Lab Code:	K9705146-001MS	K9705146-001DMS	Basis:	Dry
Test Notes:				

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Acenaphthene	EPA 3545	SIM	5	470	410	8	173	122	35	28	12-133	22	
Pyrene	EPA 3545	SIM	5	470	410	87	307	238	47	37	10-160	24	
Benzo(a)pyrene	EPA 3545	SIM	5	470	410	43	251	201	44	39	10-160	12	

Approved By: _____ Date: 8-20-97

DMS/031497a
05215SVM WN2 - DMS 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/31/97
		Date Analyzed:	8/6/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC		Units:	ug/Kg (ppb)
Lab Code:	K9705278-001MS	K9705278-001DMS	Basis:	Dry
Test Notes:				

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Acenaphthene	EPA 3545	SIM	5	400	410	16	187	200	43	45	12-133	5	
Pyrene	EPA 3545	SIM	5	400	410	93	271	346	44	62	10-160	34	
Benzo(a)pyrene	EPA 3545	SIM	5	400	410	33	216	258	46	55	10-160	18	

Approved By: _____ Date: 8-20-97

DMS/031497a
05215SVM WN3 - DMS 8/19/97

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00071

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	KWG9702022-3	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	30	36	36-119	
Pyrene	EPA 3545	SIM	83	38	46	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	40	48	24-137	

Approved By: _____ Date: 8.20.97

LCS/031497a
05215SVM WN2 - LCS 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705215
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/31/97
		Date Analyzed:	8/5/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	KWG9702057-3	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	25	30	36-119	EU
Pyrene	EPA 3545	SIM	83	32	39	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	34	41	24-137	

Approved By: _____ Date: 8-28-97

LCS/031497a
05215SVM.WN3 - LCS 8/19/97

APPENDIX B

CHAIN OF CUSTODY INFORMATION

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/23/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fujii

COMPANY/ADDRESS Hart Crowser Inc.
1910 Fairview Ave. E. Seattle, WA 98102

PHONE (206) 324-9530

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA/418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐ Semi Pest/ VOA ☐ Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-39 A	7/23/97	AM	1	Sediment	5		✓		✓						✓							
WR-GC-39 Z	"	"	2	"	1		✓		✓		Grab No				✓							
WR-CD-42A	"	"	3	"	5		✓		✓						✓							
WR-CD-42B	"	"	4	"	5		✓		✓						✓							
WR-CD-42C	"	"	5	"	5		✓		✓						✓							
WR-CD-42D	"	"	6	"	5		✓		✓						✓							
WR-D	"	PM	7	"	5		✓		✓						✓							
WR-CD-43A	"	"	8	"	5		✓		✓						✓							
WR-CD-43B	"	"	9	"	5		✓		✓						✓							
WR-CD-43Z	"	"	10	"	1																	

RELINQUISHED BY:
Signature
Grant Wilkerson
Printed Name
Hart Crowser, Inc.
Firm
7/23/97 1940
Date/Time

RECEIVED BY:
Kimberly Olson
Signature
KIMBERLY OLSON
Printed Name
CAS
Firm
24 JULY 1997 8:00
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: K9705215

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/23/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fujii

COMPANY/ADDRESS Hart Crowser, Inc.
1910 - Fairview Ave. E, Seattle, WA 98102

PHONE 206-324-9530

SAMPLERS SIGNATURE [signature]

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA/418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐ Semi Pest/ VOA ☐ Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-CD-41 A	7/23/97	PM	11	Sediment	5		✓		✓						✓							
WR-CD-41B			12		5		✓		✓						✓							
WR-CD-41Z			13		1																	
WR-CD-40A			14		5		✓		✓						✓							
WR-CD-40Z			15		1																	
WR-GC-38A			16		5		✓		✓						✓							
WR-GC-38Z			17		1																	
WR-GC-37A			18		5		✓		✓						✓							
WR-GC-37Z			~~19~~ didn't	receive	1		✓		✓		No GW				✓							
WR-GC-35A			20	19	5		✓		✓						✓							

RELINQUISHED BY:
Signature [signature]
Printed Name Grant W. Gnechtel
Firm Hart Crowser, Inc.
Date/Time 7/23/97 1940

RECEIVED BY:
Signature Kimberly Olson
Printed Name KIMBERLY OLSON
Firm CAS
Date/Time 24 JULY 1997 8:00

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: K9705215

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

Didn't receive WR-GC-37Z @ CAS-Kelso. UCH/CAS

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/23/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fujii

COMPANY/ADDRESS Hart Crowser, Inc.
1910 Fairview Ave. E, Seattle, WA 98102

PHONE 206-324-9530

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA/418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-35Z	7/23/97	PM	2D	Sediment	1																	
WR-GC-34A	"	"	2E21	"	5		/		/						/							

114

RELINQUISHED BY:
Signature
Grant W. Kneebtel
Printed Name
Hart Crowser, Inc.
Firm
7/23/97 1940
Date/Time

RECEIVED BY:
Kimberly Olson
Signature
KIMBERLY OLSON
Printed Name
CAS
Firm
24 JULY 1997 8:00
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: K9705215

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client Hart Crowser / Channel Deepening Work Order K97-5215

Cooler received on 7/24 and opened on 7/24 by Jenne S.

1. Were custody seals on outside of cooler? YES NO
   If yes, how many and where? 1 top, front
2. Were signature & date correct? YES NO
3. Were custody papers properly filled out (ink, signed, etc)? YES NO
4. Did all bottles arrive in good condition (unbroken)? YES NO
5. Were all bottle labels complete (*i.e.* analysis, preservation, etc)? YES NO
6. Did all bottle labels and tags agree with custody papers? YES NO
7. Were correct bottles used for the tests indicated? YES NO
8. Were VOA vials checked for absence of air bubbles, and noted if so? ~~YES NO~~
9. Did the bottles originate from CAS/Kelso or a branch laboratory? YES NO
10. Chain-of-custody identification number:

Temperature of cooler(s) upon receipt:	12.3°	13.5°	18.2°	12.2	
Temperature Blank:					
Is the temperature within 4 ± 2° C?:	Yes ☐ No ☑	Yes ☐ No ☑	Yes ☐ No ☑	Yes ☐ No ☑	Yes ☐ No ☐

Explain any discrepancies

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					

YES = All samples OK
NO = Samples were preserved at lab as listed

VOC Vial pH Verification (Tested after Analysis) ☐ All Samples pH ≤ 2 ☐ Following Samples Exhibited pH > 2			Samples received outside of temperature range all samples	Sample I.D.

115

115

00073

COLUMBIA ANALYTICAL SERVICES, INC.

Service Request #: K9705215 Extr/Analysis Lot MET9704176 Method: EPA METHOD 160.3 MODIFIED

Analysis For: Total Solids

Pan ID	Lab Code	Wet Weight (g)	Tare (g)	Tare + Dry Wt.(g)	Dry Weight (g)	% Total Solids
	5215-1	11.21	1.32	10.07	8.75	78.1
	3	12.59	1.30	8.79	7.49	59.5
	4	10.49	1.29	7.88	6.59	62.8
	5	11.42	1.32	8.47	7.15	62.6
	6	10.49	1.28	7.97	6.69	63.8
	7	10.30	1.27	10.46	9.19	89.2
	8	11.59	1.32	11.34	10.02	86.5
	9	11.27	1.30	11.41	10.11	89.7
	11	11.88	1.29	9.99	8.70	73.2
	12	10.19	1.31	7.44	6.13	60.2
	14	11.47	1.28	10.68	9.40	82.0
	16	10.85	1.28	9.01	7.73	71.2
	18	11.62	1.34	10.79	9.45	81.3
	19	11.70	1.30	7.83	6.53	55.8
	21	11.63	1.30	8.50	7.20	61.9
	d 21	10.90	1.30	8.14	6.84	62.8

Oven Temp: 103° Time In: 3:05 p.m. Time Out: 9:00 A.m.

Comments:

$\bar{x}$ RPD =

116

$\bar{x}$ RPD =

$\bar{x}$ RPD =

Analyst: Debi Richards / CBaird Date: 7-29-97

Reviewed By: Date: 7/30/97

116

Tspen 00079

HEADER SHEET FOR SEDIMENT SAMPLING TRIP

PROJECT LOCATION: CRCD-Willamette River

SAMPLING DATE: 7/24/97

SAMPLING METHOD (PONAR/BOX CORE/GRAVITY CORE/VIBRA CORE):

SAMPLING ANALYSIS (SAMPLE NUMBERS ANALYZED)

GRAIN SIZE:

OIL/GREASE:

AMMONIA (NH4):

SULFIDE: WR-A, B; WR-BC-1, 3, 7, 8, 9, 10, 12, 15, 16, 20; WR-GC-2A, 2B, 4A, 4B, 5A, 5B, 6A, 6B, 11A, 25A

TOTAL ORGANIC CARBON (TOC): "

VOLATILE SOLIDS: SAME AS GRAIN SIZE

METALS: SAME AS SULFIDE

PESTICIDES: "

PAH'S: "

ELUTRIATES:

BIOLOGICAL:

SEDIMENT QUALITY dBASE FILES:

Rec'd 9/10/97

Columbia Analytical Services inc.

September 5, 1997

Service Request No: K9705238

Mark Siipola
U.S. Army Corps of Engineers
333 SW First Avenue, Robert Duncan Plaza
Portland, OR 97204

Re: Channel Deepening/5672

Dear Mark:

Enclosed are the results of the sample(s) submitted to our laboratory on . For your reference, these analyses have been assigned our service request number K9705238.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Elizabeth Schneider
Project Chemist

ES/lj

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Hart Crowser, Inc.	**Service Request No.:**	K9705238
Project:	Channel Deepening/5672	**Date Received:**	7/24/97
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier IIA data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

The Batch QC associated with the SIM analysis contained severe matrix interferences that hindered the quantitation of the Fluorene-d10 and Fluoranthene-d10 surrogates and the Acenaphthene target in the MS/DMS. Since all other QC associated with this batch was within acceptance limits, no further corrective action was taken.

The LCS associated with the SIM analysis performed on 8/18/97 yielded slightly low recovery for Acenaphthene. Since the Acenaphthene recoveries in the associated MS/DMS were within acceptance limits, no further corrective action was taken.

Approved by _____ Date 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Date Analyzed	Result	Result Notes
WR-BC-20	K9705238-001	7/28/97	72.7	
WR-BC-15	K9705238-002	7/28/97	46.2	
WR-BC-10	K9705238-003	7/28/97	47.1	
WR-B	K9705238-004	7/28/97	48.9	
WR-BC-09	K9705238-005	7/28/97	53.9	
WR-BC-08	K9705238-006	7/28/97	54.2	
WR-BC-07	K9705238-007	7/28/97	51.5	
WR-BC-01	K9705238-008	7/28/97	75.1	
WR-A	K9705238-009	7/28/97	73.0	
WR-BC-03	K9705238-010	7/28/97	66.6	
WR-BC-12	K9705238-011	7/28/97	70.1	
WR-BC-16	K9705238-012	7/28/97	57.9	
WR-GC-11A	K9705238-013	7/28/97	55.2	
WR-GC-25A	K9705238-015	7/28/97	54.8	
WR-GC-02A	K9705238-017	7/28/97	69.1	
WR-GC-02B	K9705238-018	7/28/97	77.0	
WR-GC-04A	K9705238-019	7/28/97	63.7	
WR-GC-04B	K9705238-020	7/28/97	62.3	
WR-GC-05A	K9705238-022	7/28/97	66.7	
WR-GC-05B	K9705238-023	7/28/97	68.6	
WR-GC-06A	K9705238-024	7/28/97	55.0	
WR-GC-06B	K9705238-025	7/28/97	53.4	

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Approved By: _____ Date: 7/30/97

TSSample/021397a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Carbon, Total Organic

Prep Method: NONE
Analysis Method: ASTM D4129-82M
Test Notes:

Units: PERCENT
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-BC-20	K9705238-001	0.05	0.05	1	NA	8/6/97	0.38	
WR-BC-15	K9705238-002	0.05	0.05	1	NA	8/6/97	1.78	
WR-BC-10	K9705238-003	0.05	0.05	1	NA	8/6/97	1.59	
WR-B	K9705238-004	0.05	0.05	1	NA	8/6/97	1.84	
WR-BC-09	K9705238-005	0.05	0.05	1	NA	8/6/97	1.26	
WR-BC-08	K9705238-006	0.05	0.05	1	NA	8/6/97	1.20	
WR-BC-07	K9705238-007	0.05	0.05	1	NA	8/6/97	1.33	
WR-BC-01	K9705238-008	0.05	0.05	1	NA	8/6/97	0.13	
WR-A	K9705238-009	0.05	0.05	1	NA	8/6/97	0.16	
WR-BC-03	K9705238-010	0.05	0.05	1	NA	8/6/97	0.38	
R-BC-12	K9705238-011	0.05	0.05	1	NA	8/6/97	0.37	
R-BC-16	K9705238-012	0.05	0.05	1	NA	8/6/97	0.54	
WR-GC-11A	K9705238-013	0.05	0.05	1	NA	8/7/97	1.62	
WR-GC-25A	K9705238-015	0.05	0.05	1	NA	8/7/97	2.08	
WR-GC-02A	K9705238-017	0.05	0.05	1	NA	8/7/97	0.59	
WR-GC-02B	K9705238-018	0.05	0.05	1	NA	8/7/97	0.14	
WR-GC-04A	K9705238-019	0.05	0.05	1	NA	8/7/97	0.99	
WR-GC-04B	K9705238-020	0.05	0.05	1	NA	8/7/97	0.92	
WR-GC-05A	K9705238-022	0.05	0.05	1	NA	8/7/97	0.99	
WR-GC-05B	K9705238-023	0.05	0.05	1	NA	8/7/97	0.88	
WR-GC-06A	K9705238-024	0.05	0.05	1	NA	8/7/97	0.26	
WR-GC-06B	K9705238-025	0.05	0.05	1	NA	8/7/97	0.06	
Method Blank 1	K9705238-MB1	0.05	0.05	1	NA	8/6/97	ND	
Method Blank 2	K9705238-MB2	0.05	0.05	1	NA	8/7/97	ND	

M Modified

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Approved By: _____ Date: 7/8/97

1A/020597p

05238WET.LJ2 - Sample 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Sulfide, Acid-Volatile

Prep Method: NONE
Analysis Method: Draft Aug 91
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-BC-20	K9705238-001	0.7	0.6	1	NA	8/6/97	0.9	
WR-BC-15	K9705238-002	1.1	0.9	1	NA	8/6/97	17.5	
WR-BC-10	K9705238-003	1.1	0.9	2	NA	8/6/97	47	
WR-B	K9705238-004	1.1	0.9	1	NA	8/6/97	47	
WR-BC-09	K9705238-005	1.0	0.8	1	NA	8/7/97	2.9	
WR-BC-08	K9705238-006	1.0	0.8	1	NA	8/7/97	14.8	
WR-BC-07	K9705238-007	1.0	0.8	4	NA	8/7/97	65	
WR-BC-01	K9705238-008	0.7	0.6	1	NA	8/7/97	ND	
WR-A	K9705238-009	0.7	0.6	1	NA	8/7/97	ND	
WR-BC-03	K9705238-010	0.8	0.7	1	NA	8/6/97	ND	
R-BC-12	K9705238-011	0.8	0.7	1	NA	8/7/97	4.6	
R-BC-16	K9705238-012	0.9	0.8	1	NA	8/7/97	2.2	
WR-GC-11A	K9705238-013	1.0	0.8	1	NA	8/7/97	10.2	
WR-GC-25A	K9705238-015	1.0	0.8	4	NA	8/7/97	19	
WR-GC-02A	K9705238-017	0.8	0.7	2	NA	8/7/97	19	
WR-GC-02B	K9705238-018	0.7	0.6	1	NA	8/7/97	0.8	
WR-GC-04A	K9705238-019	0.8	0.7	4	NA	8/7/97	53	
WR-GC-04B	K9705238-020	0.9	0.8	2	NA	8/7/97	30	
WR-GC-05A	K9705238-022	0.8	0.7	1	NA	8/7/97	4.8	
WR-GC-05B	K9705238-023	0.8	0.7	1	NA	8/7/97	0.8	
WR-GC-06A	K9705238-024	1.0	0.8	1	NA	8/7/97	1.9	
WR-GC-06B	K9705238-025	1.0	0.8	1	NA	8/7/97	ND	
Method Blank 1	K9705238-MB1	0.5	0.4	1	NA	8/6/97	ND	
Method Blank 2	K9705238-MB2	0.5	0.4	1	NA	8/7/97	ND	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Total Metals

Sample Name: WR-BC-20
Lab Code: K9705238-001
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.1	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.09	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	16.7	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	15.2	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	8.96	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.11	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	14.0	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.07	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	54.9	

Approved By: _____ Date: 9/8/97

1S44mc/031695

D5238ICP.GJ1 - Sample 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-15	Units:	mg/Kg (ppm)
Lab Code:	K9705238-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.8	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.41	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	33.2	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	39.0	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	21.2	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	23.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.31	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	131	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-10	Units:	mg/Kg (ppm)
Lab Code:	K9705238-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	4.0	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.71	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	33.0	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	36.7	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	20.7	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.09	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	22.5	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.28	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	137	

Approved By: _____ Date: 9/8/97

1S44mc/031695

0523ICP.G11 - Sample (3) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-B	Units:	mg/Kg (ppm)
Lab Code:	K9705238-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	3.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.67	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	26.8	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	33.0	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	19.7	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.25	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	128	

Approved By: 126 Date: 9/4/97 00009

1S44inc/031695

05238ICP G11 - Sample (4) 9/4/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-09	Units:	mg/Kg (ppm)
Lab Code:	K9705238-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	3.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.54	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	28.4	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	27.2	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	14.8	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.06	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.16	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	101	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Total Metals

Sample Name: WR-BC-08
Lab Code: K9705238-006
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.65	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	28.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	28.2	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	15.9	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.06	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	20.9	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.16	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	115	

Approved By: _____ Date: 9/8/97

1S44me/031695
0523RICP.GJJ - Sample (6) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-07	Units:	mg/Kg (ppm)
Lab Code:	K9705238-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	0.6	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.93	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	27.6	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	30.4	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	19.6	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.21	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	139	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-01	Units:	mg/Kg (ppm)
Lab Code:	K9705238-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	1.0	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.19	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	10.5	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	8.0	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	5.03	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	9.0	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.04	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	51.0	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	1.2	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.21	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	11.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	8.8	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	5.3	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.02	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	9.4	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.05	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	52.6	

Approved By: _____ Date: 9/8/97

1S44mc/031695

05238ICP.GJ1 - Sample (9) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-03	Units:	mg/Kg (ppm)
Lab Code:	K9705238-010	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.33	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	17.8	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	16.3	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	10.5	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	16.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.11	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	89.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-12	Units:	mg/Kg (ppm)
Lab Code:	K9705238-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	2.6	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.22	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	20.4	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	20.8	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	11.6	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.07	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	17.4	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.10	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	79.1	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-BC-16	Units:	mg/Kg (ppm)
Lab Code:	K9705238-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	3.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.16	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	21.3	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	20.9	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	9.19	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.17	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	19.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.10	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	76.5	

Approved By: _____ Date: 9/8/97

1S44mc/031695

052381CP GJ1 - Sample 112) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-11A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-013	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	2.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.43	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	28.1	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	31.6	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	22.0	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.09	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	21.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.25	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	120	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Total Metals

Sample Name: WR-GC-25A
Lab Code: K9705238-015
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	3.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.33	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	30.7	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	36.3	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	27.7	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.18	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	22.2	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.35	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	150	

Approved By: _____ Date: 9/4/97

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05238ICP.GJ1 - Sample (14) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-02A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-017	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	2.4	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.50	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	15.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	13.2	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	10.1	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.06	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	12.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.08	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	92.1	

Approved By: S Date: 9/8/97

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05238ICP JC1 - Sample (15) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-02B	Units:	mg/Kg (ppm)
Lab Code:	K9705238-018	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	1.1	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	0.10	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	12.2	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	8.9	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	3.37	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.04	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	9.2	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.04	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	34.5	

Approved By: _____ Date: 9/8/97

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05238ICP.JC1 - Sample (16) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-04A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-019	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	5.8	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	1.36	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	26.8	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	24.0	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	27.0	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.13	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	18.1	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.18	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	166	

Approved By: _____ Date: 9/9/97

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05238ICP JC1 - Sample (17) 9/4/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-04B	Units:	mg/Kg (ppm)
Lab Code:	K9705238-020	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	5.6	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	1.62	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	8/1/97	24.3	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	8/1/97	26.4	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	8/1/97	23.7	
Mercury	7471A	7471A	0.05	0.01	1	8/11/97	8/11/97	0.12	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	8/1/97	17.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	8/1/97	0.15	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	8/1/97	138	

Approved By: _____ Date: 9/8/97

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0523ICP.JC1 - Sample (18) 9/4/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-05A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-022	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	3.2	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.23	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	25.2	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	24.6	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	9.09	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.07	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.14	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	61.2	

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052381CP.JC1 - Sample (19) 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-05B	Units:	mg/Kg (ppm)
Lab Code:	K9705238-023	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	0.6	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.16	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	24.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	24.5	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	7.07	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.3	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.16	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	53.6	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-06A	Units:	mg/Kg (ppm)
Lab Code:	K9705238-024	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	1.3	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.13	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	11.4	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	14.5	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	3.65	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	9.3	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.08	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	30.4	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Total Metals

Sample Name:	WR-GC-06B	Units:	mg/Kg (ppm)
Lab Code:	K9705238-025	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	1.3	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.03	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	6.6	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	9.4	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	1.24	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.01	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	4.4	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.03	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	10.8	

Approved By: _____ Date: 9/9/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Total Metals

Sample Name:	Method Blank #1	Units:	mg/Kg (ppm)
Lab Code:	K9705238-MB1	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	ND	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	ND	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	ND	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	ND	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	ND	

Approved By: _____ Date: 9/9/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-20	Units:	ug/Kg (ppb)
Lab Code:	K9705238-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	0.7	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	2	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	0.7	J
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	2	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/5/97	1	J
Toxaphene	EPA 3550A	8080A	30	16	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	10	1	7/29/97	8/7/97	ND	DF
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	6	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	7	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	4	J

Approved By: [signature] Date: 8/13/97 00030

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-15	Units:	ug/Kg (ppb)
Lab Code:	K9705238-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	0.5	J
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	1	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	35	5	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	15	2	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	9	J

Approved By: _____ Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-10	Units:	ug/Kg (ppb)
Lab Code:	K9705238-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.4	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	2	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	30	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	15	2	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	11	

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-B
Lab Code: K9705238-004
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.4	J
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	30	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	12	2	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	9	J

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-09	Units:	ug/Kg (ppb)
Lab Code:	K9705238-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.4	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	15	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	6	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	4	J

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Approved By: [signature] Date: 8/13/97 00034

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-08	Units:	ug/Kg (ppb)
Lab Code:	K9705238-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	0.4	J
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.4	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	15	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	6	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	5	J

Approved By: [signature] Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-BC-07
Lab Code: K9705238-007
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.4	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	15	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	9	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	7	J

Approved By: _____ Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-01	Units:	ug/Kg (ppb)
Lab Code:	K9705238-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/6/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/6/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/6/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/6/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/6/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/6/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/6/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/6/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/6/97	ND	

Approved By: [signature] Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-BC-03
Lab Code: K9705238-010
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.2	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	0.4	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.7	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-12	Units:	ug/Kg (ppb)
Lab Code:	K9705238-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	0.7	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.2	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	20	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	DF
Aroclor 1242	EPA 3550A	8080A	10	6	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	7	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	10	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	5	J

Approved By: _____ Date: 8/13/97 00040

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-16	Units:	ug/Kg (ppb)
Lab Code:	K9705238-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.2	J
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.3	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	15	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	7	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	4	J

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-11A
Lab Code: K9705238-013
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	0.5	J
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	40	5	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	5	1	7/29/97	8/7/97	ND	DF
\roclor 1016	EPA 3550A	8080A	10	7	1	7/29/97	8/7/97	ND	DF
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	7	J
Aroclor 1248	EPA 3550A	8080A	10	10	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	21	

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-25A
Lab Code: K9705238-015
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result		Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	3		J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	0.9	r/	J
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	2		J
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	4	56	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	6.7	J
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND		
Toxaphene	EPA 3550A	8080A	60	5	1	7/29/97	8/7/97	ND		DF
Chlordane	EPA 3550A	8080A	20	2	1	7/29/97	8/7/97	ND		DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND		
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND		
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND		
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	26		
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND		
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND		
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	52		

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-02A
Lab Code: K9705238-017
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	0.7	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	12	1	7/29/97	8/7/97	ND	DF
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	9	1	7/29/97	8/7/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	5	J

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-02B
Lab Code: K9705238-018
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-04A
Lab Code: K9705238-019
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result		Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	7	12	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	5		J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND		
Toxaphene	EPA 3550A	8080A	65	5	1	7/29/97	8/7/97	ND		DF
Chlordane	EPA 3550A	8080A	10	7	1	7/29/97	8/7/97	ND		DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND		
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND		
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND		
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	29		
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND		
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	43		
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND		

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-04B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-020	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result		Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	4	11	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	SL 6.9	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	7		J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND		
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND		
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND		
Toxaphene	EPA 3550A	8080A	30	15	1	7/29/97	8/7/97	ND		DF
Chlordane	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND		DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND		
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND		
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND		
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND		
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND		
Aroclor 1254	EPA 3550A	8080A	15	2	1	7/29/97	8/7/97	ND		DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	7		J

Approved By: [signature] Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-05A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-022	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/12/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-05B
Lab Code: K9705238-023
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/6/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/6/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/6/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
\roclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/13/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	K970729-SB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/5/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: _____ Date: 8/13/97

1S44/052595

05238SVG JS5 - MB 8/12/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-06A
Lab Code: K9705238-024
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/14/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	5	1	7/29/97	8/14/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	

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Approved By: Jay Date: 8-20-97 00051

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-06B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-025	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/14/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/14/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/14/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/14/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/14/97	ND	

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Approved By: JPS 168 Date: 8-20-97 00052

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	K970729-MB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/29/97	8/7/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/29/97	8/7/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/29/97	8/7/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/29/97	8/7/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/29/97	8/7/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/29/97	8/7/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/29/97	8/7/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/29/97	8/7/97	ND	

Approved By: Jay Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-20	Units:	ug/L (ppb)
Lab Code:	K9705238-001	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

Approved By: Jay 170 Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-15	Units:	ug/L (ppb)
Lab Code:	K9705238-002	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	0.14	

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Approved By: Jay Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-10	Units:	ug/L (ppb)
Lab Code:	K9705238-003	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	0.10	

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Approved By: Jay Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-09	Units:	ug/L (ppb)
Lab Code:	K9705238-005	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

Approved By: Jay 173 Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-B	Units:	ug/L (ppb)
Lab Code:	K9705238-004	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	0.10	

Approved By: Jay 174 Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-08	Units:	ug/L (ppb)
Lab Code:	K9705238-006	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

Approved By: Jay Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-07	Units:	ug/L (ppb)
Lab Code:	K9705238-007	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: Jay Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-01	Units:	ug/L (ppb)
Lab Code:	K9705238-008	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: JPS Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-A	Units:	ug/L (ppb)
Lab Code:	K9705238-009	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: Jay Date: 8-12-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-03	Units:	ug/L (ppb)
Lab Code:	K9705238-010	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: Jay Date: 8-12-97

1S22/052595

052385VG JS3 - 10 8/12/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-12	Units:	ug/L (ppb)
Lab Code:	K9705238-011	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

Approved By: Jay Date: 8.12.97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Butyltins

Sample Name:	WR-BC-16	Units:	ug/L (ppb)
Lab Code:	K9705238-012	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: JAS Date: 8-12-97

1S22/052595

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Butyltins

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	K970806-WB	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	1	8/6/97	8/9/97	ND	

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Approved By: _____ Date: 9/8/97

1S22/052595

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05238SVG JS2 - MB 9/4/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-20	Units:	ug/Kg (ppb)
Lab Code:	K9705238-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	280	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	135	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	406	
Acenaphthene	EPA 3545	SIM	500	0.5	100	8/11/97	8/20/97	1700	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	85	
Fluorene	EPA 3545	SIM	500	0.5	100	8/11/97	8/20/97	940	
Phenanthrene	EPA 3545	SIM	500	0.8	100	8/11/97	8/20/97	8200	
Anthracene	EPA 3545	SIM	500	0.6	100	8/11/97	8/20/97	4400	
Fluoranthene	EPA 3545	SIM	500	0.6	100	8/11/97	8/20/97	14000	
Pyrene	EPA 3545	SIM	500	0.8	100	8/11/97	8/20/97	15000	
Benz(a)anthracene	EPA 3545	SIM	500	0.7	100	8/11/97	8/20/97	4200	
Chrysene	EPA 3545	SIM	500	0.6	100	8/11/97	8/20/97	5400	
Benzo(b)fluoranthene	EPA 3545	SIM	500	0.8	100	8/11/97	8/20/97	2800	
Benzo(k)fluoranthene	EPA 3545	SIM	500	0.6	100	8/11/97	8/20/97	3800	
Benzo(a)pyrene	EPA 3545	SIM	500	0.5	100	8/11/97	8/20/97	6200	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	500	0.7	100	8/11/97	8/20/97	4500	
Dibenz(a,h)anthracene	EPA 3545	SIM	500	0.5	100	8/11/97	8/20/97	690	
Benzo(g,h,i)perylene	EPA 3545	SIM	500	0.4	100	8/11/97	8/20/97	4500	

Approved By: _____ Date: 9-2-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-15	Units:	ug/Kg (ppb)
Lab Code:	K9705238-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	98	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	50	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	107	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	112	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	35	
[illegible]rene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	77	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	495	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	161	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	1100	
Pyrene	EPA 3545	SIM	50	0.8	10	8/11/97	8/20/97	1300	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	709	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	778	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	995	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	967	
Benzo(a)pyrene	EPA 3545	SIM	50	0.5	10	8/11/97	8/20/97	1100	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	50	0.7	10	8/11/97	8/20/97	880	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	207	
Benzo(g,h,i)perylene	EPA 3545	SIM	50	0.4	10	8/11/97	8/20/97	860	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-10	Units:	ug/Kg (ppb)
Lab Code:	K9705238-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	23	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	22	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	25	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	14	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	7	
[illegible]orene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	16	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	120	
[illegible]thracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	36	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	208	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	265	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	158	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	180	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	270	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	269	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	459	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	383	67
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	66	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	385	

Approved By: [signature] Date: 9-2-97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	19	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	21	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	14	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	11	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	6	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	14	
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	105	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	29	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	150	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	172	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	90	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	105	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	165	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	159	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	251	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	211	69
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	39	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	210	

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Approved By: _____ Date: 9·2·97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-09	Units:	ug/Kg (ppb)
Lab Code:	K9705238-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	23	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	13	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	10	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	9	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	9	
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	66	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	17	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	83	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	111	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	58	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	67	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	102	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	110	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	176	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	143	69
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	26	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	142	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-08	Units:	ug/Kg (ppb)
Lab Code:	K9705238-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	2	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	3	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	2	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	0.9	J
[illegible]rene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	14	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	6	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	23	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	26	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	14	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	17	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	25	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	25	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	36	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	33	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	8	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	33	

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Approved By: [signature] Date: 9-2-97

1S22/022897a

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-07	Units:	ug/Kg (ppb)
Lab Code:	K9705238-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	8	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	6	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	5	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	6	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
[illegible]orene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	6	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	38	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	11	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	73	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	67	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	42	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	49	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	84	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	79	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	109	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	97	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	22	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	91	

Approved By: [signature] Date: 9-2-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-01	Units:	ug/Kg (ppb)
Lab Code:	K9705238-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	1	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	1	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	2	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	1	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
[illegible]orene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	0.7	J
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	5	J
[illegible]anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	1	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	10	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	9	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	4	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	5	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	7	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	7	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	9	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	8	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	9	

Approved By: _____ Date: 9-2-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-009	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	1	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	1	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.9	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
[illegible]rene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	4	J
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	1	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	4	J
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	5	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	3	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	3	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	7	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	6	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	11	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	12	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	3	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	12	

Approved By: [signature] Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-03	Units:	ug/Kg (ppb)
Lab Code:	K9705238-010	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	2	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	3	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	0.5	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
[illegible]rene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	0.9	J
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	5	J
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	1	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	7	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	8	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	4	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	5	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	8	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	7	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	9	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	11	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	5	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	12	

Approved By: [signature] Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-12	Units:	ug/Kg (ppb)
Lab Code:	K9705238-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	35	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	22	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	13	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	18	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	6	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	15	
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	136	
..nracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	31	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	131	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	178	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	69	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	93	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	113	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	116	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	192	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	158	69
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	23	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	159	

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Approved By: DVA Date: 9-2-97

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1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-16	Units:	ug/Kg (ppb)
Lab Code:	K9705238-012	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	22	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	12	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	95	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	30	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	4	J
[illegible]rene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	29	
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	460	
[illegible]thracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	135	
Fluoranthene	EPA 3545	SIM	50	0.6	10	8/11/97	8/20/97	1300	
Pyrene	EPA 3545	SIM	50	0.8	10	8/11/97	8/20/97	1600	
Benz(a)anthracene	EPA 3545	SIM	50	0.7	10	8/11/97	8/20/97	740	
Chrysene	EPA 3545	SIM	50	0.6	10	8/11/97	8/20/97	930	
Benzo(b)fluoranthene	EPA 3545	SIM	50	0.8	10	8/11/97	8/20/97	490	
Benzo(k)fluoranthene	EPA 3545	SIM	50	0.6	10	8/11/97	8/20/97	610	
Benzo(a)pyrene	EPA 3545	SIM	50	0.5	10	8/11/97	8/20/97	990	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	50	0.7	10	8/11/97	8/20/97	660	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	173	
Benzo(g,h,i)perylene	EPA 3545	SIM	50	0.4	10	8/11/97	8/20/97	660	

Approved By: _____ Date: 9-2-97 00078

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-11A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-013	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	221	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	130	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	62	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	122	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	33	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	105	
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	684	
racene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	160	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	673	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	789	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	373	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	452	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	517	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	544	
Benzo(a)pyrene	EPA 3545	SIM	50	0.5	10	8/11/97	8/20/97	530	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	802	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	142	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	832	

Approved By: DMA Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-25A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-015	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	64	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	44	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	25	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	129	63
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	59	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	102	64
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	356	320
.racene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	64	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	324	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	313	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	92	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	105	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	116	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	117	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	162	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	125	67
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	22	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	131	

Approved By: RB Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-02A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-017	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	4	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	4	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	5	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	3	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	3	J
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	20	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	6	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	71	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	96	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	44	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	52	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	59	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	63	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	103	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	76	69
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	13	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	77	

Approved By: DNA Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-02B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-018	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	1	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	0.7	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.9	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	4	J
nracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	1	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	4	J
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	5	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	2	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	2	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	3	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	3	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	5	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	6	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	6	

Approved By: RWA Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-04A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-019	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	31	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	27	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	11	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	16	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	8	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	19	
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	96	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	27	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	158	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	198	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	86	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	112	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	81	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	79	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	123	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	108	59
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	19	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	115	

Approved By: DM Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-04B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-020	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	24	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	12	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	7	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	4	J
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	10	
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	65	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	18	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	83	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	101	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	32	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	43	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	27	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	27	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	40	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	36	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	6	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	39	

Approved By: DNS Date: 9-2-97

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1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-05A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-022	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	3	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	1	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
[illegible]orene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
[illegible]anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	10	
[illegible]thracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	2	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	10	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	12	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	3	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	5	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	4	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	3	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	4	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	5	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	5	J

Approved By: [signature] Date: 9-2-97

1S22/022897a

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-05B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-023	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	0.6	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	0.3	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.5	J
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.8	J
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	3	J
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	1	J
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	2	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	1	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	1	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	2	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	1	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	2	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	2	J

Approved By: _____ Date: 9-2-97

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IS22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-06A	Units:	ug/Kg (ppb)
Lab Code:	K9705238-024	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	1	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	0.6	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.7	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.7	J
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	3	J
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	0.6	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	3	J
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	5	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	2	J
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	2	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	2	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	2	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	3	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.9	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	3	J

Approved By: RM Date: 9-2-97 00087

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-06B	Units:	ug/Kg (ppb)
Lab Code:	K9705238-025	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	2	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	1	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	1	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.7	J
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	2	J
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	2	J
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	3	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	0.7	J
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	0.9	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	0.7	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.9	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	1	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.8	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	1	J

Approved By: _____ Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702193-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	0.7	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/19/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Phenanthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	ND	
Anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/19/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/19/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/19/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/19/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/19/97	ND	

Approved By: _____ Date: 9-2-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702194-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	0.6	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	1	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	8/11/97	8/18/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	0.8	J
anthracene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	8/11/97	8/18/97	2	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	8/11/97	8/18/97	1	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	1	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	8/11/97	8/18/97	3	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	8/11/97	8/18/97	2	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	8/11/97	8/18/97	4	J

Approved By: _____ Date: 9-2-97

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APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deeping/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97

Duplicate Summary

Total Solids

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	160.3M	Basis:	NA
Test Notes:			

Sample Name	Lab Code	Date Analyzed	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
WR-BC-03	K9705238-010DUP	7/28/97	66.6	66.7	66.7	<1	

Approved By: _____ Date: 7/30/97

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TSDup/021397a

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: NA
Date Analyzed: 8/6/97

Duplicate Summary
Sulfide, Acid-Volatile

Sample Name: WR-BC-03
Lab Code: K9705238-010DUP
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.8	ND	ND	ND	-	

Approved By: _____ Date: 9/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	NA
		Date Analyzed:	8/6/97

Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name:	WR-BC-03	Units:	mg/Kg (ppm)
Lab Code:	K9705238-010MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.8	510	ND	440	86	75-125	

Approved By: _____ Date: 9/8/97

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MS/020597p
05238WET.LJ1 - MS 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: NA
Date Analyzed: 8/6/97

Duplicate Summary
Carbon, Total Organic

Sample Name: WR-BC-20
Lab Code: K9705238-001DUP
Test Notes:

Units: PERCENT
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	0.38	0.33	0.35	15	

Approved By: _____ Date: 9/8/97

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DUP/020597p
05238WET.LJ2 - DUP 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	NA
		Date Analyzed:	8/6/97

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	WR-BC-20	Units:	PERCENT
Lab Code:	K9705238-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	1.55	0.38	1.83	94	75-125	

Approved By: _____ Date: 9/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Duplicate Summary
Total Metals

Sample Name: WR-BC-03
Lab Code: K9705238-010D
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Arsenic	3050A	200.8	0.5	2.7	1.2	2.0	75	
Cadmium	3050A	200.8	0.02	0.33	0.31	0.32	6	
Chromium	3050A	200.8	0.5	17.8	19.2	18.5	8	
Copper	3050A	200.8	0.1	16.3	17.0	16.6	4	
Lead	3050A	200.8	0.02	10.5	10.1	10.3	4	
Mercury	7471A	7471A	0.05	0.03	0.03	0.03	<1	J
Nickel	3050A	200.8	0.5	16.7	16.6	16.6	1	
Silver	3050A	200.8	0.02	0.11	0.10	0.10	10	
Zinc	3050A	200.8	0.5	89.5	90.1	89.8	1	

Approved By: _____ Date: 9/8/97

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DUP/031695

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052381CP.JC1 - DUP 9/4/97

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: NA
Date Received: NA
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Duplicate Summary
Total Metals

Sample Name: Batch QC
Lab Code: K9705278-001D
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Arsenic	3050A	200.8	0.5	2.1	2.8	2.4	29	
Cadmium	3050A	200.8	0.02	0.30	0.25	0.28	18	
Chromium	3050A	200.8	0.5	26.2	24.2	25.2	8	
Copper	3050A	200.8	0.1	27.7	27.0	27.4	3	
Lead	3050A	200.8	0.02	32.2	27.6	27.1	17	
Mercury	7471A	7471A	0.05	0.09	0.11	0.010	20	
Nickel	3050A	200.8	0.5	20.0	18.7	19.4	7	
Silver	3050A	200.8	0.02	0.27	0.19	0.23	35	
Zinc	3050A	200.8	0.5	171	168	170	3	

Approved By: _____ Date: 9/04.7

DUP/031695

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Matrix Spike Summary
Total Metals

Sample Name: WR-BC-03
Lab Code: K9705238-010MS
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic	3050A	200.8	0.5	15	2.7	16.2	90	75-125	
Cadmium	3050A	200.8	0.02	3.8	0.33	3.53	84	75-125	
Chromium	3050A	200.8	0.5	15	17.8	31.9	94	75-125	
Copper	3050A	200.8	0.1	19	16.3	31.0	77	75-125	
Lead	3050A	200.8	0.02	38	10.5	49.4	102	75-125	
Mercury	7471A	7471A	0.05	0.4	0.03	0.44	102	75-125	
Nickel	3050A	200.8	0.5	38	16.7	47.9	82	75-125	
Silver	3050A	200.8	0.02	3.8	0.11	3.26	83	75-125	
Zinc	3050A	200.8	0.5	38	89.5	123	88	75-125	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/J5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/30/97
		Date Analyzed:	7/31/97

Matrix Spike Summary
Total Metals

Sample Name:	Batch QC	Units:	mg/Kg (ppm)
Lab Code:	K9705278-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic	3050A	200.8	0.5	17	2.1	16.3	84	75-125	
Cadmium	3050A	200.8	0.02	4.2	0.30	3.90	86	75-125	
Chromium	3050A	200.8	0.5	17	26.2	40.5	84	75-125	
Copper	3050A	200.8	0.1	21	27.7	49.0	101	75-125	
Lead	3050A	200.8	0.02	42	32.2	73.3	98	75-125	
Mercury	7471A	7471A	0.05	0.47	0.09	0.55	98	75-125	
Nickel	3050A	200.8	0.5	42	20.0	54.3	82	75-125	
Silver	3050A	200.8	0.02	4.2	0.27	3.80	84	75-125	
Zinc	3050A	200.8	0.5	42	171	204	79	75-125	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
LCS Matrix: Sediment

Service Request: K9705238
Date Collected: NA
Date Received: NA
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Laboratory Control Sample Summary #1
Total Metals

Sample Name: Laboratory Control Sample
Lab Code: K9705238-LCS
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Source: Environmental Resource Associates

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Control Limits	Result Notes
Arsenic	3050A	200.8	62.7	60.4	96	70-130	
Cadmium	3050A	200.8	77.4	72.3	93	66-133	
Chromium	3050A	200.8	76.9	72.0	94	77-123	
Copper	3050A	200.8	58.2	54.4	93	79-121	
Lead	3050A	200.8	122	119	98	68-131	
Mercury	7471A	7471A	2.51	2.46	98	64-136	
Nickel	3050A	200.8	163	155	95	75-125	
Silver	3050A	200.8	69.6	71.8	103	74-126	
Zinc	3050A	200.8	114	111	97	74-126	

Approved By: _____ Date: 9/9/97

00101

LCS/032295
05238ICP JC1 - LCSS 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/J5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/30/97
		Date Analyzed:	7/31/97

Laboratory Control Sample Summary #2
Total Metals

Sample Name:	Laboratory Control Sample	Units:	mg/Kg (ppm)
Lab Code:	K9705238-LCS	Basis:	Dry
Test Notes:			

Source: Environmental Resource Associates

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Control Limits	Result Notes
Arsenic	3050A	200.8	62.7	59.1	94	70-130	
Cadmium	3050A	200.8	77.4	70.2	91	66-133	
Chromium	3050A	200.8	76.9	81.6	106	77-123	
Copper	3050A	200.8	58.2	55.0	95	79-121	
Lead	3050A	200.8	122	120	98	68-131	
Mercury	7471A	7471A	2.51	2.31	92	64-136	
Nickel	3050A	200.8	163	155	95	75-125	
Silver	3050A	200.8	69.6	69.1	99	74-126	
Zinc	3050A	200.8	114	113	99	74-126	

Approved By: _____ Date: 9/9/97

00102

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 7/29/97
Date Analyzed: 8/5-6/97

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Prep Method: EPA 3550A
Analysis Method: 8080A

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tetrachloro-m-xylene	Percent Recovery Decachlorobiphenyl
WR-BC-20	K9705238-001		48	50
WR-BC-15	K9705238-002		38	34
WR-BC-10	K9705238-003		58	49
WR-B	K9705238-004		57	47
WR-BC-09	K9705238-005		54	46
WR-BC-08	K9705238-006		59	55
WR-BC-07	K9705238-007		60	50
WR-BC-01	K9705238-008		71	86
WR-A	K9705238-009		49	47
/R-BC-03	K9705238-010		57	61
WR-BC-12	K9705238-011		54	51
WR-BC-16	K9705238-012		54	55
WR-GC-11A	K9705238-013		49	34
WR-GC-25A	K9705238-015		56	41
WR-GC-02A	K9705238-017		61	39
WR-GC-02B	K9705238-018		68	51
WR-GC-04A	K9705238-019		64	40
WR-GC-04B	K9705238-020		56	43
WR-GC-05A	K9705238-022		64	34
WR-GC-05B	K9705238-023		56	47
WR-BC-01	K9705238-008MS		65	83
WR-BC-01	K9705238-008DMS		60	72
Lab Control Sample	K970729-SL		76	87
Method Blank	K970729-SB		69	86
CAS Acceptance Limits:			20-107	20-142

Approved By: _____ Date: 8/13/97

00103

SUR2/052595
05238SVG JS5 - SUR2 8/12/97

Page No.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-01	Units:	ug/Kg (ppb)
Lab Code:	K9705238-008MS, K9705238-008DMS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	2	13	13	ND	11	9	85	69	20-141	20	
Heptachlor	EPA 3550A	8080A	2	13	13	ND	10	9	77	69	20-108	11	
Aldrin	EPA 3550A	8080A	2	13	13	ND	10	8	77	62	20-181	22	
Dieldrin	EPA 3550A	8080A	2	13	13	ND	11	9	85	69	20-183	20	
Endrin	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-164	10	
4,4'-DDT	EPA 3550A	8080A	2	13	13	ND	11	9	85	69	20-185	20	

Approved By: [signature] Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	K970729-SL	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	13	12	92	21-123	
Heptachlor	EPA 3550A	8080A	13	12	92	31-112	
Aldrin	EPA 3550A	8080A	13	11	85	26-127	
Dieldrin	EPA 3550A	8080A	13	12	92	20-161	
Endrin	EPA 3550A	8080A	13	12	92	32-135	
4,4'-DDT	EPA 3550A	8080A	13	12	92	30-146	

Approved By: _____ Date: 8/13/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	7/29/97
		Date Analyzed:	8/7-14/97

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Prep Method:	EPA 3550A	Units:	PERCENT
Analysis Method:	8080A	Basis:	NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tetrachloro-m-xylene	Percent Recovery Decachlorobiphenyl
WR-GC-06A	K9705238-024		23	37
WR-GC-06B	K9705238-025		22	67
Batch QC	K9705215-009		51	64
Batch QC	K9705215-009MS		66	73
Batch QC	K9705215-009DMS		65	70
Lab Control Sample	K970729-LCS		57	69
Method Blank	K970729-MB		63	78

CAS Acceptance Limits:	20-107	20-142

Approved By: Jay Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/8/97

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Batch QC	Units:	ug/Kg (ppb)
Lab Code:	K9705215-009MS, K9705215-009DMS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-141	10	
Heptachlor	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-108	10	
Aldrin	EPA 3550A	8080A	2	13	13	ND	9	9	69	69	20-181	<1	
Dieldrin	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-183	10	
Endrin	EPA 3550A	8080A	2	13	13	ND	11	10	85	77	20-164	10	
4,4'-DDT	EPA 3550A	8080A	2	13	13	ND	10	9	77	69	20-185	11	

Approved By: _____ Date: 8-20-97

00107

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
LCS Matrix: Sediment

Service Request: K9705238
Date Collected: NA
Date Received: NA
Date Extracted: 7/29/97
Date Analyzed: 8/7/97

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: Lab Control Sample
Lab Code: K970729-LCS
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	13	9	69	21-123	
Heptachlor	EPA 3550A	8080A	13	9	69	31-112	
Aldrin	EPA 3550A	8080A	13	8	62	26-127	
Dieldrin	EPA 3550A	8080A	13	10	77	20-161	
Endrin	EPA 3550A	8080A	13	10	77	32-135	
4,4'-DDT	EPA 3550A	8080A	13	10	77	30-146	

Approved By: JWS Date: 8-20-97 00108

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 8/6/97
Date Analyzed: 8/9/97

Surrogate Recovery Summary
Butyltins

Prep Method: METHOD
Analysis Method: Butyltins-GC

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tri-n-propyltin	Percent Recovery Tri-n-pentyltin
WR-BC-20	K9705238-001		51	62
WR-BC-15	K9705238-002		61	75
WR-BC-10	K9705238-003		69	81
WR-B	K9705238-004		55	70
WR-BC-09	K9705238-005		66	78
WR-BC-08	K9705238-006		66	81
WR-BC-07	K9705238-007		72	84
WR-BC-01	K9705238-008		93	112
WR-A	K9705238-009		74	103
WR-BC-03	K9705238-010		64	82
WR-BC-12	K9705238-011		87	113
WR-BC-16	K9705238-012		84	102
WR-B	K9705238-004MS		52	81
WR-B	K9705238-004DMS		80	110
Lab Control Sample	K970806-WL		70	82
Method Blank	K970806-WB		68	82
CAS Acceptance Limits:			20-113	20-133

Approved By: Jay Date: 8-12-97

00109

SUR2/052595
05238SVG JS2 - SUR 8/12/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	8/6/97
		Date Analyzed:	8/9/97

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins

Sample Name:	WR-B	Units:	ug/L (ppb)
Lab Code:	K9705238-004MS, K9705238-004DMS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	2.3	2.3	0.1	1.5	2.0	61	83	20-127	33	

Approved By: Jus Date: 8-12-97

00110

DMS/052595

05238SVG JS2 - 4DMS 8/12/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/6/97
		Date Analyzed:	8/9/97

Laboratory Control Sample Summary
Butyltins

Sample Name:	Lab Control Sample	Units:	ug/L (ppb)
Lab Code:	K970806-WL	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.50	0.36	72	20-138	

Approved By: Jus Date: 8-12-97

00111

LCS/52595
05238SVG JS2 - LCS 8/12/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 8/11/97
Date Analyzed: 8/18 - 8/19/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-BC-20	K9705238-001		66	81	65
WR-BC-15	K9705238-002		49	66	54
WR-BC-10	K9705238-003		24	35	43
WR-B	K9705238-004		20	28	30
WR-BC-09	K9705238-005		22	32	39
WR-BC-08	K9705238-006		14	18	18
WR-BC-07	K9705238-007		49	65	59
WR-BC-01	K9705238-008		43	57	58
WR-[illegible]	K9705238-009		25	32	45
[illegible] 03	K9705238-010		42	61	67
WR-BC-12	K9705238-011		44	56	49
WR-BC-16	K9705238-012		40	47	53
WR-GC-11A	K9705238-013		39	45	54
WR-GC-25A	K9705238-015		47	48	56
WR-GC-02A	K9705238-017		43	51	49
WR-GC-02B	K9705238-018		26	32	46
WR-GC-04A	K9705238-019		41	44	45
WR-GC-04B	K9705238-020		27	32	33
WR-GC-05A	K9705238-022		42	39	48
WR-GC-05B	K9705238-023		32	43	40
Method Blank	KWG9702194-4		34	37	44
WR-BC-03	K9705238-010MS		25	37	40
WR-BC-03	K9705238-010DMS		38	45	47
Lab Control Sample	KWG9702194-3		28	41	41
	CAS Acceptance Limits:		13-142	13-142	15-145

Approved By: _____ Date: 9-2-97

00112

SUR3/050897a
05238SVM WN3 - SUR 8/23/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705238
Date Collected: 7/24/97
Date Received: 7/24/97
Date Extracted: 8/11/97
Date Analyzed: 8/19/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-GC-06A	K9705238-024		68	74	74
WR-GC-06B	K9705238-025		50	71	71
Batch QC	K9705604-001		NA AZ	NA AZ	55
Batch QC	K9705604-001MS		NA AZ	NA AZ	47
Batch QC	K9705604-001DMS		NA AZ	NA AZ	39
Lab Control Sample	KWG9702193-3		49	61	63
Method Blank	KWG9702193-4		58	66	68
CAS Acceptance Limits:			13-142	13-142	15-145

Approved By: _____ Date: 9/9/97

00113

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/24/97
		Date Extracted:	8/11/97
		Date Analyzed:	8/18/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-03		Units:	ug/Kg (ppb)
Lab Code:	K9705238-010MS	K9705238-010DMS	Basis:	Dry
Test Notes:				

				Spike Level		Sample	Spike Result		Percent Recovery				
Analyte	**Prep Method**	**Analysis Method**	**MRL**	**MS**	**DMS**	**Result**	**MS**	**DMS**	**MS**	**DMS**	**CAS Acceptance Limits**	**Relative Percent Difference**	**Result Notes**
Acenaphthene	EPA 3545	SIM	5	320	370	ND	101	179	32	48	12-133	40	
Pyrene	EPA 3545	SIM	5	320	370	8	170	231	51	60	10-160	16	
Benzo(a)pyrene	EPA 3545	SIM	5	320	370	9	336	445	102	118	10-160	15	

Approved By: DA Date: 9-2-97

00114

DMS/031497a
05238SVM WN3 - DMS 8/23/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/11/97
		Date Analyzed:	8/19/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC		Units:	ug/Kg (ppb)
Lab Code:	K9705604-001MS	K9705604-001DMS	Basis:	Dry
Test Notes:				

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Acenaphthene	EPA 3545	SIM	5	140	140	ND	ND	ND	NC	NC	12-133	-	
Pyrene	EPA 3545	SIM	5	140	140	139	167	162	20	16	10-160	3	
Benzo(a)pyrene	EPA 3545	SIM	5	140	140	5	97	103	66	70	10-160	6	

Approved By: _____ Date: 9/8/97

00115

DMS/031497a

05238SVM.WN4 - DMS 9/4/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/11/97
		Date Analyzed:	8/18/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	KWG9702194-3	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	27	33	36-119	EU
Pyrene	EPA 3545	SIM	83	39	47	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	70	84	24-137	

Approved By: _____ Date: 9-2-97

LCS/031497a
05238SVM WN3 - LCS 8/23/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705238
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/11/97
		Date Analyzed:	8/19/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	KWG9702193-3	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	40	48	36-119	
Pyrene	EPA 3545	SIM	83	54	65	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	55	66	24-137	

Approved By: DM Date: 9-2-97

APPENDIX B

CHAIN OF CUSTODY INFORMATION

K9705238

Sample Custody Record

DATE 7.24.97 PAGE 1 OF 1

HARTCROWSER

Hart Crowser, Inc.
Five Centerpointe Drive, Suite 240
Lake Oswego, Oregon 97035

JOB NUMBER 5672 LAB NUMBER

PROJECT MANAGER TAKU FUJI

PROJECT NAME PORT OF PORTLAND
WILLAMETTE RV. SAMPLING

SAMPLED BY: RRS, JPF

LAB NO.	SAMPLE	TIME	STATION	MATRIX	PEST/PCB	METALS	VOLATILES	TBT PORE WATER						NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	WR-BC-20	0902	K5238-1	SEDIMENT	1	2	2	4						9	Recd 8 BHs.
	WR-BC-15	0945	2		1	2	2	4						9	
	WR-BC-10	1015	3		1	2	2	4						9	
	WR-B	1015	4		1	2	2	4						9	
	WR-BC-09	1100	5		1	2	2	4						9	
	WR-BC-08	1128	6		1	2	2	3						8	Recd 9 BHs
	WR-BC-07	1203	7		1	2	2	4						9	
	WR-BC-01	1330	8		1	2	2	4						9	
	WR-A	1330	9		1	2	2	4						9	
	WR-BC-03	1404	10		1	2	2	5						10	MS/MSD
	WR-BC-12	1446, 1504, 1527	11		1	2	2	4						9	COMPOSITE OF WR-BC-12, 13 & 14
	WR-BC-16	1610, 1645	12		1	2	2	5						10	COMPOSITE OF WR-BC-16 & 17 + MS/MSD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Ryan Seelbach	7.24.97	SIGNATURE: [illegible]	7/24/97
PRINTED NAME: RYAN SEELBACH	TIME	PRINTED NAME: Grant W. Kruckel	TIME
COMPANY: HART CROWSER	1805	COMPANY: Hart Crowser, Inc.	1805

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: [illegible]	7/24/97	SIGNATURE: [illegible]	7/25/97
PRINTED NAME: Grant W. Kruckel	TIME	PRINTED NAME: [illegible]	TIME
COMPANY: Hart Crowser, Inc.	1930 0830	COMPANY: HCS	730

TOTAL NUMBER OF CONTAINERS 109

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS 4°C

DISTRIBUTION:

1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/24/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fuji

COMPANY/ADDRESS Hart Crowser, Inc.
1910 Fairview Ave. E., Seattle, WA 98102

PHONE 206 324-9530

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX Gas ☐ BTEX ☐ 5030/8015/8020	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐ Semi Pest/ VOA ☐ Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-11 A	7/24/97	PM	5238-13	Sediment	5		/		/						/							
WR-GC-11Z			14		1																	
WR-GC-25A			15		5		/		/						/							
WR-GC-25Z			16		1																	

RELINQUISHED BY:
Signature
Grant W. Fuchtel
Printed Name
Hart Crowser, Inc.
Firm
7/24/97 1930
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
7/25/97 730
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: ___

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/24/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fuji

COMPANY/ADDRESS Hart Crowser, Inc.
1910 Fairview Ave. E., Seattle, WA 98102

PHONE 206 324-9530

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA/418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX 5030/8015/8020 Gas ☐ BTEX ☐	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐ Semi Pest/ VOA ☐ Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-02A	7/24/97	AM	S28-17	Sediment	5		✓		✓						✓							
WR-GC-02B			18		5		✓		✓						✓							
WR-GC-04A			19		5		✓		✓						✓							
WR-GC-04B			20		5		✓		✓						✓							
WR-GC-04Z			21		1																	
WR-GC-05A			22		5		✓		✓						✓							
WR-GC-05B			23		5		✓		✓						✓							
WR-GC-06A		PM	24		5		✓		✓						✓							
WR-GC-06B			25		5		✓		✓						✓							
WR-GC-06Z			26		1																	

RELINQUISHED BY:
Signature
Grant W. Fuechtel
Printed Name
Hart Crowser, Inc.
Firm
7/24/97 1930
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
7/25/97 730
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: ___

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client Hart Crowser/Channel Deepening Work Order K97 9.

Cooler received on 7/25 and opened on 7/25 by Jenne S.

1. Were custody seals on outside of cooler? YES NO
   If yes, how many and where? 1 top front
2. Were signature & date correct? YES NO
3. Were custody papers properly filled out (ink, signed, etc)? YES NO
4. Did all bottles arrive in good condition (unbroken)? YES NO
5. Were all bottle labels complete (*i.e.* analysis, preservation, etc)? YES NO
6. Did all bottle labels and tags agree with custody papers? YES NO
7. Were correct bottles used for the tests indicated? YES NO
8. Were VOA vials checked for absence of air bubbles, and noted if so? YES NO
9. Did the bottles originate from CAS/Kelso or a branch laboratory? YES NO
10. Chain-of-custody identification number:

Temperature of cooler(s) upon receipt:	5.9°	4.7°	7.9°	9.1°	10.3°	6.7° 13.:
Temperature Blank:						
Is the temperature within 4 ± 2° C?:	✓	Yes ☑	Yes ☐	Yes ☐	Yes ☐	Yes ☐
		No ☐	No ☑	No ☑	No ☑	No ☑ ✓

Explain any discrepancies

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					

YES = All samples OK
NO = Samples were preserved at lab as listed

VOC Vial pH Verification (Tested after Analysis) ☐ All Samples pH ≤ 2 ☐ Following Samples Exhibited pH > 2			Samples received outside of temperature range	Sample I.D.
			WR-BC-03, 12, 20	
			WR-A	
			WR BC 07, 01, 08	
			10 09 06A, 06B	
			15 16 WR-B	

00122

Columbia Analytical Services, Inc.

EPA Method 160.3 - Total Solids

Workgroup: KWG9702004

Analyst: AMILLER

Date Acquired: 28 Jul 97 11:16 AM

Date Completed: 30 Jul 97 12:12 PM

Oven Temp: 105

Reviewed By: [illegible]

Date Reviewed: 7/30/97

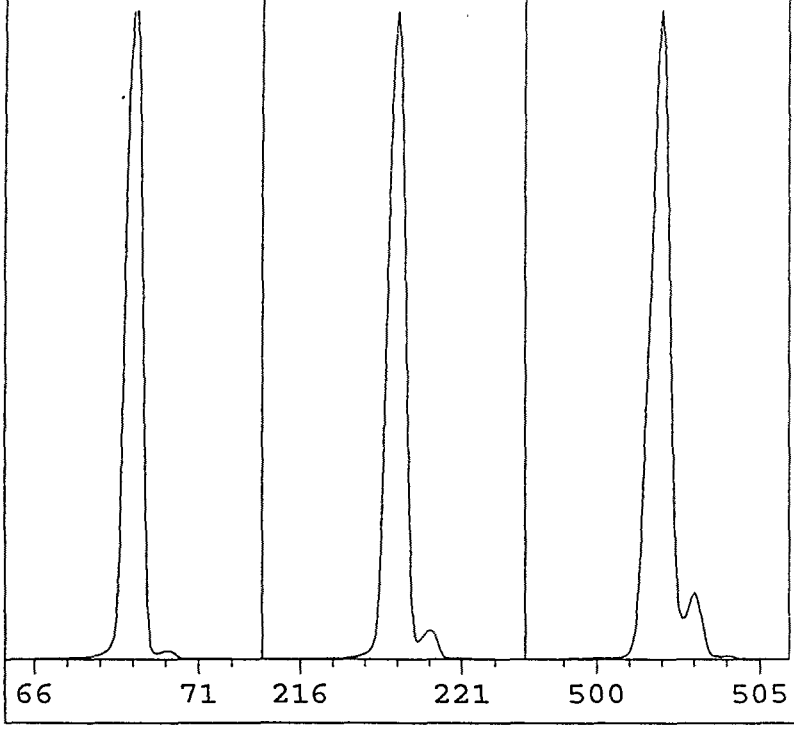
#	Labcode	Tare	Wet Wt	Tare+Dry	Dry Wt	% Solids	Description	Matrix	Sample Name	QC Ref Sample
1	K9705238-001	1.31	10.79	9.15	7.84	72.7		SEDIMEN	WR-BC-20	
2	K9705238-002	1.29	13.93	7.73	6.44	46.2		SEDIMEN	WR-BC-15	
3	K9705238-003	1.31	15.21	8.47	7.16	47.1		SEDIMEN	WR-BC-10	
4	K9705238-004	1.31	13.51	7.91	6.60	48.9		SEDIMEN	WR-B	
5	K9705238-005	1.31	17.11	10.53	9.22	53.9		SEDIMEN	WR-BC-09	
6	K9705238-006	1.31	16.25	10.12	8.81	54.2		SEDIMEN	WR-BC-08	
7	K9705238-007	1.30	15.23	9.15	7.85	51.5		SEDIMEN	WR-BC-07	
8	K9705238-008	1.31	15.05	12.62	11.31	75.1		SEDIMEN	WR-BC-01	
9	K9705238-009	1.31	13.58	11.22	9.91	73.0		SEDIMEN	WR-A	
10	K9705238-010	1.33	16.31	12.20	10.87	66.6		SEDIMEN	WR-BC-03	
11	K9705238-011	1.30	12.46	10.03	8.73	70.1		SEDIMEN	WR-BC-12	
12	K9705238-012	1.31	15.12	10.06	8.75	57.9		SEDIMEN	WR-BC-16	
13	K9705238-013	1.32	15.29	9.76	8.44	55.2		SEDIMEN	WR-GC-11A	
14	K9705238-015	1.32	13.81	8.89	7.57	54.8		SEDIMEN	WR-GC-25A	
15	K9705238-017	1.31	20.57	15.52	14.21	69.1		SEDIMEN	WR-GC-02A	
16	K9705238-018	1.30	11.49	10.15	8.85	77.0		SEDIMEN	WR-GC-02B	
17	K9705238-019	1.32	19.18	13.54	12.22	63.7		SEDIMEN	WR-GC-04A	
18	K9705238-020	1.31	12.91	9.35	8.04	62.3		SEDIMEN	WR-GC-04B	
19	K9705238-022	1.33	10.15	8.10	6.77	66.7		SEDIMEN	WR-GC-05A	
20	K9705238-024	1.32	13.46	10.55	9.23	68.6		SEDIMEN	WR-GC-05B	
21	K9705238-024	1.31	15.12	9.63	8.32	55.0		SEDIMEN	WR-GC-06A	
22	K9705238-025	1.31	10.95	7.16	5.85	53.4		SEDIMEN	WR-GC-06B	
23	KWG9702004-1	1.31	13.71	10.45	9.14	66.7		SEDIMEN	Duplicate Client Sam	K9705238-010

239 of 253
001123

HP5972

Tue Aug 19 07:11:25 1997 J:\MS07\TUNES\SIM.U

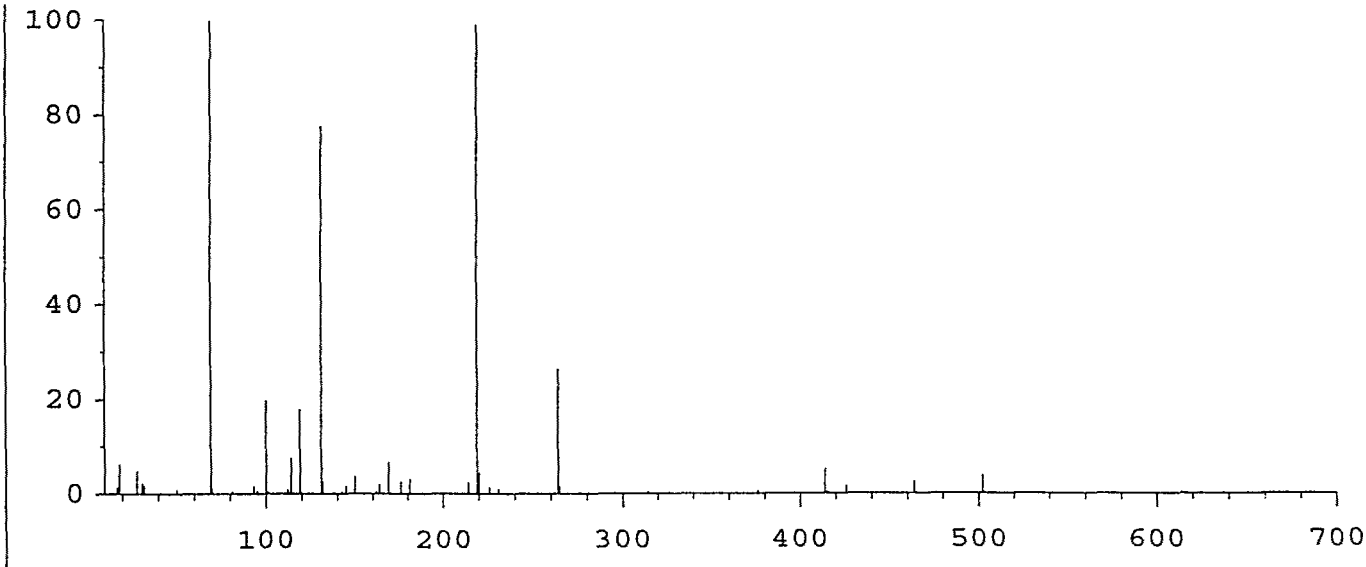
Mass	69.10	Mass	218.95	Mass	502.00
Ab	1659152	Ab	1631319	Ab	67022
Pw50	0.56	Pw50	0.60	Pw50	0.65



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	186	TTI	OFF
Vacuum	39	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
348 peaks Base: 69.00 Abundance: 1628672



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	1628672	100.00	69.90	20544	1.26
218.90	1617920	99.34	219.90	75256	4.65
501.95	65688	4.03	502.95	6514	9.92

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	77.7	99.3	4.0

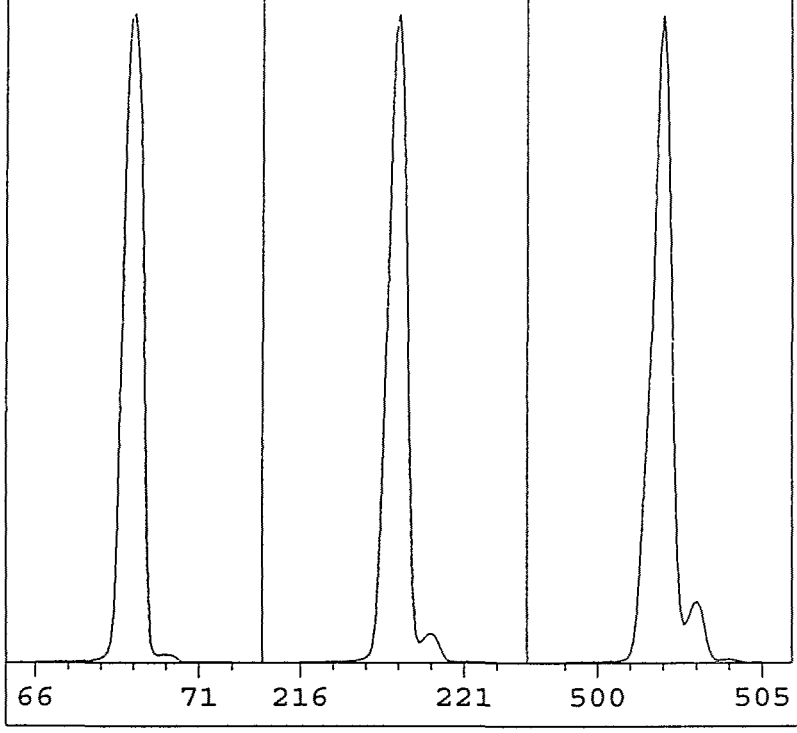
5/22/97

00124

HP5972

Tue Aug 19 07:12:13 1997 J:\MS07\TUNES\SIM.U

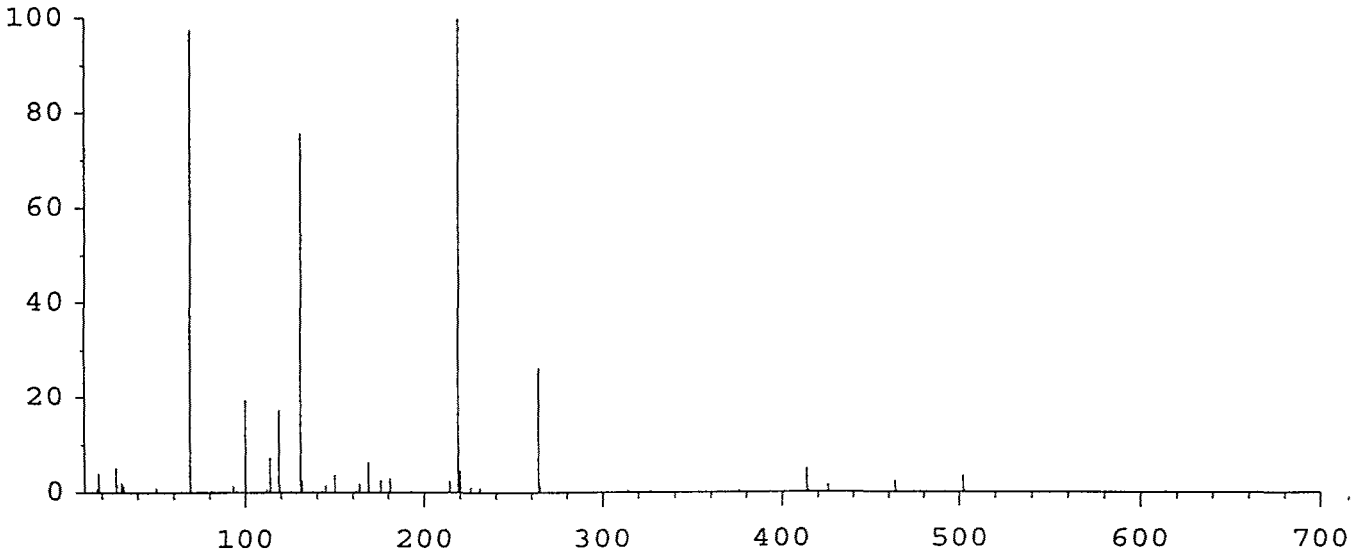
Mass	69.00	Mass	218.95	Mass	502.00
Ab	1342042	Ab	1354997	Ab	53782
Pw50	0.68	Pw50	0.63	Pw50	0.61



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	187	TTI	OFF
Vacuum	39	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
249 peaks Base: 218.90 Abundance: 1308672



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	1278976	100.00	0.00	0	0.00
218.90	1308672	102.32	219.90	60448	4.62
501.95	50496	3.95	502.95	5080	10.06

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	77.8	102.3	3.9

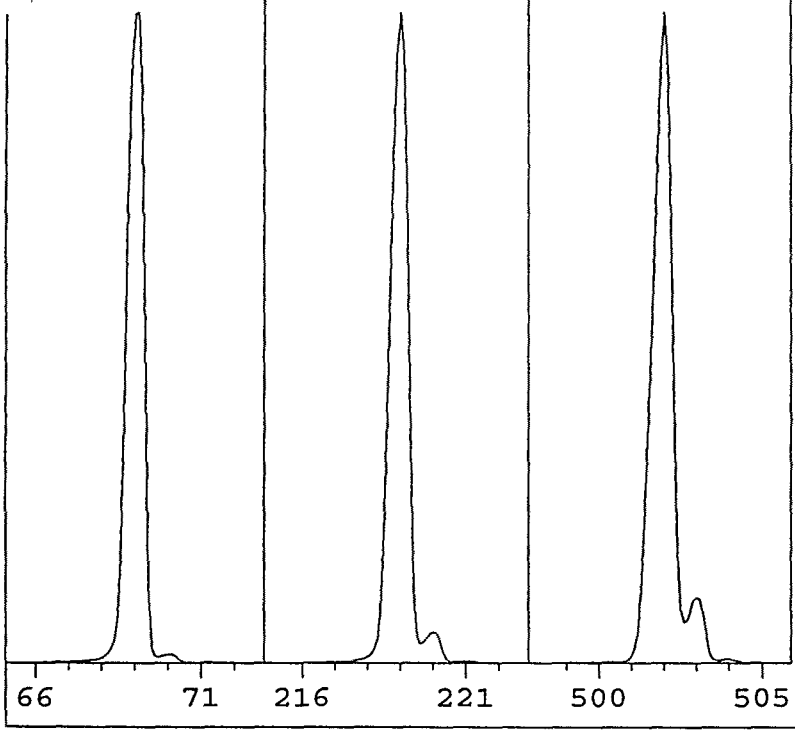
8/27/97

00125

HP5972

Wed Aug 20 08:05:19 1997 J:\MS07\TUNES\SIM.U

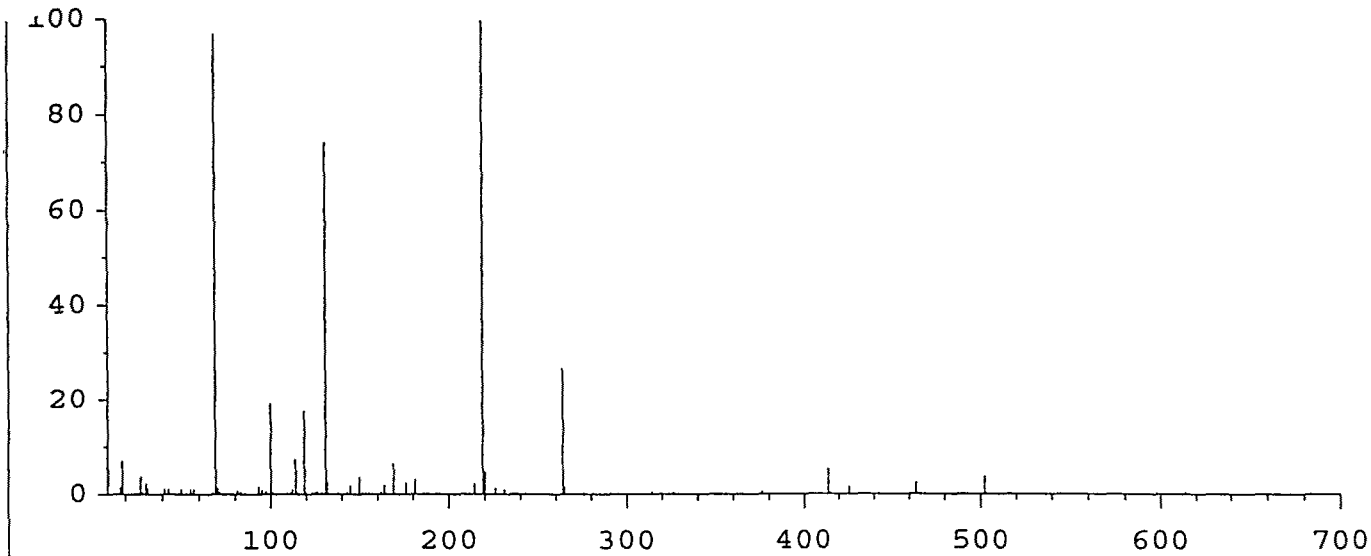
Mass	69.10	Mass	218.95	Mass	502.00
Ab	2200823	Ab	2191116	Ab	95296
Pw50	0.57	Pw50	0.60	Pw50	0.64



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	187	TTI	OFF
Vacuum	38	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
19 peaks Base: 218.90 Abundance: 2171904



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	2106880	100.00	70.00	31896	1.51
218.90	2171904	103.09	219.90	105520	4.86
501.95	86816	4.12	502.95	9169	10.56

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	76.5	103.1	4.1

8/23/97

00126

242

HEADER SHEET FOR SEDIMENT SAMPLING TRIP

PROJECT LOCATION: CRCD- Willamette River

SAMPLING DATE: 7/24/97

SAMPLING METHOD (PONAR/BOX CORE/GRAVITY CORE/VIBRA CORE):

SAMPLING ANALYSIS (SAMPLE NUMBERS ANALYZED)

GRAIN SIZE:

OIL/GREASE:

AMMONIA (NH4):

SULFIDE: WR-C; WR-BC- 21, 22, 23, 26, 29, 36

TOTAL ORGANIC CARBON (TOC): "

VOLATILE SOLIDS: SAME AS GRAIN SIZE

METALS: SAME AS SULFIDE

PESTICIDES: "

PAH'S: "

ELUTRIATES:

BIOLOGICAL:

SEDIMENT QUALITY dBASE FILES:

Rec'd
9/10/97

Chem Etd
9/12/97

Columbia
Analytical
Services inc.

September 3, 1997

Service Request No: K9705278

Mark Siipola
U.S. Army Corps of Engineers
333 SW First Avenue, Robert Duncan Plaza
Portland, OR 97204

Re: Channel Deepening/J5672

Dear Mark:

Enclosed are the results of the sample(s) submitted to our laboratory on July 25, 1997. For your reference, these analyses have been assigned our service request number K9705278.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Elizabeth Schneider
Project Chemist

ES/lj

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Hart Crowser, Inc.	**Service Request No.:**	K9705278
Project:	Channel Deepening/J5672	**Date Received:**	7/25/97
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier IIA data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

The 8080 Tetracholor-m-xylene surrogate recovery in the Method Blank (MB) was outside normal CAS control limits. All other QA/QC associated with the 8080 analysis of these samples was within normal CAS control limits, so no further corrective action was taken.

The Acenaphthene target analyte recovery in the SIM PAH LCS was slightly below normal CAS acceptance limits. Since the Acenaphthene recovery in the associated MS/DMS was within acceptance limits, no further corrective action was taken.

Approved by_____ Date 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Solids

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	160.3M	Basis:	NA
Test Notes:			

Sample Name	Lab Code	Date Analyzed	Result	Result Notes
WR-BC-36	K9705278-001	7/31/97	59.8	
WR-BC-29	K9705278-002	7/31/97	58.4	
WR-C	K9705278-003	7/31/97	59.5	
WR-BC-26	K9705278-004	7/31/97	70.6	
WR-BC-23	K9705278-005	7/31/97	77.8	
WR-BC-22	K9705278-006	7/31/97	82.2	
WR-BC-21	K9705278-007	7/31/97	76.6	

Approved By: UM Date: 8/5/97

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TSSample/021397a

0527818 AGI - Sample 8/1/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-C	Units:	mg/Kg (ppm)
Lab Code:	K9705278-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.17	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	27.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	27.6	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	17.5	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.06	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	21.2	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.19	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	107	

Approved By: S Date: 9/9/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-21	Units:	mg/Kg (ppm)
Lab Code:	K9705278-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.7	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.06	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	17.0	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	16.4	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	4.49	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.02	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	16.0	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	53.6	

Approved By: _____ Date: 9/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-22	Units:	mg/Kg (ppm)
Lab Code:	K9705278-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	3.3	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.05	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	14.5	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	12.2	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	4.73	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.01	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	14.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	45.2	

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Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-23	Units:	mg/Kg (ppm)
Lab Code:	K9705278-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	1.4	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.05	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	15.8	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	13.1	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	3.88	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	14.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	49.3	

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Approved By: _____ Date: 9/8/97

1S44mc/031695

05278ICP GJ1 - Sample (5) 9/3/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-26	Units:	mg/Kg (ppm)
Lab Code:	K9705278-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.1	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.08	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	17.7	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	16.4	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	5.88	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	16.1	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.08	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	51.5	

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Approved By: _____ Date: 9/3/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-29	Units:	mg/Kg (ppm)
Lab Code:	K9705278-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	3.9	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.17	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	25.0	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	26.9	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	16.8	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	20.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.18	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	110	

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Approved By: _____ Date: 9/9/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Total Metals

Sample Name:	WR-BC-36	Units:	mg/Kg (ppm)
Lab Code:	K9705278-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.1	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.30	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	26.2	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	27.7	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	32.2	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.09	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	20.0	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.27	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	171	

Approved By: S Date: 9/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Total Metals

Sample Name:	Method Blank	Units:	mg/Kg (ppm)
Lab Code:	K9705278-MB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	ND	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	ND	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	ND	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	ND	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	ND	

Approved By: _____ Date: 9/9/97

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1S44mc/031695

052781CP.GJ1 - Sample (8) 9/3/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-C	Units:	ug/L (ppb)
Lab Code:	K9705278-003	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	0.009	1	8/11/97	8/13/97	0.02	J

Approved By: MManthe Date: 8/18/97

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1S22/052595

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-BC-21	Units:	ug/L (ppb)
Lab Code:	K9705278-007	Basis:	NA
Test Notes:	DH		

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.20	0.036	1	8/11/97	8/13/97	0.25	

Approved By: MMarthe Date: 8/18/97

1S22/052595

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-BC-23	Units:	ug/L (ppb)
Lab Code:	K9705278-005	Basis:	NA
Test Notes:	DH		

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.15	0.027	1	8/11/97	8/13/97	0.42	

Approved By: MManthe Date: 8/18/97

1S22/052595

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-BC-26	Units:	ug/L (ppb)
Lab Code:	K9705278-004	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	0.009	I	8/11/97	8/13/97	0.01	J

Approved By: MManthe Date: 8/18/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-BC-29	Units:	ug/L (ppb)
Lab Code:	K9705278-002	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	0.009	1	8/11/97	8/13/97	0.02	J

Approved By: MManthe Date: 8/18/97

1S22/052595

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Butyltins in porewater

Sample Name:	WR-BC-36	Units:	ug/L (ppb)
Lab Code:	K9705278-001	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	0.009	1	8/11/97	8/13/97	ND	

Approved By: MMarthe Date: 8/18/97

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1S22/052595

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Butyltins in porewater

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	K970811-MB	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	0.009	1	8/11/97	8/13/97	ND	

Approved By: MManthe Date: 8/18/97

1S22/052595

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Carbon, Total Organic

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	ASTM D4129-82M	Basis:	Dry
Test Notes:			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-BC-36	K9705278-001	0.05	0.05	1	NA	8/8/97	1.43	
WR-BC-29	K9705278-002	0.05	0.05	1	NA	8/8/97	1.18	
WR-C	K9705278-003	0.05	0.05	1	NA	8/8/97	1.32	
WR-BC-26	K9705278-004	0.05	0.05	1	NA	8/8/97	0.18	
WR-BC-23	K9705278-005	0.05	0.05	1	NA	8/8/97	0.52	
WR-BC-22	K9705278-006	0.05	0.05	1	NA	8/8/97	0.77	
WR-BC-21	K9705278-007	0.05	0.05	1	NA	8/8/97	0.61	
Method Blank	K9705278-MB	0.05	0.05	1	NA	8/8/97	ND	

M Modified

Approved By: arp Date: 8/20/97

1A/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Sulfide, Acid-Volatile

Prep Method:	NONE	Units:	mg/Kg (ppm)
Analysis Method:	Draft Aug 91	Basis:	Dry
Test Notes:			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-BC-36	K9705278-001	0.9	0.4	1	NA	8/7/97	22	
WR-BC-29	K9705278-002	0.9	0.4	1	NA	8/7/97	11.4	
WR-C	K9705278-003	0.9	0.4	1	NA	8/7/97	1.5	
WR-BC-26	K9705278-004	0.8	0.4	1	NA	8/7/97	0.8	
WR-BC-23	K9705278-005	0.7	0.3	1	NA	8/7/97	ND	
WR-BC-22	K9705278-006	0.7	0.3	1	NA	8/7/97	3.6	
WR-BC-21	K9705278-007	0.7	0.3	1	NA	8/7/97	ND	
Method Blank	K9705278-MB	0.5	0.2	1	NA	8/7/97	ND	

Approved By: alp Date: 8/20/97

1A/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-C	Units:	ug/Kg (ppb)
Lab Code:	K9705278-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	2.2	
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	2.2	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.7	1	8/7/97	8/15/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	3.4	BJ
Methoxychlor	EPA 3550A	8080A	4	4	1	8/7/97	8/15/97	ND	DF
Toxaphene	EPA 3550A	8080A	60	60	1	8/7/97	8/15/97	ND	DF
Chlordane	EPA 3550A	8080A	10	10	1	8/7/97	8/15/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	5	J
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	22	
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	70	

Approved By: Jay Date: 8-20-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-21	Units:	ug/Kg (ppb)
Lab Code:	K9705278-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
beta-BHC	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
gamma-BHC (Lindane)	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
delta-BHC	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Heptachlor	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Aldrin	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Heptachlor Epoxide	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endosulfan I	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Dieldrin	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
4,4'-DDE	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endrin	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endosulfan II	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
4,4'-DDD	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	3.3	DG,J
Endrin Aldehyde	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Endosulfan Sulfate	EPA 3550A	8080A	20	5.0	10	8/7/97	8/15/97	ND	DG,DF
4,4'-DDT	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	14	DG,BJ
Methoxychlor	EPA 3550A	8080A	40	1.0	10	8/7/97	8/15/97	ND	DG
Toxaphene	EPA 3550A	8080A	30	20	1	8/7/97	8/15/97	ND	DF
Chlordane	EPA 3550A	8080A	10	5	1	8/7/97	8/15/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	20	20	1	8/7/97	8/15/97	ND	DF
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	5	1	8/7/97	8/15/97	ND	DF
Aroclor 1248	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	10	5	1	8/7/97	8/15/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	

Approved By: _____ Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-BC-22
Lab Code: K9705278-006
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
beta-BHC	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
gamma-BHC (Lindane)	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
delta-BHC	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Heptachlor	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Aldrin	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Heptachlor Epoxide	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endosulfan I	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Dieldrin	EPA 3550A	8080A	20	5.0	10	8/7/97	8/15/97	ND	DG,DF
4,4'-DDE	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endrin	EPA 3550A	8080A	20	4.0	10	8/7/97	8/15/97	ND	DG
Endosulfan II	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
4,4'-DDD	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	12	DG,J
Endrin Aldehyde	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	ND	DG
Endosulfan Sulfate	EPA 3550A	8080A	40	40	10	8/7/97	8/15/97	ND	DG,DF
4,4'-DDT	EPA 3550A	8080A	20	2.0	10	8/7/97	8/15/97	7.2	DG,BJ
Methoxychlor	EPA 3550A	8080A	40	30	10	8/7/97	8/15/97	ND	DG,DF
Toxaphene	EPA 3550A	8080A	30	6	1	8/7/97	8/15/97	ND	DF
Chlordane	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	35	35	1	8/7/97	8/15/97	ND	DF
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1254	EPA 3550A	8080A	35	35	1	8/7/97	8/15/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	5	J

Approved By: _____ Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-23	Units:	ug/Kg (ppb)
Lab Code:	K9705278-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.8	1	8/7/97	8/15/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	1.7	BJ
Methoxychlor	EPA 3550A	8080A	4	1	1	8/7/97	8/15/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	8/7/97	8/15/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	

Approved By: JWS Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-26	Units:	ug/Kg (ppb)
Lab Code:	K9705278-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	0.2	J
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	0.7	J
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	1.3	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	1.9	BJ
Methoxychlor	EPA 3550A	8080A	4	1	1	8/7/97	8/15/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	8/7/97	8/15/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	15	15	1	8/7/97	8/15/97	ND	DT
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	6	1	8/7/97	8/15/97	ND	DT
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	

Approved By: Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-29	Units:	ug/Kg (ppb)
Lab Code:	K9705278-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	0.4	J
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	3.0	
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	2.4	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	2.0	1	8/7/97	8/15/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	2.1	BJ
Methoxychlor	EPA 3550A	8080A	4	3	1	8/7/97	8/15/97	ND	DF
Toxaphene	EPA 3550A	8080A	40	40	1	8/7/97	8/15/97	ND	DF
Chlordane	EPA 3550A	8080A	10	10	1	8/7/97	8/15/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/15/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/15/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	6	J
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	8/7/97	8/15/97	27	
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/15/97	30	

Approved By: _____ Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-BC-36
Lab Code: K9705278-001
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	2.5	
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/15/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	1.4	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	2.0	1	8/7/97	8/15/97	ND	DF
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/15/97	0.9	BJ
Methoxychlor	EPA 3550A	8080A	4	1	1	8/7/97	8/15/97	ND	
Toxaphene	EPA 3550A	8080A	40	40	1	8/7/97	8/14/97	ND	DF
Chlordane	EPA 3550A	8080A	15	15	1	8/7/97	8/14/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	8/7/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	12	
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	8/7/97	8/14/97	44	
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	49	

Approved By: _____ Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	K970807-MB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	8/7/97	8/14/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	8/7/97	8/14/97	1.0	J
Methoxychlor	EPA 3550A	8080A	4	1	1	8/7/97	8/14/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	8/7/97	8/14/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	8/7/97	8/14/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	8/7/97	8/14/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	8/7/97	8/14/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	8/7/97	8/14/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	8/7/97	8/14/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	8/7/97	8/14/97	ND	

Approved By: Jay Date: 8-20-97

05278SVG.VNT - MB 8/19/97
1S44/052595

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-C	Units:	ug/Kg (ppb)
Lab Code:	K9705278-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	11	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	38	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	6	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	10	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	3	J
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	9	
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	47	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	13	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	62	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	56	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	28	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	35	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	27	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	28	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	37	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	28	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	5	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	27	

Approved By: _____ Date: 9/2/97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-21	Units:	ug/Kg (ppb)
Lab Code:	K9705278-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/8/97	7	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	2	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/8/97	14	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	145	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	9	
Fluorene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	61	
anthrene	EPA 3545	SIM	500	0.8	100	7/31/97	8/20/97	1900	
..nracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	189	
Fluoranthene	EPA 3545	SIM	500	0.6	100	7/31/97	8/20/97	2000	
Pyrene	EPA 3545	SIM	500	0.8	100	7/31/97	8/20/97	2200	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/8/97	97	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	109	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/8/97	54	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	59	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	103	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/8/97	74	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	10	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/8/97	78	

Approved By: _____ Date: 9/2/97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-22	Units:	ug/Kg (ppb)
Lab Code:	K9705278-006	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	500	0.4	100	7/31/97	8/22/97	5300	
2-Methylnaphthalene	EPA 3545	SIM	50	0.5	10	7/31/97	8/20/97	1700	
Acenaphthylene	EPA 3545	SIM	500	0.2	100	7/31/97	8/22/97	8500	
Acenaphthene	EPA 3545	SIM	5000	0.5	1000	7/31/97	8/22/97	79000	
Dibenzofuran	EPA 3545	SIM	50	0.5	10	7/31/97	8/20/97	2100	
·ene	EPA 3545	SIM	5000	0.5	1000	7/31/97	8/22/97	44000	
,anthrene	EPA 3545	SIM	5000	0.8	1000	7/31/97	8/22/97	180000	
Anthracene	EPA 3545	SIM	5000	0.6	1000	7/31/97	8/22/97	77000	
Fluoranthene	EPA 3545	SIM	5000	0.6	1000	7/31/97	8/22/97	250000	
Pyrene	EPA 3545	SIM	5000	0.8	1000	7/31/97	8/22/97	260000	
Benz(a)anthracene	EPA 3545	SIM	5000	0.7	1000	7/31/97	8/22/97	67000	
Chrysene	EPA 3545	SIM	5000	0.6	1000	7/31/97	8/22/97	86000	
Benzo(b)fluoranthene	EPA 3545	SIM	5000	0.8	1000	7/31/97	8/22/97	49000	
Benzo(k)fluoranthene	EPA 3545	SIM	5000	0.6	1000	7/31/97	8/22/97	54000	
Benzo(a)pyrene	EPA 3545	SIM	5000	0.5	1000	7/31/97	8/22/97	99000	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5000	0.7	1000	7/31/97	8/22/97	74000	
Dibenz(a,h)anthracene	EPA 3545	SIM	500	0.5	100	7/31/97	8/22/97	9100	
Benzo(g,h,i)perylene	EPA 3545	SIM	5000	0.4	1000	7/31/97	8/22/97	76000	

Approved By: _____ Date: 9/2/97

IS22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-23	Units:	ug/Kg (ppb)
Lab Code:	K9705278-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/8/97	0.5	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	1	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/8/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	ND	
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/8/97	1	J
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	0.8	J
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/8/97	0.8	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/8/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/8/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/8/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/8/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/8/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/8/97	0.6	J

Approved By: _____ Date: 9/2/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-26	Units:	ug/Kg (ppb)
Lab Code:	K9705278-004	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	1	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	1	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	0.7	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	ND	
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	0.5	J
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	4	J
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	0.8	J
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	6	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	6	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	3	J
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	3	J
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	3	J
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	3	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	2	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	0.7	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	3	J

Approved By: _____ Date: 9/2/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-29	Units:	ug/Kg (ppb)
Lab Code:	K9705278-002	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	22	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	69	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/7/97	4	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	8	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	4	J
rene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	9	
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	50	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	13	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	73	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	73	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	44	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	49	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/7/97	31	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/7/97	32	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	41	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/7/97	25	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/7/97	7	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/7/97	23	

Approved By: _____ Date: 9/2/97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-36	Units:	ug/Kg (ppb)
Lab Code:	K9705278-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/6/97	41	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	18	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/6/97	6	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	16	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	7	
·ene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	15	
.anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	81	
Anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	21	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	93	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	93	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/6/97	33	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	40	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/6/97	25	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/6/97	24	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	33	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/6/97	27	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/6/97	7	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/6/97	30	

Approved By: _____ Date: 8/21/97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702057-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/31/97	8/5/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/31/97	8/5/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
anthracene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/31/97	8/5/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/31/97	8/5/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/31/97	8/5/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/31/97	8/5/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/31/97	8/5/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/31/97	8/5/97	ND	

Approved By: _____ Date: 9/2/97

1S22/022897a

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97

Duplicate Summary

Total Solids

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	160.3M	Basis:	NA
Test Notes:			

Sample Name	Lab Code	Date Analyzed	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
WR-BC-36	K9705278-001DUP	7/31/97	59.8	60.3	60.1	<1	

Approved By: LM Date: 8/5/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97
Date Extracted: NA
Date Analyzed: 8/8/97

Duplicate Summary
Carbon, Total Organic

Sample Name: WR-BC-36
Lab Code: K9705278-001DUP
Test Notes:

Units: PERCENT
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	1.43	1.28	1.36	11	

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Approved By: _____ Date: 9/8/97

DUP/020597p
05276WET.L/2 - DUP 9/3/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	NA
		Date Analyzed:	8/8/97

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	WR-BC-36	Units:	PERCENT
Lab Code:	K9705278-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	1.99	1.43	3.39	98	75-125	

282

Approved By: S Date: 9/9/97

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MS/020597p
05278WET LJ2 - MS 9/3/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97
Date Extracted: NA
Date Analyzed: 8/7/97

Duplicate Summary
Sulfide, Acid-Volatile

Sample Name: WR-BC-36
Lab Code: K9705278-001DUP
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.9	22	24	23	9	

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Approved By: aup Date: 8/20/97

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DUP/020597p
05278WET LJ1 - DUP 8/20/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	NA
		Date Analyzed:	8/7/97

Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name:	WR-BC-36	Units:	mg/Kg (ppm)
Lab Code:	K9705278-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.9	860	22	730	82	75-125	

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Approved By: alp Date: 8/20/97

MS/020597p
05278WET LJ1 - MS 8/20/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Duplicate Summary
Total Metals

Sample Name: WR-BC-36
Lab Code: K9705278-001D
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Arsenic	3050A	200.8	0.5	2.1	2.8	2.4	29	
Cadmium	3050A	200.8	0.02	0.30	0.25	0.28	18	
Chromium	3050A	200.8	0.5	26.2	24.2	25.2	8	
Copper	3050A	200.8	0.1	27.7	27.0	27.4	3	
Lead	3050A	200.8	0.02	32.2	27.6	27.1	17	
Mercury	7471A	7471A	0.05	0.09	0.11	0.010	20	
Nickel	3050A	200.8	0.5	20.0	18.7	19.4	7	
Silver	3050A	200.8	0.02	0.27	0.19	0.23	35	
Zinc	3050A	200.8	0.5	171	168	170	3	

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Approved By: _____ Date: 9/8/97

DUP/031695

00043

0527KICP.GII - DUP 9/3/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	7/30/97
		Date Analyzed:	7/31/97

Matrix Spike Summary
Total Metals

Sample Name:	WR-BC-36	Units:	mg/Kg (ppm)
Lab Code:	K9705278-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic	3050A	200.8	0.5	17	2.1	16.3	84	75-125	
Cadmium	3050A	200.8	0.02	4.2	0.30	3.90	86	75-125	
Chromium	3050A	200.8	0.5	17	26.2	40.5	84	75-125	
Copper	3050A	200.8	0.1	21	27.7	49.0	101	75-125	
Lead	3050A	200.8	0.02	42	32.2	73.3	98	75-125	
Mercury	7471A	7471A	0.05	0.47	0.09	0.55	98	75-125	
Nickel	3050A	200.8	0.5	42	20.0	54.3	82	75-125	
Silver	3050A	200.8	0.02	4.2	0.27	3.80	84	75-125	
Zinc	3050A	200.8	0.5	42	171	204	79	75-125	

Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/30/97
		Date Analyzed:	7/31/97

Laboratory Control Sample Summary
Total Metals

Sample Name:	Laboratory Control Sample	Units:	mg/Kg (ppm)
Lab Code:	K9705278-LCS	Basis:	Dry
Test Notes:			

Source: Environmental Resource Associates

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Control Limits	Result Notes
Arsenic	3050A	200.8	62.7	59.1	94	70-130	
Cadmium	3050A	200.8	77.4	70.2	91	66-133	
Chromium	3050A	200.8	76.9	81.6	106	77-123	
Copper	3050A	200.8	58.2	55.0	95	79-121	
Lead	3050A	200.8	122	120	98	68-131	
Mercury	7471A	7471A	2.51	2.31	92	64-136	
Nickel	3050A	200.8	163	155	95	75-125	
Silver	3050A	200.8	69.6	69.1	99	74-126	
Zinc	3050A	200.8	114	113	99	74-126	

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Approved By: _____ Date: 9/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	8/7/97
		Date Analyzed:	8/14,15/97

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Prep Method:	EPA 3550A	Units:	PERCENT
Analysis Method:	8080A	Basis:	NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tetrachloro-m-xylene	Percent Recovery Decachlorobiphenyl
WR-BC-36	K9705278-001		52	60
WR-BC-29	K9705278-002		64	70
WR-C	K9705278-003		52	54
WR-BC-26	K9705278-004		62	69
WR-BC-23	K9705278-005		57	72
WR-BC-22	K9705278-006		73	73
WR-BC-21	K9705278-007		63	94
WR-BC-36	K9705278-001MS		62	63
WR-BC-36	K9705278-001DMS		59	60
Lab Control Sample	K970807-LCS		69	78
Method Blank	K970807-MB		13 CI	68
CAS Acceptance Limits:			20-107	20-142

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Approved By: Jay Date: 8-20-97

SUR2/052595
05278SVG VNI - SUR2 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	8/7/97
		Date Analyzed:	8/15/97

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-BC-36	Units:	ug/Kg (ppb)
Lab Code:	K9705278-001MS, K9705278-001DMS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	2	13	13	ND	10	10	77	77	20-141	<1	
Heptachlor	EPA 3550A	8080A	2	13	13	ND	10	10	77	77	20-108	<1	
Aldrin	EPA 3550A	8080A	2	13	13	ND	11	11	85	85	20-181	<1	
Dieldrin	EPA 3550A	8080A	2	13	13	ND	12	12	92	92	20-183	<1	
Endrin	EPA 3550A	8080A	2	13	13	ND	12	13	92	100	20-164	8	
4,4'-DDT	EPA 3550A	8080A	2	13	13	0.9	10	13	70	93	20-185	26	

Approved By: Jay Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/7/97
		Date Analyzed:	8/14/97

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	K970807-LCS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	13	12	92	21-123	
Heptachlor	EPA 3550A	8080A	13	13	100	31-112	
Aldrin	EPA 3550A	8080A	13	12	92	26-127	
Dieldrin	EPA 3550A	8080A	13	14	108	20-161	
Endrin	EPA 3550A	8080A	13	14	108	32-135	
',4'-DDT	EPA 3550A	8080A	13	15	115	30-146	

Approved By: Jus Date: 8-20-97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	8/11/97
		Date Analyzed:	8/13/97

Surrogate Recovery Summary
Butyltins in porewater

Prep Method:	METHOD	Units:	PERCENT
Analysis Method:	Butyltins-GC	Basis:	NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tri-n-propyltin	Percent Recovery Tri-n-pentyltin
WR-BC-36	K9705278-001		71	96
WR-BC-29	K9705278-002		67	97
WR-C	K9705278-003		76	101
WR-BC-26	K9705278-004		75	95
WR-BC-23	K9705278-005		64	81
WR-BC-21	K9705278-007		73	96
WR-BC-26	K9705278-004MS		75	102
WR-BC-26	K9705278-004DMS		80	102
Lab Control Sample	K970811-LCS		70	95
Method Blank	K970811-MB		74	96

CAS Acceptance Limits: 20-113 20-133

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Approved By: MMarthe Date: 8/18/97

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SUR2/052595
05278SVG.BT1 - SUR 8/18/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	8/11/97
		Date Analyzed:	8/13/97

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins in porewater

Sample Name:	WR-BC-26	Units:	ug/L (ppb)
Lab Code:	K9705278-004MS, K9705278-004DMS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.05	4.3	4.3	0.01	3.8	3.7	88	86	20-127	3	

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Approved By: MManthe Date: 8/18/97

DMS/052595

05278SVG BTI - DMS 8/18/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	8/11/97
		Date Analyzed:	8/13/97

Laboratory Control Sample Summary
Butyltins in porewater

Sample Name:	Lab Control Sample	Units:	ug/L (ppb)
Lab Code:	K970811-LCS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Tri-n-butyltin	METHOD	Butyltins-GC	0.50	0.41	82	20-138	

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Approved By: MManthe Date: 8/18/97

LCS/52595
05278SVG BT1 - LCS 8/18/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705278
Date Collected: 7/24/97
Date Received: 7/25/97
Date Extracted: 7/31/97
Date Analyzed: 8/5 - 8/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-BC-36	K9705278-001		43	56	47
WR-BC-29	K9705278-002		39	49	42
WR-C	K9705278-003		38	48	39
WR-BC-26	K9705278-004		29	40	37
WR-BC-23	K9705278-005		20	32	35
WR-BC-22	K9705278-006		32	30	47
WR-BC-21	K9705278-007		36	46	37
WR-BC-36	K9705278-001MS		44	48	38
W[illegible]-36	K9705278-001DMS		41	47	40
l[illegible]trol Sample	KWG9702057-3		33	42	35
Method Blank	KWG9702057-4		49	53	51
CAS Acceptance Limits:			13-142	13-142	15-145

Approved By: [illegible] Date: 8/e 9/2/97

SUR3/050897a
05278SVM WN2 - SUR 8/23/97

Page No

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705278
Project:	Channel Deepening/J5672	**Date Collected:**	7/24/97
Sample Matrix:	Sediment	**Date Received:**	7/25/97
		Date Extracted:	7/31/97
		Date Analyzed:	8/5 - 6/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-BC-36		Units:	ug/Kg (ppb)
Lab Code:	K9705278-001MS	K9705278-001DMS	Basis:	Dry
Test Notes:				

				Spike Level		Sample	Spike Result		Percent Recovery				
Analyte	**Prep Method**	**Analysis Method**	**MRL**	MS	DMS	**Result**	MS	DMS	MS	DMS	CAS Acceptance Limits	**Relative Percent Difference**	**Result Notes**
Acenaphthene	EPA 3545	SIM	5	400	410	16	187	200	43	45	12-133	5	
Pyrene	EPA 3545	SIM	5	400	410	93	271	346	44	62	10-160	34	
Benzo(a)pyrene	EPA 3545	SIM	5	400	410	33	216	258	46	55	10-160	18	

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Approved By: _____ Date: 9/2/97

00053

DMS/031497a
05278SVM WN2 - DMS 8/23/97

Page No.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
LCS Matrix: Sediment

Service Request: K9705278
Date Collected: NA
Date Received: NA
Date Extracted: 7/31/97
Date Analyzed: 8/5/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: Lab Control Sample
Lab Code: KWG9702057-3
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	25	30	36-119	EU
Pyrene	EPA 3545	SIM	83	32	39	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	34	41	24-137	

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Approved By: _____ Date: 9/2/97

LCS/031497a
05278SVM WNZ - LCS 8/23/97

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client Hart Crowser Work Order K97 5278.

Cooler received on 7/25 and opened on 7/26 by DW

1.	Were custody seals on outside of cooler?	YES NO
	If yes, how many and where? F	
2.	Were signature & date correct?	YES NO
3.	Were custody papers properly filled out (ink, signed, etc)?	YES NO
4.	Did all bottles arrive in good condition (unbroken)?	YES NO
5.	Were all bottle labels complete (*i.e.* analysis, preservation, etc)?	YES NO
6.	Did all bottle labels and tags agree with custody papers?	YES NO
7.	Were correct bottles used for the tests indicated?	YES NO
8.	Were VOA vials checked for absence of air bubbles, and noted if so?	~~YES NO~~
9.	Did the bottles originate from CAS/Kelso or a branch laboratory?	YES NO

10. Chain-of-custody identification number:					
Temperature of cooler(s) upon receipt:	10.5°	2.5	3.8		
Temperature Blank:					
Is the temperature within 4 ± 2° C?:	Yes ☐	Yes ☒	Yes ☒	Yes ☐	Yes ☐
	No ☒	No ☐	No ☐	No ☐	No ☐

Explain any discrepancies

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					

YES = All samples OK
NO = Samples were preserved at lab as listed

VOC Vial pH Verification (Tested after Analysis) ☐ All Samples pH ≤ 2 ☐ Following Samples Exhibited pH > 2			Samples received outside of temperature range	Sample I.D.
			297	
			297	

00057

K5278

Sample Custody Record

DATE 7.25.97 PAGE 1 OF 1

HARTCROWSER

Hart Crowser, Inc.
Five Centerpointe Drive, Suite 240
Lake Oswego, Oregon 97035

JOB NUMBER J5672 LAB NUMBER

PROJECT MANAGER TAKU FUJI

PROJECT NAME POP WILLAMETTE R. SAMPLING

SAMPLED BY: RRS, JPF

LAB NO.	SAMPLE	TIME	STATION	MATRIX	ORG. - PEST/PCBs	VOLATILES	METALS	TBT							NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
-1	WR-BC-30	945		SEDIMENT	1	2	2	5							10	MS/MSD
2	WR-BC-29	1029			1	2	2	4							9	
3	WR-C	1029			1	2	2	4							9	
4	WR-BC-26	1203			1	2	2	4							9	COMP OF WR-BC-26,27,28
5	WR-BC-23	1259			1	2	2	4							9	
6	WR-BC-22	1328			1	2	2	4							9	
7	WR-BC-21	1357			1	2	2	4							9	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Ryan Julbal	7.25.97	SIGNATURE: [illegible]	7-25-97
PRINTED NAME: RYAN SEELBACH	TIME	PRINTED NAME: [illegible]	TIME
COMPANY: HART CROWSER		COMPANY: CAS	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE: Lori K. Hawn	072697
PRINTED NAME	TIME	PRINTED NAME: Lori K. Hawn	TIME
COMPANY		COMPANY: CAS-K	0800

TOTAL NUMBER OF CONTAINERS 66

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS 4°C

DISTRIBUTION:

1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER

0003

Sample Custody Record

DATE 7.25.97 PAGE 1 OF 1

HARTCROWSER

Hart Crowser, Inc.
Five Centerpointe Drive, Suite 240
Lake Oswego, Oregon 97035

JOB NUMBER J5672 LAB NUMBER

PROJECT MANAGER TAKU FUJI

PROJECT NAME PORT OF PORTLAND
WILLAMETTE R SAMPLING

SAMPLED BY: RRS, JPF

LAB NO.	SAMPLE	TIME	STATION	MATRIX	TESTING: GRAIN-SIZE										NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	WR-BC-36	945		SEDIMENT	1										1	
	WR-BC-29	1029			1										1	
	WR-C	1029			1										1	
	WR-BC-26	1203			1										1	
	WR-BC-23	1259			1										1	
	WR-BC-22	1328			1										1	
	WR-BC-21	1357			1										1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Ryan Seelbach (SIGNATURE)	7.25.97	Shirley Torres (SIGNATURE)	7/30/97
RYAN SEELBACH (PRINTED NAME)	TIME	Shirley TORRES (PRINTED NAME)	TIME
HART CROWSER (COMPANY)		COE (COMPANY)	0930

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINTED NAME	TIME	PRINTED NAME	TIME
COMPANY		COMPANY	

TOTAL NUMBER OF CONTAINERS 7

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS

DISTRIBUTION:

1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER

24928

Columbia Analytical Services, Inc.

EPA Method 160.3 - Total Solids

00058

Workgroup: **KWG9702064**

Analyst: AMILLER

Reviewed By: [illegible]

Date Acquired: 31 Jul 97 05:40 PM

Date Reviewed: 8/5/97

Date Completed: 1 Aug 97 09:13 AM

Oven Temp: 105

298

#	Labcode	Tare	Wet Wt	Tare+Dry	Dry Wt	% Solids	Description	Matrix	Sample Name	QC Ref Sample
1	K9705178-003	1.29	15.49	13.32	12.03	77.7		SOIL	141F041	
2	K9705178-005	1.29	11.20	10.11	8.82	78.8		SOIL	141F050	
3	K9705178-006	1.25	10.94	10.66	9.41	86.0		SOIL	141F046	
4	K9705254-001	1.29	11.45	5.34	4.05	35.4		SOIL	97MPT038SL	
5	K9705254-002	1.30	10.44	9.57	8.27	79.2		SOIL	97MPT020SL	
6	K9705254-003	1.28	11.76	9.05	7.77	66.1		SOIL	97MPT036SL	
7	K9705254-004	1.31	10.94	10.98	9.67	88.4		SOIL	97MPT031SL	
8	K9705278-001	1.33	16.28	11.07	9.74	59.8		SEDIMEN	WR-BC-36	
9	K9705278-002	1.25	13.29	9.01	7.76	58.4		SEDIMEN	WR-BC-29	
10	K9705278-003	1.32	17.49	11.72	10.40	59.5		SEDIMEN	WR-C	
11	K9705278-004	1.29	12.32	9.99	8.70	70.6		SEDIMEN	WR-BC-26	
12	K9705278-005	1.39	15.38	13.36	11.97	77.8		SEDIMEN	WR-BC-23	
13	K9705278-006	1.36	13.04	12.08	10.72	82.2		SEDIMEN	WR-BC-22	
14	K9705278-007	1.33	16.04	13.61	12.28	76.6		SEDIMEN	WR-BC-21	
15	K9705333-001	1.34	12.35	11.87	10.53	85.3		SOIL	97GARM03SL	
16	K9705385-001	1.33	10.12	10.51	9.18	90.7		SOIL	RW-1-1	
17	K9705385-002	1.36	15.64	13.40	12.04	77.0		SOIL	RW-1-4	
18	K9705385-004	1.33	13.87	14.84	13.51	97.4		SOIL	RW-2-1	
19	K9705385-005	1.31	23.02	18.99	17.68	76.8		SOIL	RW-2-6.5	
20	K9705385-006	1.28	11.89	12.86	11.58	97.4		SOIL	RW-3-1	
21	K9705385-007	1.29	10.46	11.12	9.83	94.0		SOIL	RW-3-4	
22	K9705385-009	1.25	15.45	16.09	14.84	96.1		SOIL	RW-4-1	
23	K9705385-010	1.29	8.83	9.35	8.06	91.3		SOIL	RW-4-4	
24	K9705385-012	1.30	10.82	11.82	10.52	97.2		SOIL	RW-5-1	
25	K9705385-013	1.27	12.25	12.05	10.78	88.0		SOIL	RW-5-4	
26	K9705385-015	1.28	10.55	10.59	9.31	88.2		SOIL	RW-6-1	
27	K9705385-016	1.29	9.47	9.42	8.13	85.9		SOIL	RW-6-4	

Columbia Analytical Services, Inc.

EPA Method 160.3 - Total Solids

Workgroup: **KWG9702064**

Analyst: AMILLER

Date Acquired: 31 Jul 97 05:40 PM

Date Completed: 1 Aug 97 09:13 AM

Oven Temp: 105

Reviewed By:

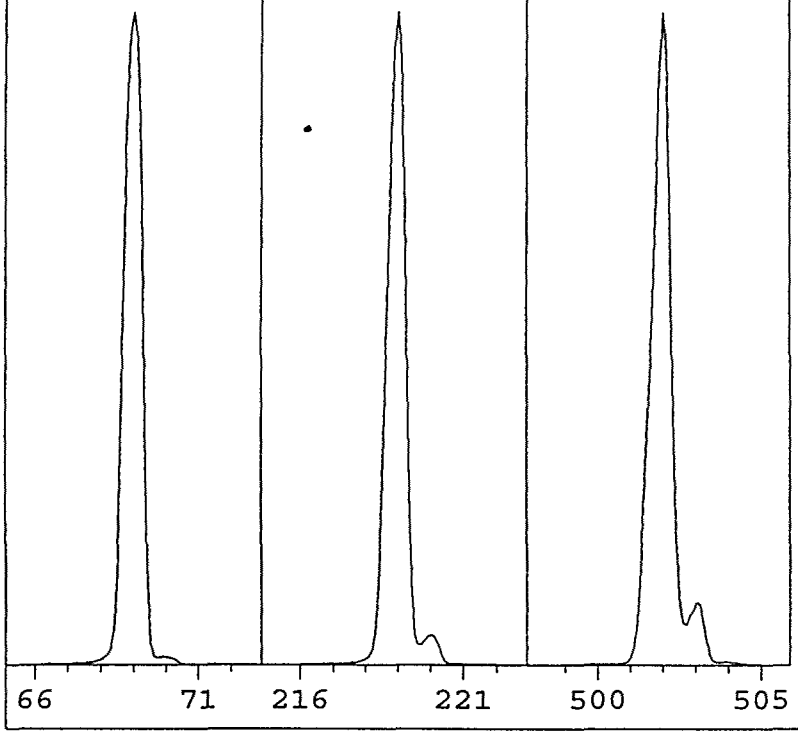
Date Reviewed:

#	Labcode	Tare	Wet Wt	Tare+Dry	Dry Wt	% Solids	Description	Matrix	Sample Name	QC Ref Sample
28	K9705385-018	1.28	7.72	7.72	6.44	83.4		SOIL	RW-7-1	
29	K9705385-019	1.27	10.64	9.58	8.31	78.1		SOIL	RW-7-4	
30	K9705385-021	1.29	11.73	12.45	11.16	95.1		SOIL	RW-8-1	
31	K9705385-022	1.27	14.58	11.64	10.37	71.1		SOIL	RW-8-4	
32	KWG9702064-1	1.26	16.94	11.48	10.22	60.3		SEDIMEN	Duplicate Client Sam	K9705278-001
33	KWG9702064-2	1.33	14.69	13.40	12.07	82.2		SEDIMEN	Duplicate Client Sam	K9705333-001
34	KWG9702064-3	1.29	11.22	9.99	8.70	77.5		SEDIMEN	Duplicate Client Sam	K9705178-003
35	KWG9702064-4	1.26	9.65	4.60	3.34	34.6		SEDIMEN	Duplicate Client Sam	K9705254-001

HP5972

Tue Aug 05 15:12:13 1997 J:\MS07\TUNES\SIM.U

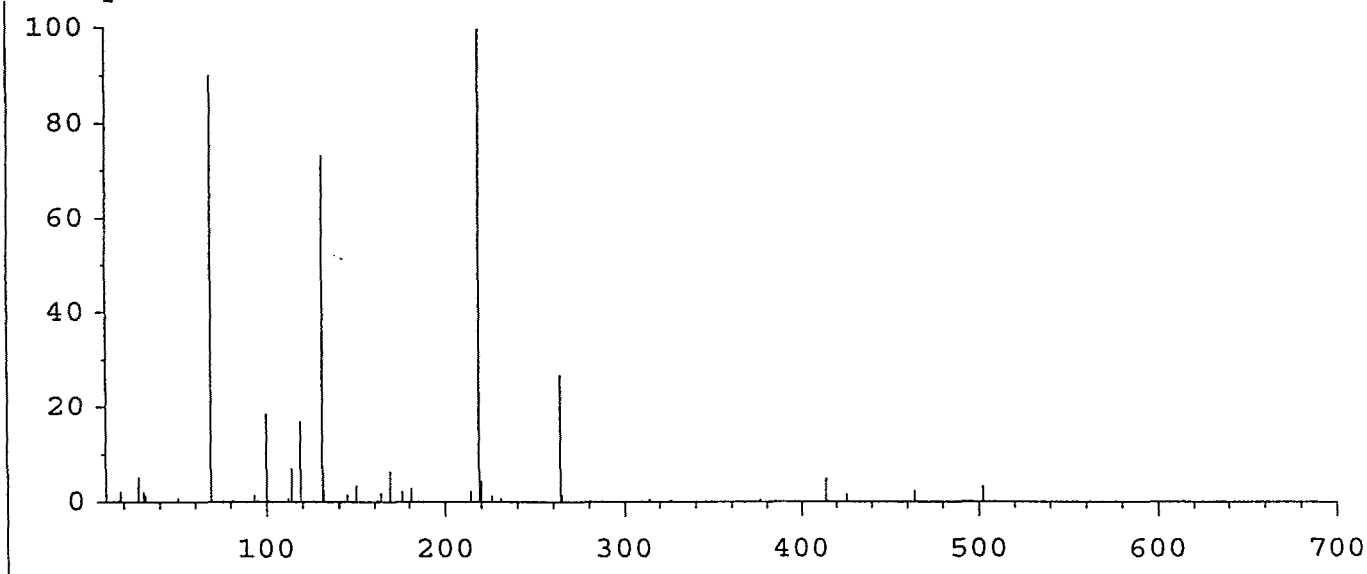
Mass	69.00	Mass	218.95	Mass	502.00
Ab	1220275	Ab	1358837	Ab	49952
Pw50	0.63	Pw50	0.61	Pw50	0.61



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	181	TTI	OFF
Vacuum	42	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

can: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
223 peaks Base: 218.90 Abundance: 1296384



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	1169408	100.00	0.00	0	0.00
218.90	1296384	110.86	219.90	58816	4.54
501.95	45528	3.89	502.95	4347	9.55

8/6/97

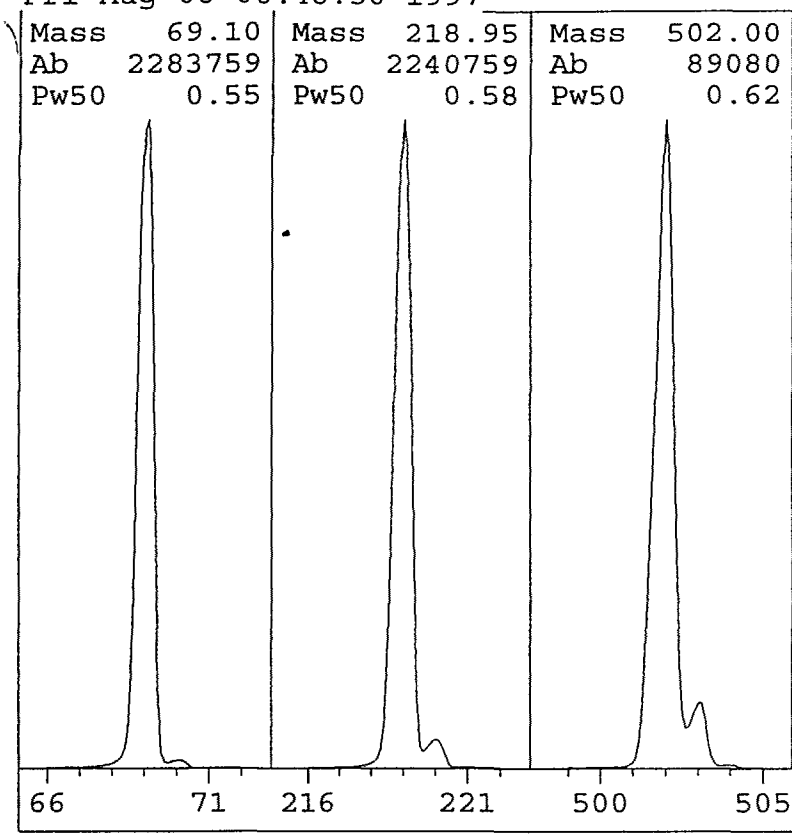
TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	81.5	110.9	3.9

300

00060

HP5972

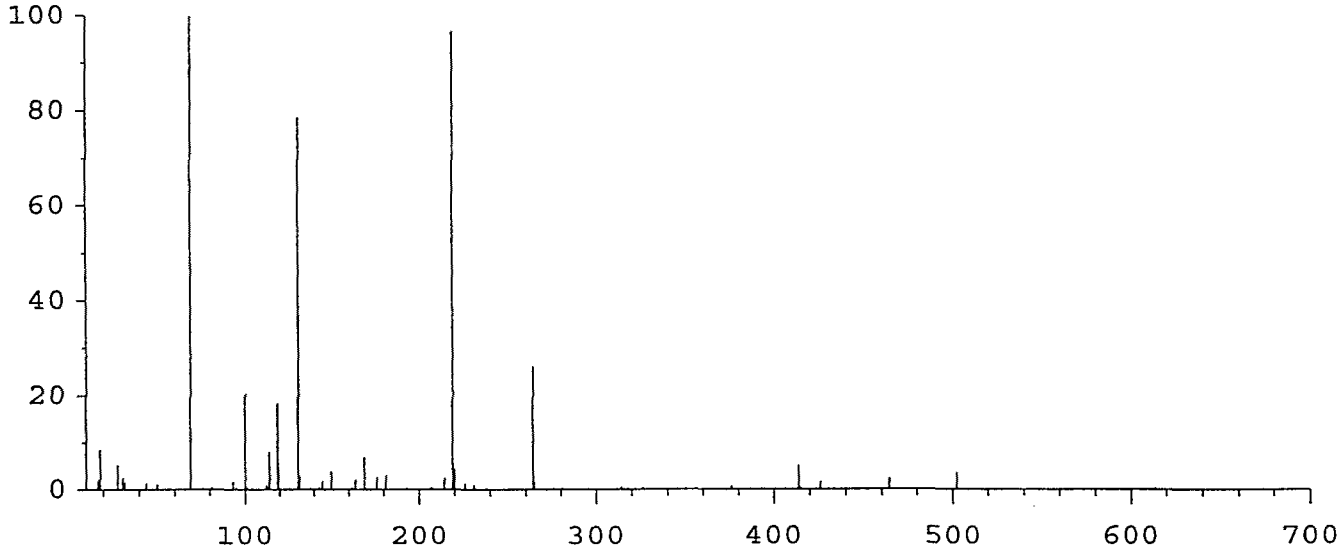
Fri Aug 08 06:48:50 1997 J:\MS07\TUNES\SIM.U



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	185	TTI	OFF
Vacuum	33	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
281 peaks Base: 69.00 Abundance: 2199552



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	2199552	100.00	0.00	0	0.00
218.90	2130432	96.86	219.90	99632	4.68
501.95	81336	3.70	502.95	8382	10.31

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	78.6	96.9	3.7

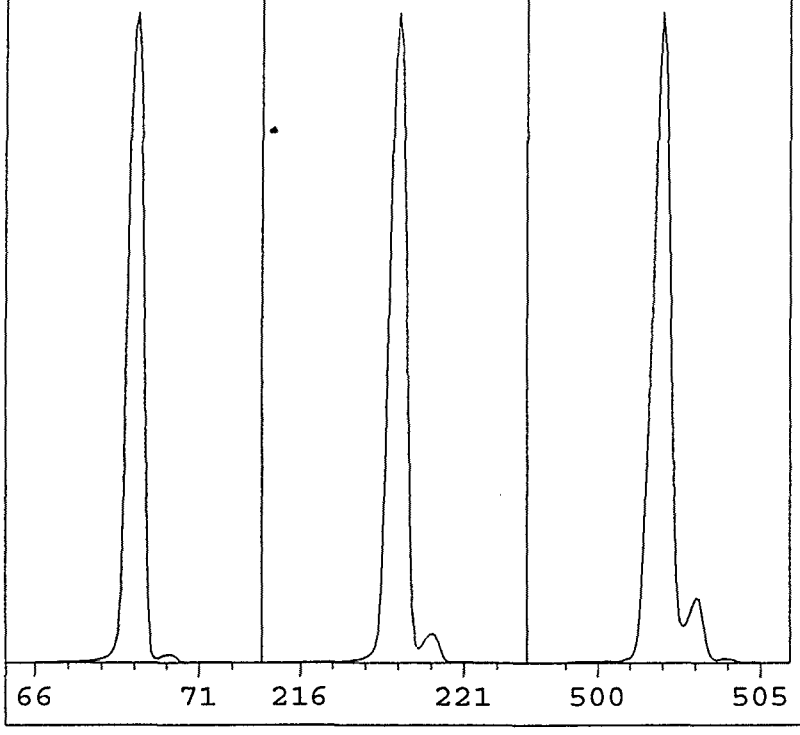
301

ay 9/9/97

HP5972

Fri Aug 08 10:22:36 1997 J:\MS07\TUNES\SIM.U

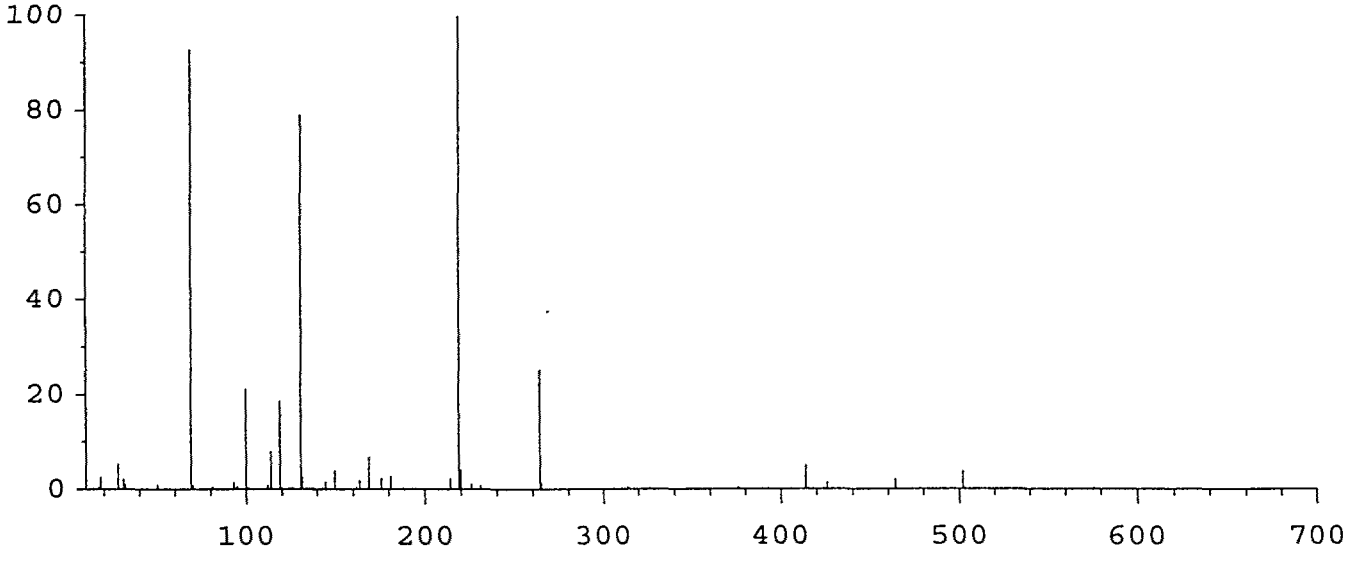
Mass	69.10	Mass	218.95	Mass	502.00
Ab	1234301	Ab	1302199	Ab	55746
Pw50	0.54	Pw50	0.56	Pw50	0.58



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	168	TTI	OFF
Vacuum	35	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
340 peaks Base: 218.90 Abundance: 1356800



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	1260032	100.00	70.00	14956	1.19
218.90	1356800	107.68	219.90	60672	4.47
501.95	53816	4.27	502.95	5634	10.47

8/11/9

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	85.2	107.7	4.3

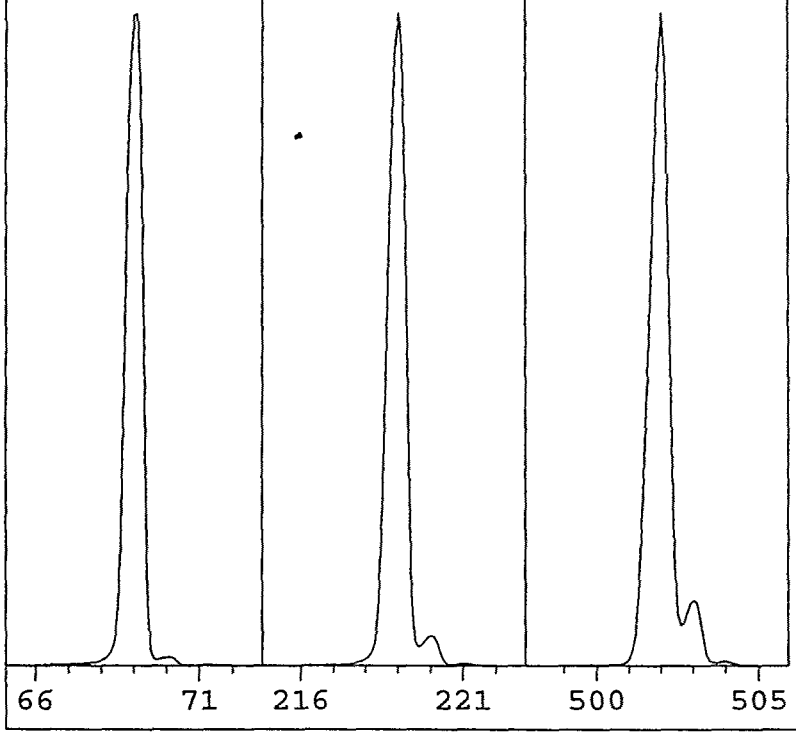
302

00062

HP5972

Wed Aug 20 08:05:19 1997 J:\MS07\TUNES\SIM.U

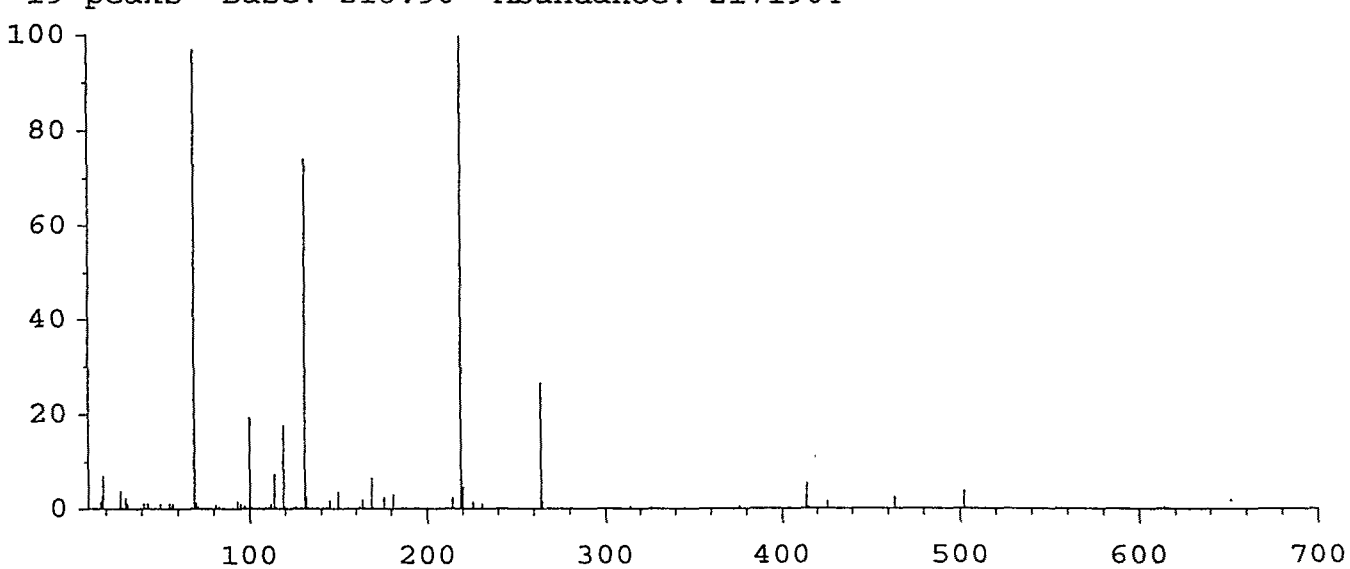
Mass	69.10	Mass	218.95	Mass	502.00
Ab	2200823	Ab	2191116	Ab	95296
Pw50	0.57	Pw50	0.60	Pw50	0.64



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	187	TTI	OFF
Vacuum	38	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
19 peaks Base: 218.90 Abundance: 2171904



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	2106880	100.00	70.00	31896	1.51
218.90	2171904	103.09	219.90	105520	4.86
501.95	86816	4.12	502.95	9169	10.56

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	76.5	103.1	4.1

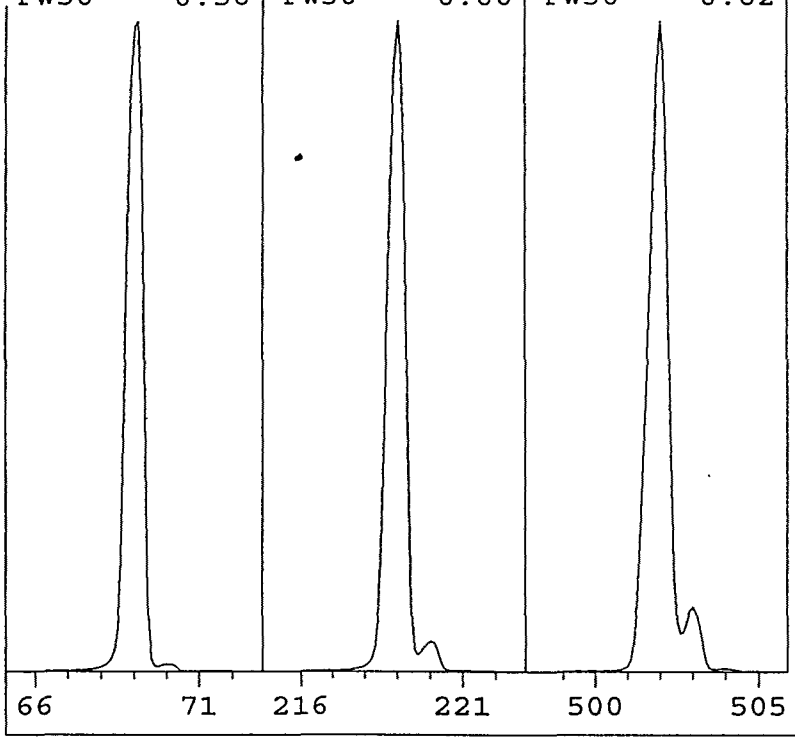
4/5/73/97

00063

HP5972

Fri Aug 22 08:36:52 1997 J:\MS07\TUNES\SIM.U

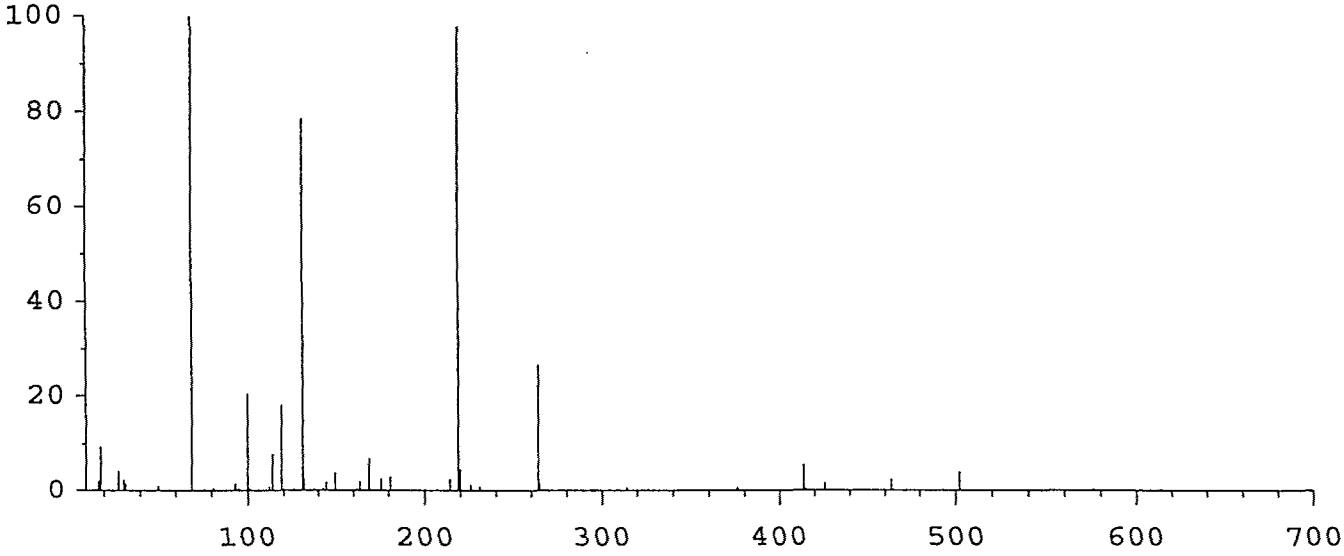
Mass	69.10	Mass	218.95	Mass	502.00
Ab	2140739	Ab	2108009	Ab	94714
Pw50	0.56	Pw50	0.60	Pw50	0.62



EMVolts	2153	AmuGain	312
Xray	51.3	AmuOffs	71
Emission	35.0	Wid219	-0.044
MS Temp	186	TTI	OFF
Vacuum	39	DC Pol	POS
Samples	8	Repeller	33.60
Averages	3	IonFocus	127.0
StepSize	0.10	EntLens	0.00
MassGain	-294	EntOffs	VAR
MassOffs	-2	Filament	2

PFTBA OPEN

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
182 peaks Base: 69.00 Abundance: 2085376



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	2085376	100.00	0.00	0	0.00
218.90	2044928	98.06	219.90	98176	4.80
501.95	88624	4.25	502.95	9054	10.22

TARGET MASS:	69	131	219	502
DYNAMIC ENT OFFSET:	6.8	14.1	19.8	30.6
TARGET ABUND(%):	100.0	60.0	100.0	3.0
ACTUAL TUNE ABUND(%):	100.0	78.7	98.1	4.2

304 9/23/97

HEADER SHEET FOR SEDIMENT SAMPLING TRIP

PROJECT LOCATION: CRCD - Willamette River

SAMPLING DATE: 7/22/97

SAMPLING METHOD (PONAR/BOX CORE/GRAVITY CORE/VIBRA CORE):

SAMPLING ANALYSIS (SAMPLE NUMBERS ANALYZED)

GRAIN SIZE:

OIL/GREASE:

AMMONIA (NH4):

SULFIDE: WR-GC-30A, 31A, 32A, 33A, 18A, 19A, 24A, 24B

TOTAL ORGANIC CARBON (TOC): SAME AS SULFIDE

VOLATILE SOLIDS:

METALS: SAME AS SULFIDE

PESTICIDES: SAME AS SULFIDE

PAH'S: SAME AS SULFIDE

ELUTRIATES:

BIOLOGICAL:

SEDIMENT QUALITY dBASE FILES:

Columbia Analytical Services inc.

August 22, 1997

Service Request No: K9705146

Director
U.S. Army Corps of Engineers
1491 NW Graham Avenue
Troutdale, OR 97060-9503

Re: Channel Deepening/5672

Dear Director:

Enclosed are the results of the sample(s) submitted to our laboratory on . For your reference, these analyses have been assigned our service request number K9705146.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Elizabeth Schneider
Project Chemist

ES/lj

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Hart Crowser, Inc.	**Service Request No.:**	K9705146
Project:	Channel Deepening/5672	**Date Received:**	7/23/97
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier IIA data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

The Matrix Spike (MS) recovery of Acid Volatile Sulfide was outside of normal CAS acceptance limits. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

The 8080 Tetrachloro-m-xylene surrogate recovery in the Method Blank (MB) was outside normal CAS control limits. All other QA/QC associated with the 8080 analysis of these samples was within normal CAS control limits, so no further corrective action was taken.

307
307

Approved by _____ Date 8/27/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97
		Date Extracted:	NA
		Date Analyzed:	7/23/97

Solids, Total
EPA Method 160.3 Modified
Units: Percent (%)

Sample Name	Lab Code	Result
WR-GC-30A	K9705146-001	57.3
WR-GC-32A	K9705146-003	60.5
WR-GC-33A	K9705146-005	59.7
WR-GC-19A	K9705146-007	77.9
GC-18A	K9705146-008	52.6
GC-24A	K9705146-010	60.9
WR-GC-24B	K9705146-011	81.4
WR-GC-31A	K9705146-013	61.2

Approved By: UM Date: 7/25/97

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-18A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	4.5	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.27	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	32.5	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	36.7	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	25.3	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.08	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	23.5	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.27	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	112	

309
3c.9

Approved By: _____ Date: 8/22/97

00010

1S44mc/031695
05146ICP.GJ1 - Sample (5) 8/21/97

Page No.:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-19A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	1.4	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.05	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	15.1	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	13.5	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	2.77	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.03	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	19.2	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	41.6	

Approved By: _____ Date: 8/22/97

1S44me/031695

05146ICP.GIT - Sample (4) 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-24A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-010	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.1	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.20	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	20.4	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	25.3	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	14.8	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.17	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	22.9	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.21	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	85.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-24B	Units:	mg/Kg (ppm)
Lab Code:	K9705146-011	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.4	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.09	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	12.5	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	15.7	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	3.62	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.02	J
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	20.6	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.06	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	39.6	

Approved By: _____ Date: 8/22/97

1S44mc/031695

05146ICP.G11 - Sample (7) 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-30A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	2.8	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.22	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	32.1	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	32.3	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	22.8	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.07	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	23.4	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.28	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	131	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-31A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-013	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	0.6	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.18	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	26.9	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	26.8	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	26.0	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.06	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	21.7	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.21	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	80.6	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
'roject:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-32A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	3.3	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.19	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	28.7	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	31.5	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	22.9	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.07	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	22.6	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.24	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	99.2	

Approved By: _____ Date: 8/22/97

1S44mc/031695

051461CP.GII - Sample (2) 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Total Metals

Sample Name:	WR-GC-33A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	0.29	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	30.4	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	33.0	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	38.7	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	0.09	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	22.8	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	0.33	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	161	

Approved By: _____ Date: 8/22/97

1S44mc/031695

05146ICP.GJI - Sample (3) 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Total Metals

Sample Name:	Method Blank	Units:	mg/Kg (ppm)
Lab Code:	K9705146-MB	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Cadmium	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Chromium	3050A	200.8	0.5	0.2	10	7/30/97	7/31/97	ND	
Copper	3050A	200.8	0.1	0.08	10	7/30/97	7/31/97	ND	
Lead	3050A	200.8	0.02	0.02	10	7/30/97	7/31/97	ND	
Mercury	7471A	7471A	0.05	0.01	1	8/8/97	8/11/97	ND	
Nickel	3050A	200.8	0.5	0.08	10	7/30/97	7/31/97	ND	
Silver	3050A	200.8	0.02	0.008	10	7/30/97	7/31/97	ND	
Zinc	3050A	200.8	0.5	0.4	10	7/30/97	7/31/97	ND	

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Approved By: S Date: 8/22/97

1S44mc/031695

051461CP.GI1 - Sample (9) 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Carbon, Total Organic

Prep Method: NONE
Analysis Method: ASTM D4129-82M
Test Notes:

Units: PERCENT
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-GC-30A	K9705146-001	0.05	0.05	1	NA	8/4/97	1.80	
WR-GC-32A	K9705146-003	0.05	0.05	1	NA	8/4/97	1.66	
WR-GC-33A	K9705146-005	0.05	0.05	1	NA	8/4/97	1.64	
WR-GC-19A	K9705146-007	0.05	0.05	1	NA	8/4/97	0.07	
WR-GC-18A	K9705146-008	0.05	0.05	1	NA	8/4/97	2.26	
WR-GC-24A	K9705146-010	0.05	0.05	1	NA	8/4/97	1.91	
WR-GC-24B	K9705146-011	0.05	0.05	1	NA	8/4/97	1.85	
WR-GC-31A	K9705146-013	0.05	0.05	1	NA	8/4/97	1.68	
Method Blank	K9705146-MB	0.05	0.05	1	NA	8/4/97	ND	

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Approved By: _____ Date: 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Sulfide, Acid-Volatile

Prep Method:	NONE	Units:	mg/Kg (ppm)
Analysis Method:	Draft Aug 91	Basis:	Dry
Test Notes:			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
WR-GC-30A	K9705146-001	0.7	0.4	1	NA	8/4/97	23	
WR-GC-32A	K9705146-003	0.7	0.4	1	NA	8/4/97	13	
WR-GC-33A	K9705146-005	0.7	0.4	1	NA	8/4/97	46	
WR-GC-19A	K9705146-007	0.7	0.4	1	NA	8/4/97	ND	
WR-GC-18A	K9705146-008	0.7	0.4	1	NA	8/4/97	17.9	
WR-GC-24A	K9705146-010	0.7	0.4	1	NA	8/4/97	34	
WR-GC-24B	K9705146-011	0.7	0.4	1	NA	8/4/97	ND	
WR-GC-31A	K9705146-013	0.7	0.4	1	NA	8/4/97	11.8	
Method Blank	K9705146-MB	0.7	0.4	1	NA	8/4/97	ND	

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Approved By: [signature] Date: 8/8/97 00005

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05146WET.LJ1 - Sample 8/8/97

Page No.:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-18A
Lab Code: K9705146-008
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	2	
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	2	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.8	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	1	J
Toxaphene	EPA 3550A	8080A	40	5	1	7/24/97	8/5/97	ND	DF
Chlordane	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	5	1	7/24/97	8/5/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	25	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
roject:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-19A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/24/97	8/5/97	ND	
'hlordane	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
oclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
.roclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	

Approved By: _____ Date: 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-24A
Lab Code: K9705146-010
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	4	
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	10	7/24/97	8/6/97	100	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	10	7/24/97	8/6/97	94	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	45	5	1	7/24/97	8/5/97	ND	DF
Chlordane	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1221	EPA 3550A	8080A	15	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	30	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	21	

Approved By: _____ Date: 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-24B
Lab Code: K9705146-011
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.2	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	2	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/24/97	8/5/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-30A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	0.8	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/4/97	ND	
Toxaphene	EPA 3550A	8080A	40	5	1	7/24/97	8/5/97	ND	DF
Chlordane	EPA 3550A	8080A	10	6	1	7/24/97	8/5/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	5	1	7/24/97	8/5/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	10	1	7/24/97	8/5/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	20	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	22	

Approved By: _____ Date: 8/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-31A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-013	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.8	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.5	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	20	1	7/24/97	8/6/97	ND	DT
Chlordane	EPA 3550A	8080A	10	4	1	7/24/97	8/6/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/6/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/6/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/6/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/24/97	8/6/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	4	1	7/24/97	8/6/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	10	10	1	7/24/97	8/6/97	ND	DT
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/6/97	9	J

Approved By: _____ Date: 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-32A
Lab Code: K9705146-003
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	1	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.7	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.4	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	ND	
Toxaphene	EPA 3550A	8080A	30	20	1	7/24/97	8/5/97	ND	DT
Chlordane	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	DT
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	DT
Aroclor 1254	EPA 3550A	8080A	10	7	1	7/24/97	8/5/97	ND	DT
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	9	J

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Approved By: _____ Date: 8/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: WR-GC-33A
Lab Code: K9705146-005
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	2	J
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	1	J
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/5/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/5/97	0.3	J
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/5/97	1	J
Toxaphene	EPA 3550A	8080A	50	20	1	7/24/97	8/5/97	ND	DF
Chlordane	EPA 3550A	8080A	15	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1016	EPA 3550A	8080A	10	7	1	7/24/97	8/5/97	ND	DT
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	DT
Aroclor 1248	EPA 3550A	8080A	20	3	1	7/24/97	8/5/97	ND	DF
Aroclor 1254	EPA 3550A	8080A	30	2	1	7/24/97	8/5/97	ND	DF
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	43	

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Approved By: _____ Date: 8/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: NA
Date Received: NA

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: K970724-SB
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
beta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
gamma-BHC (Lindane)	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
delta-BHC	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Heptachlor	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Aldrin	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Heptachlor Epoxide	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Endosulfan I	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Dieldrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
4,4'-DDE	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Endrin	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
Endosulfan II	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
4,4'-DDD	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Endrin Aldehyde	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Endosulfan Sulfate	EPA 3550A	8080A	2	0.4	1	7/24/97	8/4/97	ND	
4,4'-DDT	EPA 3550A	8080A	2	0.2	1	7/24/97	8/4/97	ND	
Methoxychlor	EPA 3550A	8080A	4	1	1	7/24/97	8/4/97	ND	
Toxaphene	EPA 3550A	8080A	30	5	1	7/24/97	8/5/97	ND	
Chlordane	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1016	EPA 3550A	8080A	10	4	1	7/24/97	8/5/97	ND	
Aroclor 1221	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1232	EPA 3550A	8080A	10	8	1	7/24/97	8/5/97	ND	
Aroclor 1242	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1248	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	
Aroclor 1254	EPA 3550A	8080A	10	2	1	7/24/97	8/5/97	ND	
Aroclor 1260	EPA 3550A	8080A	10	3	1	7/24/97	8/5/97	ND	

Approved By: _____ Date: 8/8/97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-18A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-008	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	230	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	170	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	10	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	148	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	85	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	133	
nthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	331	
acene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	61	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	217	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	215	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	74	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	90	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	63	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	58	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	81	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	55	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	11	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	56	

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Approved By: DA Date: 8-20-97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-19A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-007	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
nthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	ND	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	0.7	J
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	0.9	J
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	0.5	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	0.7	J

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Approved By: DMA Date: 8-20-97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-24A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-010	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	129	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	82	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	27	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	104	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	17	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	77	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	540	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	111	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	480	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	669	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	166	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	210	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	130	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	129	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	218	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	179	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	21	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	190	

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Approved By: DM Date: 8·20·97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name: WR-GC-24B
Lab Code: K9705146-011
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	0.6	J
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	0.6	J
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	0.2	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	ND	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	0.6	J
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	0.8	J
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	0.8	J

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Approved By: DMA Date: 8·20·97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-30A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-001	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	19	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	39	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/5/97	7	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	8	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	6	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	11	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	68	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	17	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	96	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	87	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	46	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	53	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	34	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	34	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	43	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	35	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	8	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	34	

Approved By: _____ Date: 8·20·97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-31A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-013	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	16	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	8	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	5	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	7	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	7	
Phenanthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	44	
Anthracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	9	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	57	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	53	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	21	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	28	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	16	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	18	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	22	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	17	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	4	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	17	

Approved By: DWA Date: 8-20-97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-32A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-003	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	11	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	12	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	2	J
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	6	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	8	
nthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	45	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	9	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	58	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	51	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	27	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	32	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	25	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	21	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	26	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	19	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	19	

Approved By: DMA Date: 8-20-97

1S22/022897a

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97

Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-33A	Units:	ug/Kg (ppb)
Lab Code:	K9705146-005	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	24	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	42	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/6/97	7	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	9	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	8	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	14	
nthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	73	
racene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	15	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	69	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	81	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	28	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	42	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/6/97	22	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/6/97	18	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	25	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/6/97	18	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/6/97	5	J
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/6/97	21	

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Approved By: DMA Date: 8-20-97

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	Units:	ug/Kg (ppb)
Lab Code:	KWG9702022-4	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Naphthalene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	ND	
2-Methylnaphthalene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Acenaphthylene	EPA 3545	SIM	5	0.2	1	7/29/97	8/5/97	ND	
Acenaphthene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Dibenzofuran	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Fluorene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
anthrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
ıracene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Pyrene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
Benz(a)anthracene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	ND	
Chrysene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Benzo(b)fluoranthene	EPA 3545	SIM	5	0.8	1	7/29/97	8/5/97	ND	
Benzo(k)fluoranthene	EPA 3545	SIM	5	0.6	1	7/29/97	8/5/97	ND	
Benzo(a)pyrene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Indeno(1,2,3-cd)pyrene	EPA 3545	SIM	5	0.7	1	7/29/97	8/5/97	ND	
Dibenz(a,h)anthracene	EPA 3545	SIM	5	0.5	1	7/29/97	8/5/97	ND	
Benzo(g,h,i)perylene	EPA 3545	SIM	5	0.4	1	7/29/97	8/5/97	ND	

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Approved By: DM Date: 8-20-97

1S22/022897a

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97

Duplicate Summary
Total Solids (%)

Prep Method: NONE
Analysis Method: 160.3 M
Test Notes:

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Date Analyzed	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
WR-GC-30A	K9705146-001	7/23/97	57.3	57.3	57.3	<1	

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Approved By: _____ Date: 8/22/97

Total Solids/060595

05146ICP.AG2 - TS DUP 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97
Date Extracted: NA
Date Analyzed: 8/4/97

Duplicate Summary
Carbon, Total Organic

Sample Name: WR-GC-30A
Lab Code: K9705146-001DUP
Test Notes:

Units: PERCENT
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	1.80	1.73	1.76	4	

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Approved By: _____ Date: 8/22/97

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DUP/020597p
05146WET.LJ2 - DUP 8/21/97

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97
		Date Extracted:	NA
		Date Analyzed:	8/4/97

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	WR-GC-30A	Units:	PERCENT
Lab Code:	K9705146-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Carbon, Total Organic	NONE	ASTM D4129-82M	0.05	3.13	1.80	4.84	97	75-125	

Approved By: _____ Date: 8/22/97 00036

MS/020597p
05146WET.LJ2 - MS 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97
Date Extracted: NA
Date Analyzed: 8/4/97

Duplicate Summary
Sulfide, Acid-Volatile

Sample Name: WR-GC-30A
Lab Code: K9705146-001DUP
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.7	23	23	23	< 1	

Approved By: _____ Date: 8/8/97

DUP/020597p
05146WET.LJ1 - DUP 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97
		Date Extracted:	NA
		Date Analyzed:	8/4/97

Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name:	WR-GC-30A	Units:	mg/Kg (ppm)
Lab Code:	K9705146-001MS	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Sulfide, Acid-Volatile	NONE	Draft Aug 91	0.7	9.0	23	27	44	75-125	DR

Approved By: _____ Date: 8/22/97

00038

MS/020597p
05146WET.LJ1 - MS 8/21/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: NA
Date Received: NA
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Duplicate Summary
Total Metals

Sample Name: Batch QC
Lab Code: K9705278-001
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Arsenic	3050A	200.8	0.5	2.1	2.8	2.4	29	
Cadmium	3050A	200.8	0.02	0.30	0.25	0.28	18	
Chromium	3050A	200.8	0.5	26.2	24.2	25.2	8	
Copper	3050A	200.8	0.1	27.7	27.0	27.4	3	
Lead	3050A	200.8	0.02	32.2	27.6	27.1	17	
Mercury	7471A	7471A	0.05	0.09	0.11	0.010	20	
Nickel	3050A	200.8	0.5	20.0	18.7	19.4	7	
Silver	3050A	200.8	0.02	0.27	0.19	0.23	35	
Zinc	3050A	200.8	0.5	171	168	170	3	

Approved By: _____ Date: 8/22/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/J5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: NA
Date Received: NA
Date Extracted: 7/30/97
Date Analyzed: 7/31/97

Matrix Spike Summary
Total Metals

Sample Name: Batch QC
Lab Code: K9705278-001
Test Notes:

Units: mg/Kg (ppm)
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic	3050A	200.8	0.5	17	2.1	16.3	84	75-125	
Cadmium	3050A	200.8	0.02	4.2	0.30	3.90	86	75-125	
Chromium	3050A	200.8	0.5	17	26.2	40.5	84	75-125	
Copper	3050A	200.8	0.1	21	27.7	49.0	101	75-125	
Lead	3050A	200.8	0.02	42	32.2	73.3	98	75-125	
Mercury	7471A	7471A	0.05	0.47	0.09	0.55	98	75-125	
Nickel	3050A	200.8	0.5	42	20.0	54.3	82	75-125	
Silver	3050A	200.8	0.02	4.2	0.27	3.80	84	75-125	
Zinc	3050A	200.8	0.5	42	171	204	79	75-125	

Approved By: _____ Date: 8/22/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/J5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/30/97
		Date Analyzed:	7/31/97

Laboratory Control Sample Summary
Total Metals

Sample Name:	Laboratory Control Sample	Units:	mg/Kg (ppm)
Lab Code:	K9705146-LCS	Basis:	Dry
Test Notes:			

Source: Environmental Resource Associates

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Control Limits	Result Notes
Arsenic	3050A	200.8	62.7	59.1	94	70-130	
Cadmium	3050A	200.8	77.4	70.2	91	66-133	
Chromium	3050A	200.8	76.9	81.6	106	77-123	
Copper	3050A	200.8	58.2	55.0	95	79-121	
Lead	3050A	200.8	122	120	98	68-131	
Mercury	7471A	7471A	2.51	2.31	92	64-136	
Nickel	3050A	200.8	163	155	95	75-125	
Silver	3050A	200.8	69.6	69.1	99	74-126	
Zinc	3050A	200.8	114	113	99	74-126	

Approved By: _____ Date: 8/22/97 00041

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97
		Date Extracted:	7/24/97
		Date Analyzed:	8/4,5/97

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Prep Method:	EPA 3550A	Units:	PERCENT
Analysis Method:	8080A	Basis:	NA

Sample Name	Lab Code	Test Notes	Percent Recovery Tetrachloro-m-xylene	Percent Recovery Decachlorobiphenyl
WR-GC-30A	K9705146-001		52	67
WR-GC-32A	K9705146-003		47	57
WR-GC-33A	K9705146-005		58	63
WR-GC-19A	K9705146-007		52	68
WR-GC-18A	K9705146-008		55	67
WR-GC-24A	K9705146-010		50	59
WR-GC-24B	K9705146-011		53	75
WR-GC-31A	K9705146-013		54	66
WR-GC-24B	K9705146-011MS		61	69
WR-GC-24B	K9705146-011DMS		59	74
Lab Control Sample	K970724-SL		73	90
Method Blank	K970724-SB		8 CI	81

CAS Acceptance Limits:	20-107	20-142

Approved By: _____ Date: 8/8/97

00042

SUR2/052595
05146SVG.JS1 - SUR2 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deeping/5672	**Date Collected:**	7/22/97
Sample Matrix:	Sediment	**Date Received:**	7/23/97
		Date Extracted:	7/24/97
		Date Analyzed:	8/5/97

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name:	WR-GC-24B		Units: ug/Kg (ppb)
Lab Code:	K9705146-011MS,	K9705146-011DMS	Basis: Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	2	13	13	ND	8	9	62	69	20-141	12	
Heptachlor	EPA 3550A	8080A	2	13	13	ND	9	9	69	69	20-108	<1	
Aldrin	EPA 3550A	8080A	2	13	13	ND	8	8	62	62	20-181	<1	
Dieldrin	EPA 3550A	8080A	2	13	13	ND	9	10	69	77	20-183	11	
Endrin	EPA 3550A	8080A	2	13	13	ND	9	10	69	77	20-164	11	
4,4'-DDT	EPA 3550A	8080A	2	13	13	2	7	9	38	54	20-185	25	

Approved By: _____ Date: 8/8/97

DM

00043

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deeping/5672
LCS Matrix: Sediment

Service Request: K9705146
Date Collected: NA
Date Received: NA
Date Extracted: 7/24/97
Date Analyzed: 8/4/97

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

Sample Name: Lab Control Sample
Lab Code: K970724-SL
Test Notes:

Units: ug/Kg (ppb)
Basis: Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
gamma-BHC (Lindane)	EPA 3550A	8080A	13	11	85	21-123	
Heptachlor	EPA 3550A	8080A	13	11	85	31-112	
Aldrin	EPA 3550A	8080A	13	10	77	26-127	
Dieldrin	EPA 3550A	8080A	13	12	92	20-161	
Endrin	EPA 3550A	8080A	13	12	92	32-135	
4,4'-DDT	EPA 3550A	8080A	13	12	92	30-146	

Approved By: _____ Date: 8/8/97

00044

LCS/52595
05146SVG.JS1 - LCS 8/8/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Hart Crowser, Inc.
Project: Channel Deepening/5672
Sample Matrix: Sediment

Service Request: K9705146
Date Collected: 7/22/97
Date Received: 7/23/97
Date Extracted: 7/29/97
Date Analyzed: 8/5 - 8/6/97

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Prep Method: EPA 3545
Analysis Method: SIM

Units: Percent
Basis: Dry

Sample Name	Lab Code	Test Notes	Percent Recovery Fluorene-d10	Fluoranthene-d10	Terphenyl-d14
WR-GC-30A	K9705146-001		44	54	43
WR-GC-32A	K9705146-003		30	34	30
WR-GC-33A	K9705146-005		33	47	42
WR-GC-19A	K9705146-007		23	39	41
WR-GC-18A	K9705146-008		35	44	37
WR-GC-24A	K9705146-010		44	53	44
WR-GC-24B	K9705146-011		23	42	39
WR-GC-31A	K9705146-013		34	50	41
WR-GC-30A	K9705146-001MS		46	53	47
V [illegible]30A	K9705146-001DMS		47	59	48
L[illegible]trol Sample	KWG9702022-3		41	49	42
Method Blank	KWG9702022-4		35	49	52
CAS Acceptance Limits:			13-142	13-142	15-145

Approved By: DMA Date: 8-20-97

00045

SUR3/050897a
05146SVM.WN1 - SUR 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	Service Request:	K9705146
Project:	Channel Deepening/5672	Date Collected:	7/22/97
Sample Matrix:	Sediment	Date Received:	7/23/97
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-30A		Units:	ug/Kg (ppb)
Lab Code:	K9705146-001MS	K9705146-001DMS	Basis:	Dry
Test Notes:				

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Acenaphthene	EPA 3545	SIM	5	470	410	8	173	122	35	28	12-133	22	
Pyrene	EPA 3545	SIM	5	470	410	87	307	238	47	37	10-160	24	
Benzo(a)pyrene	EPA 3545	SIM	5	470	410	43	251	201	44	39	10-160	12	

Approved By: DMA Date: 8-20-97

00046

DMS/031497a

05146SVM.WN1 - DMS 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	Service Request:	K9705146
Project:	Channel Deepening/5672	Date Collected:	7/22/97
Sample Matrix:	Sediment	Date Received:	7/23/97
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	WR-GC-30A		Units:	ug/Kg (ppb)
Lab Code:	K9705146-001MS	K9705146-001DMS	Basis:	Dry
Test Notes:				

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Acenaphthene	EPA 3545	SIM	5	470	410	8	173	122	35	28	12-133	22	
Pyrene	EPA 3545	SIM	5	470	410	87	307	238	47	37	10-160	24	
Benzo(a)pyrene	EPA 3545	SIM	5	470	410	43	251	201	44	39	10-160	12	

Approved By: DMA Date: 8-20-97

00046

DMS/031497a
05146SVM.WN1 - DMS 8/19/97

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Hart Crowser, Inc.	**Service Request:**	K9705146
Project:	Channel Deepening/5672	**Date Collected:**	NA
LCS Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	7/29/97
		Date Analyzed:	8/5/97

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	Units:	ug/Kg (ppb)
Lab Code:	KWG9702022-3	Basis:	Dry
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Acenaphthene	EPA 3545	SIM	83	30	36	36-119	
Pyrene	EPA 3545	SIM	83	38	46	37-137	
Benzo(a)pyrene	EPA 3545	SIM	83	40	48	24-137	

Approved By: DM Date: 8·20·97 00047

LCS/031497a
05146SVM.WN1 - LCS 8/19/97

APPENDIX B

CHAIN OF CUSTODY INFORMATION

Columbia Analytical Services INC.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

DATE 7/22/97 PAGE 1 OF

PROJECT NAME Channel Dredging # 5672

PROJECT MANAGER Taku Fuji

COMPANY/ADDRESS Hart Crowser, Inc.
1910 Fairview Ave. E.
Seattle, WA PHONE 206-324-9530

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA418.1 ☐ OR/418.1 ☐ WA418.1 ☐	TPH/Gas/BTEX Gas ☐ BTEX ☐ 5030/8015/8020	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID WA/HCID ☐ OR/HCID ☐	TCLP Metals ☐ VOA ☐ Semi VOA ☐ Pest/Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-30 A	7/22/97	PM	5146-1	Sediment	5		✓		✓						✓							
WR-GC-30 Z	7/22/97	PM	2	"	1																	
WR-GC-32 A	7/22/97	PM	3	"	5		✓		✓						✓							
WR-GC-32 Z	7/22/97	PM	4	"	1																	

RELINQUISHED BY:
Signature
Grant W. Kuechler
Printed Name
Hart Crowser, Inc.
Firm
7/22/97 1830
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm 7/22/97 1836
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: 1970 5146

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 6[illegible] [illegible]222 • FAX (360) 636-1068

DATE 7/22/97 PAGE 1 OF

PROJECT NAME Channel Deepening # 5672

PROJECT MANAGER Taku Fujii

COMPANY/ADDRESS Hart Crowser, Inc.
1910 Fairview Ave. E.
Seattle, WA

PHONE 206-324-9530

SAMPLERS SIGNATURE [signature]

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons EPA/418.1 ☐ OR/418.1 ☐ WA/418.1 ☐	TPH/Gas/BTEX Gas ☐ BTEX ☐ 5030/8015/8020	TPH/8015 Modified Diesel ☐ Hydrocarbon Scan ☐	TPH/HCID ☐ OR/HCID ☐ WA/HCID ☐	TCLP Metals ☐ VOA ☐ Semi VOA ☐ Pest/Herb ☐	Metals (total or dissolved) List Below	Cyanide	pH, Cond, Cl, SO_4, PO_4, F, Br NO_2, NO_3, (circle)	NH_3-N, COD, Total-P, TKN, TOC (circle)	Total Organic Halides (TOX) 9020 ☐ (AOX) 1650A ☐			REMARKS
WR-GC-33A	7/22/97	AM	5146.5	Sediment	5		/															
WR-GC-33Z	"	"	6	"	5																	
WR-GC-19A	"	"	7	"	5		/															
WR-GC-18A	"	"	8	"	5		/															
WR-GC-18Z	"	"	9	"	1																	
WR-GC-24A	"	"	10	"	5		/															
WR-GC-24B	"	"	11	"	5		/															
WR-GC-24Z	"	"	12	"	1																	
WR-GC-31A	"	PM	13	"	5		/															
WR-GC-31Z	"	PM		"	1																	

RELINQUISHED BY:
Signature [signature]
Printed Name Grant W. Kuechtel
Firm Hart Crowser, Inc.
Date/Time 7/22/97 1835

RECEIVED BY:
Signature [signature]
Printed Name [signature]
Firm 7/22/97 1836
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date ___

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O.# ___
Bill To ___

SAMPLE RECEIPT:
Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: K9705146

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
All samples to be analyzed for parameters listed in sampling plan as per. Taku Fujii 7/23/97
Archive "Z" samples

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client CHANNEL DEEPENING Work Order K97 _____.

Cooler received on 7/23 and opened on 7/23 by VAO

1.	Were custody seals on outside of cooler?	YES NO
	If yes, how many and where? 1-FRONT / 1-SIDE	
2.	Were signature & date correct?	YES NO
3.	Were custody papers properly filled out (ink, signed, etc)?	YES NO
4.	Did all bottles arrive in good condition (unbroken)?	YES NO
5.	Were all bottle labels complete (*i.e.* analysis, preservation, etc)?	YES NO
6.	Did all bottle labels and tags agree with custody papers?	YES NO
7.	Were correct bottles used for the tests indicated?	YES NO
8.	Were VOA vials checked for absence of air bubbles, and noted if so?	YES NO
9.	Did the bottles originate from CAS/Kelso or a branch laboratory?	YES NO

10. Chain-of-custody identification number:					
Temperature of cooler(s) upon receipt:	7.6°	8.9°	8.0°		
Temperature Blank:					
Is the temperature within 4 ± 2° C?:	Yes ☐ No ☒	Yes ☐ No ☒	Yes ☐ No ☒	Yes ☐ No ☐	Yes ☐ No ☐

Explain any discrepancies _____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					

YES = All samples OK
NO = Samples were preserved at lab as listed

VOC Vial pH Verification (Tested after Analysis) ☐ All Samples pH ≤ 2 ☐ Following Samples Exhibited pH > 2			Samples received outside of temperature range	Sample I.D.
				00051

rvice Request #: 5146

Method: 160.3 M / EPA 160.4

alysis For: Total Solids / Total Volatile Solids

Extr/Analysis Lot
MET9703076

Sample Number	Wet Weight (g)	Tare Weight (g)	Tare + Dry Sample (g)	Dry Weight (g)	Tare + Ash Weight (g)	Ash Weight (g)	% Total Solids	% Volatile Solids
5146-1	15.83	1.35	10.42	9.07	9.84	8.49	57.3	6.39
-1d	16.31	1.34	10.69	9.35	10.08	8.74	57.3	6.52
-3	14.16	1.36	9.92	8.56	9.42	8.06	60.5	5.84
-5	12.75	1.33	8.94	7.61	8.49	7.16	59.7	5.91
-7	12.31	1.29	10.88	9.59	10.73	9.44	77.9	1.56
-8	19.08	1.35	11.38	10.03	10.60	9.25	52.6	7.78
-10	17.50	1.28	11.94	10.66	11.29	10.01	60.9	~~6.06~~
-11	14.59	1.34	13.22	11.88	13.00	11.66	81.4	1.85
-13	18.97	1.29	12.90	11.61	12.20	10.91	61.2	6.03

Total Solids = (Dry Weight / Wet Weight) x 100

% Total Volatile Solids = (1 - (Ash Weight/Dry Weight)) x 100

mments:

a. Amy Gowan Date: 7-23-97

viewed By: [illegible] Date: 7/25/97

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