Tables

Table 3-1 I&J Waterway Dredging Coring Plan

DMMU [1]	Dredge Prism: Approximate Dredge Volume (cy)	Dredge Prism: Approximate Dredge Surface Area (sq. yd)	Proposed Sediment Core ID	Core Section Designations and Depths	Length of Sediment Cores [1]	WGS [3]: Latitude	WGS [3]: Longitude	NAD 83 [4]: Easting	NAD 83 [4]: Northing	Compositing Scheme [5]: Surface Sediment Composite ID	Compositing Scheme [5]: Subsurface Sediment Composite	Compositing Scheme [5]: z-sample ID
1	3,140	3,010	IJ-10*	A -16.0 to -20.0	5	48.76606909	121.0027696	1599551	644281.8	IJ-C1-S1	-	IJ-C8-Z
				Z -20.0 to -21.0							-	
			IJ-11	A -17.0 to -20.0	4	48.76597492	121.0026361	1599583	644247.4		-	
				Z -20.0 to -21.0							-	
			IJ-12	A -17.0 to -20.0	4	48.76641596	121.002231	1599681	644408.1		-	
				Z -20.0 to -21.0							-	
			IJ-13	A -17.5 to -20.0	3.5	48.76632611	121.0021027	1599712	644375.2		-	
				Z -20.0 to -21.0							-	
2	3,120	3,120	IJ-14	A -17.0 to -20.0	4	48.76591002	121.0025185	1599611	644223.6	IJ-C2-S1	-	IJ-C9-Z
				Z -20.0 to -21.0							-	
			IJ-15	A -15.0 to -18.0	4	48.76592568	121.002187	1599691	644229.2		-	
				Z -18.0 to -19.0							-	
			IJ-16*	A -15.0 to -18.0	4	48.76573708	121.0022297	1599681	644160.4		-	
				Z -18.0 to -19.0							-	
			IJ-17	A -10.0 to -13.0	4	48.76573695	121.00249	1599618	644160.5		-	
				Z -13.0 to -14.0							-	
3	3,650	3,020	IJ-18	A -17.0 to -20.0	4	48.76652813	121.0019054	1599759	644448.8	IJ-C3-S1	-	IJ-C10-Z
				Z -20.0 to -21.0							-	
			IJ-19*	A -15.0 to -19.0	5	48.76682052	121.0016769	1599815	644555.4		-	
				Z -19.0 to -20.0							-	
			IJ-20	A -16.0 to -20.0	5	48.7669563	121.0012282	1599923	644604.7		-	
				Z -20.0 to -21.0							-	
			IJ-21	A -16.5 to -20.0	4.5	48.76670102	121.0014853	1599861	644511.7		-	
				Z -20.0 to -21.0							-	
4 [2]	3580 (surface) 2240 (subsurface)	3,580	IJ-30	A -15.0 to -18.0	6	48.76712529	121.0009695	1599986	644666.2	IJ-C4-S1	IJ-C5-S2 [6]	IJ-C11-Z
				B -18.0 to -20.0								
				Z -20.0 to -21.0								
			IJ-31	A -16.0 to -19.0	5	48.76726796	121.0007749	1600033	644718.2			
				B -19.0 to -20.0								
				Z -20.0 to -21.0								
			IJ-32*	A -1.5 to -4.5	5.5	48.76729717	121.0004748	1600105	644728.7			
				B -4.5 to -6.0								
				Z -6.0 to -7.0								
			IJ-33	A -9.0 to -12.0	7	48.76709502	121.0005005	1600099	644654.9			
				B -12.0 to -15.0								
				Z -15.0 to -16.0								
5	3,760	3,010	IJ-22*	A -16.5 to -20.0	4.5	48.76611901	121.0020832	1599716	644299.7	IJ-C6-S1	-	IJ-C12-Z
				Z -20.0 to -21.0							-	
			IJ-23	A -16.5 to -20.0	4.5	48.76639898	121.0016394	1599824	644401.6		-	
				Z -20.0 to -21.0							-	
			IJ-24	A -16.0 to -20.0	5	48.76668249	121.0013756	1599887	644504.9		-	
				Z -20.0 to -21.0							-	
			IJ-25*	A -16 to -20.0	5	48.76689979	121.0010149	1599975	644584		-	
				Z -20.0 to -21.0							-	
6	2,540	2,540	IJ-26*	A -14.0 to -18.0	5	48.76605603	121.0019873	1599739	644276.6	IJ-C7-S1	-	IJ-C13-Z
				Z -18.0 to -19.0							-	
			IJ-27	A -15.0 to -19.0	5	48.7663514	121.0016007	1599833	644384.2		-	
				Z -19.0 to -20.0							-	
			IJ-28	A -7.0 to -9.0	3	48.7665834	121.0011115	1599951	644468.6		-	
				Z -9.0 to -10.0							-	
			IJ-29	A -10.0 to -12.0	3	48.7668507	121.0008110	1600024	644566		-	
				Z -12.0 to -13.0							-	
Total	**22,030**	**18,280**										

Notes:

[1] DMMUs 1, 2, and 4 are contingent on surface sediment sampling results conducted as part of the I&J Waterway RI/FS.

[2] DMMU 4 is composed of a surface unit and a subsurface unit. DMMU-4A is the surface unit composited from cores IJ-30A, IJ-31A, IJ-32A, and IJ-33A. DMMU-4B is the subsurface unit composited from cores IJ-30B, IJ-31B, IJ-32B, and IJ-33B.

[3] World Geodetic System, 1984 (datum NAD 83)

[4] North American Datum of 1983, Washington State Plane North

[5] Surface cores (labelled A) will be composited into the S-1 sample. Subsurface cores (labelled B) will be composited into the S-2 sample. Z-samples will be archived for chemistry analysis

[6] Cores IJ-30B, IJ-31B, IJ-32B, and IJ-33B will be composited into sample IJ-C5-S2.

* Randomly selected for sulfide and volatile subsampling

Table 3-2 Sample Collection Requirements

DMMU	Sediment Composite ID [1]	Analysis											
		Total Sulfide[2]	Volatile Organics[2]	Total Solids, Total Volatile Solids, Total Organic Carbon, Ammonia	SVOCs	Pesticides/ PCBs	Metals	Bulk Butyl tin	Butyl tin porewater	Grain size	Archived Chemistry Sample	Bioassay	Bioac-cumulation
1	IJ-C1-S1	IJ-10	IJ-10	X	X	X	X	X	X	X	X	X	X
2	IJ-C2-S1	IJ-16	IJ-16	X	X	X	X	X	X	X	X	X	X
3	IJ-C3-S1	IJ-19	IJ-19	X	X	X	X	X	X	X	X	X	X
4A	IJ-C4-S1	IJ-32	IJ-32	X	X	X	X	X	X	X	X	X	X
4B	IJ-C5-S2	IJ-32	IJ-32	X	X	X	X	X	X	X	X	X	X
5	IJ-C6-S1	IJ-25	IJ-25	X	X	X	X	X	X	X	X	X	X
6	IJ-C7-S1	IJ-26	IJ-26	X	X	X	X	X	X	X	X	X	X
Samish Bay													
	REF-1	X		X						X		X	X
	REF-2	X		X						X		X	X

[1] Z samples will be archived with the potential for analysis of volatiles, SVOCs, pesticides/PCBs, and metals.
[2] Volatiles and sulfides are sampled prior to compositing from randomly selected cores.

Note: One MS/MSD sample will be collected for analysis of volatiles, SVOCs, pesticides/PCBs, and metals.

Table 3-3 PSDDA Sample Holding Times and Bottle Requirements

Analytical Parameter	Holding Time 4 °C	Holding Time -18 °C	Sample Bottle Size and Preservation
Total Solids, Total Volatile Solids, Total Organic Carbon	14 days [4]	6 months	4-oz. glass
Ammonia	7 days	NA [1]	
Total Sulfide	7 days dark	NA [1]	4-oz. glass w/ zinc acetate
Volatile Organics	14 days [4]	NA [1]	4-oz. glass w/ septa top
Semivolatile Organics	14 days [2, 4]	1 year [2]	16-oz. glass
Pesticides/PCBs	14 days [4]	NA [1]	8-oz. glass
Metals	6 months	2 years	4-oz. glass
Mercury	—	28 days	
Grain Size	6 months	not recommended [3]	16-oz. glass
Archive Sample (Chemistry)	—	1 year	8-oz. glass
Bioassay	8 weeks	NA	(2) - 2-liter plastic headspace free
Bioaccumulation	8 weeks	NA	20 1-L glass jars

Notes:

[1] Freezing samples will cause breakage of sample jar, which are completely filled with no headspace for these analyses.

[2] Holding time until extraction; extracts must be processed within 40 days.

[3] Samples must not be frozen or dried before analysis.

[4] Allen *et al.* (1991) recommended 14-day holding time at 4 °C.

Table 4-1 Sediment Chemical Analysis Methods, Target Detection Limits, and Criteria

Parameter	Preparation Method	Analysis Method	Target MDL [1]	SMS Criteria [2]		PSDDA Criteria [14]		
				SQS	MCUL	SL	BT	ML
Conventionals								
Total Solids (%)	--	PSEP [4a]	0.1	nv	nv	nv	nv	nv
Total Volatile Solids(%)	--	PSEP [4a]	0.1	nv	nv	nv	nv	nv
Total Organic Carbon (%)	--	PSEP [4b]	0.1	nv	nv	nv	nv	nv
Ammonia (mg/kg)	--	EPA 350.1 [5]	1	nv	nv	nv	nv	nv
Total Sulfides (mg/kg)	--	PSEP [4a]	10	nv	nv	nv	nv	nv
Grain Size (%)	--	PSEP [4a]	1	nv	nv	nv	nv	nv
Metals								
Antimony	Appendix D [4]	GFAA [6]	5	nv	nv	150	nv	200
Arsenic	Appendix D [4]	ICP [7]	5	57	93	57	507.1	700
Cadmium	Appendix D [4]	ICP [7]	0.2	5.1	6.7	5.1	11.3	14
Chromium	Appendix D [4]	ICP [7]	0.5	260	270	nv	267	nv
Copper	Appendix D [4]	ICP [7]	0.2	390	390	390	1,027	1,300
Lead	Appendix D [4]	ICP [7]	2	450	530	450	975	1,200
Mercury	MER [8]	7471 [8]	0.05	0.41	0.59	0.41	1.5	2.3
Nickel	Appendix D [4]	ICP [7]	0.01	nv	nv	140	370	370
Silver	Appendix D [4]	ICP [7]	0.3	6.1	6.1	6.1	6.1	8.4
Zinc	Appendix D [4]	ICP [7]	1.0	410	960	410	2,783	3,800
LPAH								
Naphthalene	3550 [9]	8270 [10]	0.02	99	170	2.1	nv	2.4
Acenaphthylene	3550 [9]	8270 [10]	0.02	66	66	0.56	nv	1.3
Acenaphthene	3550 [9]	8270 [10]	0.02	16	57	0.5	nv	2
Fluorene	3550 [9]	8270 [10]	0.02	23	79	0.54	nv	3.6
Phenanthrene	3550 [9]	8270 [10]	0.02	100	480	1.5	nv	21
Anthracene	3550 [9]	8270 [10]	0.02	220	1200	0.96	nv	13
2-Methylnaphthalene	3550 [9]	8270 [10]	0.02	38	64	0.67	nv	1.9
Total LPAH				370	780	5.2	nv	29
HPAH								
Fluoranthene	3550 [9]	8270 [10]	0.02	160	1200	1.7	4.6	30
Pyrene	3550 [9]	8270 [10]	0.02	1000	1400	2.6	11.98	16
Benzo(a)anthracene	3550 [9]	8270 [10]	0.02	110	270	1.3	nv	5.1
Chrysene	3550 [9]	8270 [10]	0.02	110	460	1.4	nv	21
Benzofluoranthenes	3550 [9]	8270 [10]	0.02	230	450	3.2	nv	9.9
Benzo(a)pyrene	3550 [9]	8270 [10]	0.02	99	210	1.6	nv	3.6
Indeno(1,2,3-cd)pyrene	3550 [9]	8270 [10]	0.02	34	34	0.6	nv	4.4
Dibenzo(a,h)anthracene	3550 [9]	8270 [10]	0.02	12	33	0.23	nv	1.9
Benzo(g,h,i)perylene	3550 [9]	8270 [10]	0.02	31	78	0.67	nv	3.2
Total HPAH				960	5300	12	nv	69
Chlorinated Hydrocarbons								
1,3-Dichlorobenzene	P&T [11]	8240 [11]	0.0032	nv	nv	0.17	1.241	nv
1,4-Dichlorobenzene	P&T [11]	8240 [11]	0.0032	3.1	9	0.11	nv	0.12
1,2-Dichlorobenzene	P&T [11]	8240 [11]	0.0032	2.3	2.3	0.035	nv	0.11
1,2,4-Trichlorobenzene	3550 [9]	8270 [10]	0.006	0.81	1.8	0.031	nv	0.064
Hexachlorobenzene	3550 [9]	8270 [10]	0.012	0.38	2.3	0.022	0.168	0.23
Phthalates								
Dimethyl phthalate	3550 [9]	8270 [10]	0.02	53	53	0.1	nv	1.4
Diethyl phthalate	3550 [9]	8270 [10]	0.02	61	110	0.2	nv	1.2
Di-n-butyl phthalate	3550 [9]	8270 [10]	0.02	220	1700	1.4	nv	5.1
Butyl benzyl phthalate	3550 [9]	8270 [10]	0.02	4.9	64	0.06	nv	0.97
Bis(2-ethylhexyl)phthalate	3550 [9]	8270 [10]	0.02	47	78	1.3	nv	8.3
Di-n-octyl phthalate	3550 [9]	8270 [10]	0.02	58	4500	6.2	nv	6.2
Phenols								
Phenol	3550 [9]	8270 [10]	0.020	0.42	1	0.42	nv	1.2
2-Methylphenol	3550 [9]	8270 [10]	0.020	0.063	0.063	0.063	nv	0.077
4-Methylphenol	3550 [9]	8270 [10]	0.020	0.67	0.67	0.67	nv	3.6
2,4-Dimethylphenol	3550 [9]	8270 [10]	0.020	0.029	0.029	0.029	nv	0.21
Pentachlorophenol	3550 [9]	8270 [10]	0.100	0.36	0.69	0.4	0.504	0.69
Miscellaneous Extractables								
Benzyl alcohol	3550 [9]	8270 [10]	0.020	0.057	0.073	0.057	nv	0.87
Benzoic acid	3550 [9]	8270 [10]	0.200	0.65	0.65	0.65	nv	0.76
Miscellaneous Extractables								
Dibenzofuran	3550 [9]	8270 [10]	0.020	15	58	0.54	nv	1.7
Hexachloroethane	3550 [9]	8270 [10]	0.020	nv	nv	1.4	nv	14
Hexachlorobutadiene	3550 [9]	8270 [10]	0.020	3.9	6.2	0.029	nv	0.27
N-Nitrosodiphenylamine	3550 [9]	8270 [10]	0.020	11	11	0.028	nv	0.13
Volatile Organics								
Trichloroethene	P&T [11]	8260 [12]	0.0032	nv	nv	0.16	nv	1.6
Tetrachlorethene	P&T [11]	8260 [12]	0.001	nv	nv	0.057	nv	0.21
Ethylbenzene	P&T [11]	8260 [12]	0.001	nv	nv	0.01	nv	0.05
Total xylenes	P&T [11]	8260 [12]	0.001	nv	nv	0.04	nv	0.16
Pesticides								
DDT	3550 [9]	8081 [13]	0.003	nv	nv	0.0069	0.05	0.069
Aldrin	3550 [9]	8081 [13]	0.0017	nv	nv	0.01	nv	nv
alpha-chlordane	3550 [9]	8081 [13]	0.0017	nv	nv	0.01	0.037	nv
dieldrin	3550 [9]	8081 [13]	0.0023	nv	nv	0.01	nv	nv
heptachlor	3550 [9]	8081 [13]	0.0017	nv	nv	0.01	nv	nv
alpha-BHC	3550 [9]	8081 [13]	0.0017	nv	nv	nv	0.01	nv
gamma-BHC (Lindane)	3550 [9]	8081 [13]	0.0017	nv	nv	0.01	nv	nv
Total PCBs	3550 [9]	8081 [13]	0.160	12	65	0.13	38	3.1

Notes:

1 Method detection limit (MDL) values - from Analytical Resources, Inc. (ARI) laboratory - expressed on a dry weight

Note that some SMS criteria are expressed as the carbon-normalized value (ppm TOC) - see note 2 below - direct comparison to the detection limits cannot be made without a TOC conversion factor.

2 Sediment Management Standards (SMS), includes Sediment Quality Levels (SQL) [low screen] and Maximum Chemical Criteria (MCUL) [high screen] expressed as mg/kg dw; The following are TOC normalized: LPAH, HPAH, Chlorinated hydrocarbons, phthalates, misc.extractables, and PCBs.

3 Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Organic Compounds in Puget Sound, 1996. TBT extraction method is Krone, 1988.

4a Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound, 1986.

4b Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound, 1996.

5 Plumb, 1981. EPA/U.S. Army Corps of Engineers procedures for measuring ammonia.

6 Graphite Furnace Atomic Absorption (GFAA) Spectrometry. SW-846. EPA, 1986.

7 Inductively Coupled Plasma (ICP) Emission Spectrometry. SW-846. EPA, 1986.

8 Mercury Digestion and Cold Vapor Atomic Absorption (CVAA) Spectrometry, Method 7471. SW-846. EPA 1986.

9 Sonication Extraction of Sample Solids, Method 3550 (Modified). SW-846. EPA, 1986. Method is modified to add matrix spikes before, rather than after, the dehydration step.

10 GCMS Capillary Column, Method 8270. SW-846. EPA, 1986.

11 Purge and Trap Extraction and GCMS Analysis, Method 8240. EPA, 1986.

12 Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Column Technique, Method 8260A. EPA, 1994.

13 Organochlorine Pesticides and PCBs as Arochlors by Gas Chromatography and Capillary Column Technique, Method 8081. EPA, 1994.

14 Puget Sound Dredged Disposal Analysis (PSDDA) criteria, includes Screening Level (SL), Bioaccumulation Trigger

Table 4-2 Minimum Laboratory QA/QC Requirements

Analysis Type	Total Possible Samples	Laboratory QA/QC				
		Method Blanks[1]	Repli-cates[2]	CRM[3]	Matrix Spike[1]	Surro-gates[4]
Volatile Organics[5, 6]	16	✓	✓[2]		✓	✓
Semivolatiles[5, 6]	16	✓	✓[2]	✓[7]	✓	✓
Pesticides/PCBs[5, 6]	16	✓	✓[2]	✓[7]	✓	✓
Metals	16	✓	✓	✓	✓	
Ammonia	16	✓	✓			
Total Sulfides	16	✓	✓			
Total Organic Carbon	16	✓	✓	✓		
Total Solids	16		✓			
Total Volatile Solids	16		✓			
Grain Size	16		✓			

Notes:

[1] Frequency of Analysis (FOA) = 5% or one per batch, whichever is more frequent

[2] Matrix spike duplicate will be run

[3] Certified Reference Material

[4] Surrogate spikes required for every sample, including matrix spiked samples, blanks, and reference materials

[5] Initial calibration required before any samples are analyzed, after each major disruption of equipment, and when ongoing calibration fails to meet criteria.

[6] Ongoing calibration required at the beginning of each work shift, every 10-12 samples, or every 12 hours (whichever is more frequent), and at the end of each shift.

[7] Sequim Bay Reference (one replicate)

Table 5-1 Proposed Bioassay Test Organisms for PSDDA Testing

DMMU	Surface Sediment Composite ID	Anticipated Grain Size [1]	Amphipod [2]	Larval Test		*Neanthes arenaceodentata*
			Eohaustorius estuarius	*Dendraster excentricus*	*Mytilus galloprovincialis*	
1	IJ-C1-S1	Silty sand	X	X [2]	(X) [3]	X
2	IJ-C2-S1	Silty sand	X	X [2]	(X) [3]	X
3	IJ-C3-S1	Clayey silt	X	X [2]	(X) [3]	X
4A	IJ-C4-S1	Silty sand	X	X [2]	(X) [3]	X
4B	IJ-C5-S2	Silty sand	X	X [2]	(X) [3]	X
5	IJ-C6-S1	Clayey silt	X	X [2]	(X) [3]	X
6	IJ-C7-S1	Sandy silt	X	X [2]	(X) [3]	X
Samish Bay						
	REF-1	Silty sand	X	X [2]	(X) [3]	X
	REF-2	Clayey silt	X	X [2]	(X) [3]	X

1 Grain size estimated from historical samples collected near the proposed coring locations.

2 If clays are greater than 30% and fines are greater than 60%, *Ampelisca abdita* will be used for the amphipod test. If clays are greater than 30% and fines are less than 60%, *Rhepoxynius abronius* will be used.

3 *Mytilus galloprovincialis* is the preferred species, but if spawning is unable to be induced, *Dendraster excentricus* will be used.

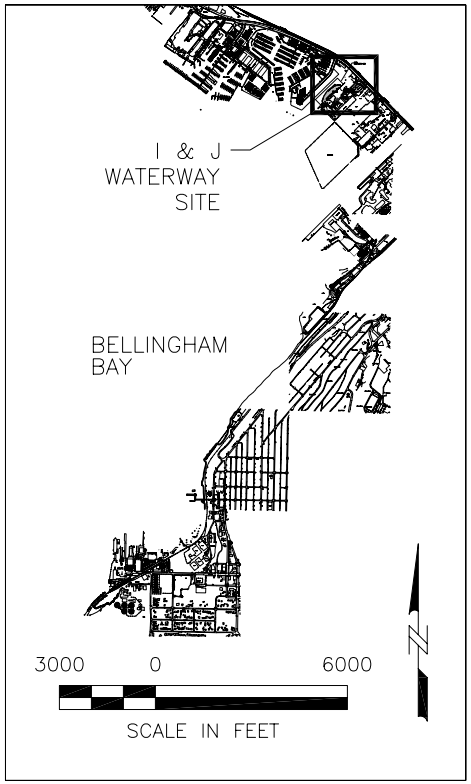
Table 5-2 PSDDA Bioassay Evaluation Guidelines

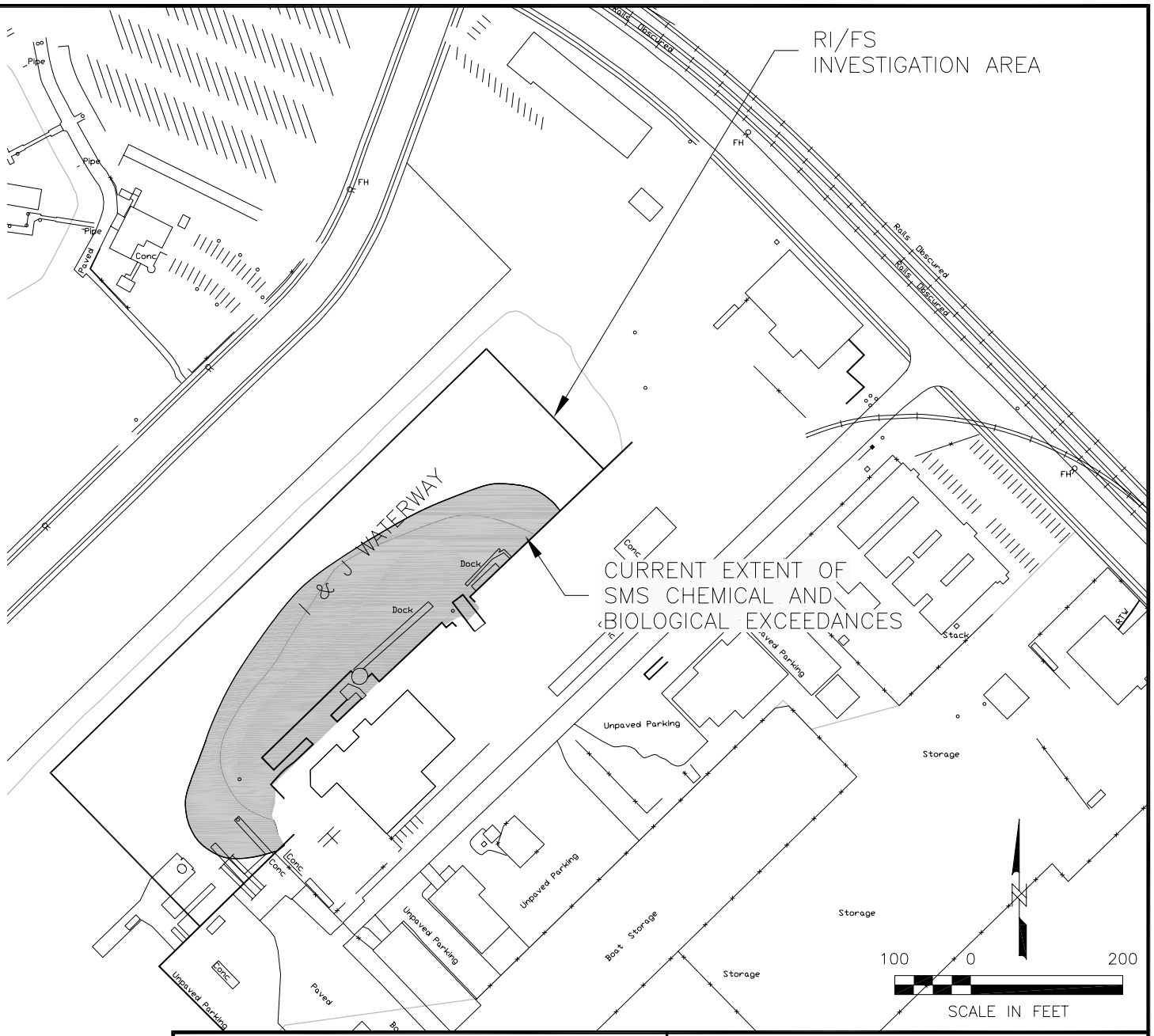
Bioassay	Negative Control Performance Standard	Reference Sediment Performance Standard	Dispersive Disposal Site Interpretation Guidelines		Nondispersive Disposal Site Interpretation Guidelines	
			1-hit Rule	2-hit Rule	1-hit Rule	2-hit Rule
Amphipod	$M_C \leq 10\%$	$M_R - M_C \leq 20\%$	$M_T - M_C > 20\%$ and M_T vs M_R SD ($p = 0.05$) and		$M_T - M_C > 20\%$ and M_T vs M_R SD ($p = 0.05$) and	
			$M_T - M_R > 10\%$	NOCN	$M_T - M_R > 30\%$	NOCN
Larval	$N_C \div I \geq 0.70$	$N_R \div N_C \geq 0.65$	$N_T \div N_C < 0.80$ and N_T/N_C vs N_R/N_C SD ($p = 0.10$) and		$N_T \div N_C < 0.80$ and N_T/N_C vs N_R/N_C SD ($p = 0.10$) and	
			$N_R/N_C - N_T/N_C > 0.15$	NOCN	$N_R/N_C - N_T/N_C > 0.30$	NOCN
Neanthes growth	$M_C \leq 10\%$ and MIGC ≥ 0.38	$M_R \leq 20\%$ and 'MIGR ÷ MIGC ≥ 0.80	$MIG_T \div MIG_C < 0.80$ and MIG_T vs MIG_R SD ($p = 0.05$) and		$MIG_T \div MIG_C < 0.80$ and MIG_T vs MIG_R SD ($p = 0.05$) and	
			$MIG_T/MIG_R < 0.70$	NOCN	$MIG_T/MIG_R < 0.50$	$MIG_T/MIG_R < 0.70$

Notes:
I - Initial count
M - Mortality
MIG - Mean individual growth rate
N - Normals
NOCN - No other conditions necessary
SD - Statistically different
Subscripts:
C - Negative control
R - Reference sediment
T - Test sediment

Figures

File: H:\18449\18449S002.dwg Layout: Layout1 User: astenberg Plotted: Jun 16, 2005 - 1:49pm Xref's: BAYTOTA, HARBTXT

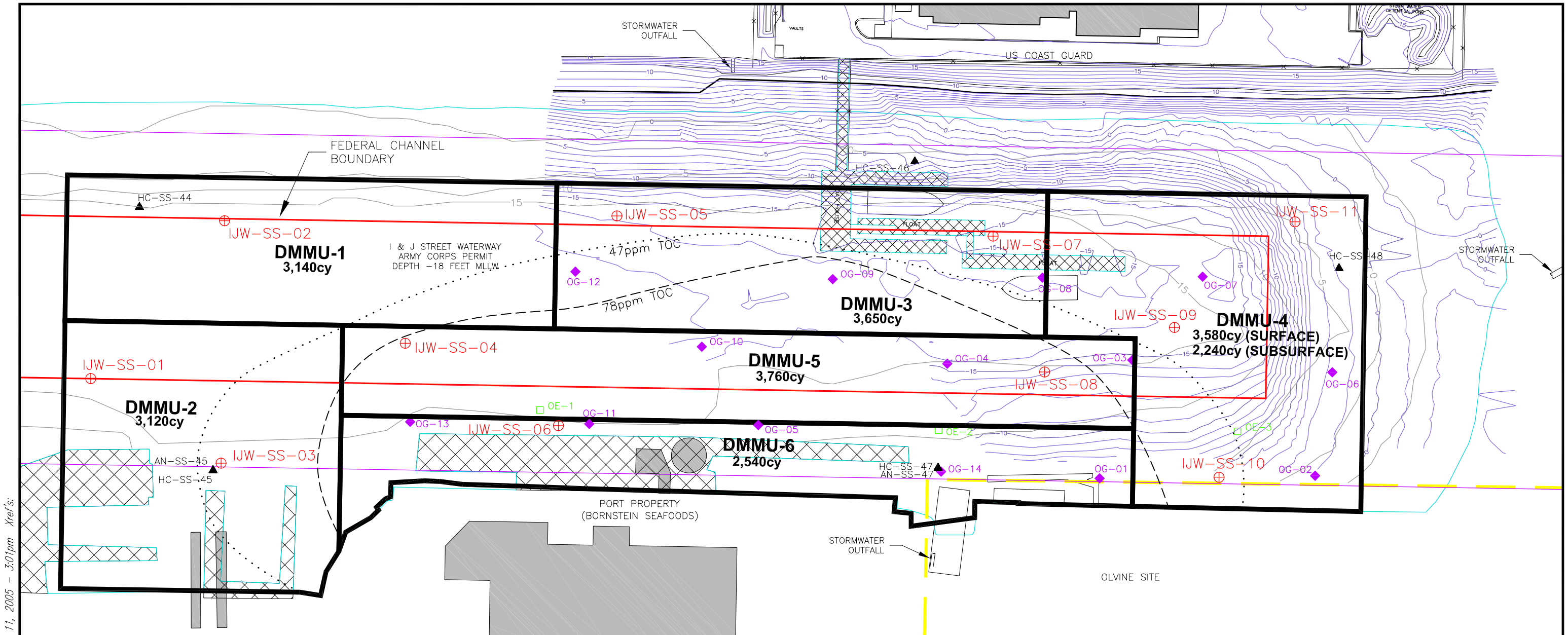




NOTE:
THE INVESTIGATION AREA MAY BE EXPANDED IF CONTAMINATION APPEARS TO EXTEND BEYOND THE CURRENT INVESTIGATION AREA.

RETEC

I&J WATERWAY RI/FS WORK PLAN PORTB-18449-100			SITE LOCATION MAP
DATE: 06/15/05	DRWN: A.S./SEA		FIGURE 1-1



LEGEND

- DOCKS OR PIERS
- EXISTING STRUCTURES
- EXISTING SHORELINE
- BATHYMETRY (25)
- CURRENT OLIVINE UPLAND SITE BOUNDARY
- I & J WATERWAY BOUNDARY

- ▲ HC-SS-47 — WHATCOM WATERWAY STATION SEDIMENT GRAB SAMPLE (HART CROWSER, 1997)
- ◆ OG-10 — 2001 RETEC STATION SURFACE SEDIMENT GRAB SAMPLE
- □ OE-1 — PRE-REMEDIAL DESIGN TESTING STATION (COMPOSITE FOR LEACHING TESTS 2002) (SAMPLE TO BE COLLECTED 0-3FT BELOW MUDLINE)
- ▲ AN-SS-47 — ANCHOR BIOASSAY SAMPLE LOCATION
- ⊕ IJW-SS-04 — PROPOSED RI/FS SAMPLE LOCATION

- bis(2-Ethylhexyl)phthalate EXCEEDS CHEMICAL SQS CRITERIA (47ppm TOC)
- bis(2-Ethylhexyl)phthalate EXCEEDS CHEMICAL MCUL CRITERIA (78ppm TOC)

NOTE:
EXCEEDENCES OF SQS BIOLOGICAL EFFECTS CRITERIA WERE PREVIOUSLY DETECTED AT STATION AN-SS-45. EXCEEDENCES OF MCUL BIOLOGICAL EFFECTS CRITERIA WERE PREVIOUSLY DETECTED AT STATION AN-SS-47.

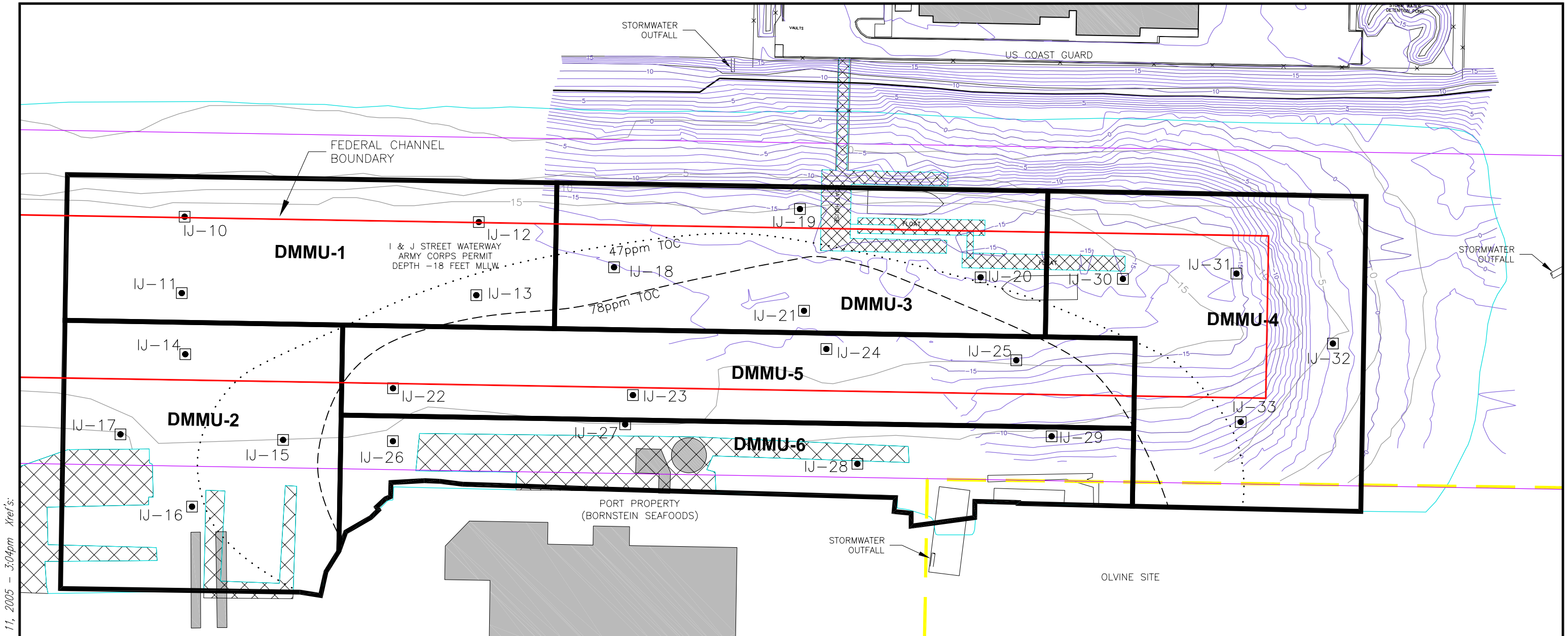
N

30 0 60
SCALE IN FEET

RETEC

I & J WATERWAY PSDDA SAMPLING AND ANALYSIS PLAN PORTB-18449-100			PROPOSED I & J WATERWAY DREDGING AREAS
DATE: 02/11/05	DRWN: A.S./SEA		FIGURE 1-2

File: H:\18449\18449S006.dwg Layout: Layout1 User: astenberg Plotted: Feb 11, 2005 - 3:01pm Xref's:



LEGEND

- DOCKS OR PIERS
- EXISTING STRUCTURES
- EXISTING SHORELINE
- BATHYMETRY
- CURRENT OLIVINE UPLAND SITE BOUNDARY
- I & J WATERWAY BOUNDARY
- IJ-27 SUBSURFACE CORE LOCATIONS
- bis(2-Ethylhexyl)phthalate EXCEEDS CHEMICAL SQS CRITERIA (47ppm TOC)
- bis(2-Ethylhexyl)phthalate EXCEEDS CHEMICAL MCUL CRITERIA (78ppm TOC)

NOTE:

EXCEEDENCES OF SQS BIOLOGICAL EFFECTS CRITERIA WERE PREVIOUSLY DETECTED AT STATION AN-SS-45. EXCEEDENCES OF MCUL BIOLOGICAL EFFECTS CRITERIA WERE PREVIOUSLY DETECTED AT STATION AN-SS-47.

30 0 60

SCALE IN FEET

RETEC

I & J WATERWAY PSDDA SAMPLING AND ANALYSIS PLAN PORTB-18449-100			PROPOSED I & J WATERWAY DMMU SAMPLING LOCATIONS
DATE: 02/11/05	DRWN: A.S./SEA		FIGURE 3-1

File: H:\18449\184495005.dwg Layout: Layout1 User: astenberg Plotted: Feb 11, 2005 - 3:04pm Xref's:

Attachment A

Summary of Historical Analytical Data

Table A-1 Summary of Valid Historical Analytical Data for Surface Sediments

Table A-2 Summary of Valid Historical Core Sampling Data

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Figure A-1 Summary of Previous Surface Sediment Exceedances

Table A-1 Summary of Valid Historical Analytical Data for Surface Sediments

Station Sampling Date			HC-SS-45 9/4/1996	HC-SS-46 9/5/1996	HC-SS-47 9/4/1996	HC-SS-48 9/5/1996	HC-SC-85 9/9/1996	AN-SS-84 10/27/1998	AN-SS-45 10/27/1998	AN-SS-47 10/27/1998
Datum			NAD-83	NAD-83	NAD-83	NAD-83	NAD-83	Corresponds approximately to HC-SC-84	Corresponds approximately to HC-SS-45	Corresponds approximately to HC-SS-47
Easting			1239793	1239963	1240107	1240194	1240186			
Northing			644131	644572	644449	644711	644711			
Sample Type			Surface Grab	Surface Grab	Surface Grab	Surface Grab	Surface Grab			
Reported elevation			-13.1 ft.	-7.0 ft.	-7.1 ft.	-2.3 ft.	-2.3 ft.	NT	NT	NT
Sampling Interval			0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Consultant	SMS Criteria		Hart Crowser	Hart Crowser	Hart Crowser	Hart Crowser	Hart Crowser	Anchor	Anchor	Anchor
Reference	SQS	MCUL	HC May 1997	HC May 1997	HC May 1997	HC May 1997	HC May 1997	Anchor, 1999	Anchor, 1999	Anchor, 1999
Conventionals										
Total Solids (%)	NV	NV	40	45	50	50	35	43.3	39.2	62.2
Total Organic Carbon (%)	NV	NV	3.4	2.6	4	0.82	3.1	2.6	2.8	4.2
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg dry)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Antimony	NV	NV	NT	NT	NT	NT	NT	NT	NT	NT
Arsenic	57	93	11 E	NT	9.2 E	3.2 E	9.6 E	NT	NT	NT
Cadmium	5.1	6.7	1.6	NT	1.3	< 0.59	1.3	1 U	1	0.7 J
Chromium	260	270	71	NT	49	17	66	NT	NT	NT
Copper	390	390	73	NT	51	16	61	NT	NT	NT
Lead	450	530	19	NT	24	11	20	NT	NT	NT
Mercury	0.41	0.59	0.36	0.36	0.29	< 0.13	0.45	0.45	0.41	0.17 J
Nickel	NV	NV	NT	NT	NT	NT	NT	NT	NT	NT
Silver	6.1	6.1	< 1.2	NT	< 1.0	< 0.59	< 1.3	NT	NT	NT
Zinc	410	960	130	NT	190	51	120	106	138	137
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	0.94 E	NT	4.00	6.83	0.68 E	1.4	3	3.3 U
Acenaphthene	16	57	0.47 E	NT	40.00	2.07 E	0.84 E	0.77 U	1.1	3.3 U
Acenaphthylene	66	66	< 1.12	NT	2.15	1.16 E	< 1.42	0.77 U	0.75	3.3 U
Anthracene	220	1,200	1.56	NT	35.00	5.98	1.16 E	1.6	6.1	4.3
Fluorene	23	79	0.94 E	NT	7.50	4.02	1.26 E	0.96	2.5	3.3 U
Naphthalene	99	170	1.53	NT	3.75	7.44	1.13 E	2	3.6	3.3 U
Phenanthrene	100	480	4.41	NT	30.00	24.39	7.74	3.8	10	11
Total LPAHs	562	780	8.91	NT	118.40	45.06	12.13	11	27	32
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	5.29	NT	42.50	18.29	4.52	2.4	13	12
Benzo(a)pyrene	99	210	3.24	NT	13.50	20.73	3.13	1.9	8.2	10
Benzo(b)fluoranthene	230	450	8.53 C	NT	35.0 C	20.73	4.52	2.5	14	17
Benzo(g,h,i)perylene	31	78	2.24 E	NT	5.75	19.51	2.26 E	1.3	3.1	4
Benzo(k)fluoranthene	230	450	8.53 C	NT	35.0 C	19.51	3.87	3	12	24
Chrysene	110	460	8.82	NT	47.50	29.27	8.06	3.8	19	31
Dibenz(a,h)anthracene	12	33	1.32 E	NT	3.75	9.27	1.0 E	0.77 U	1.8	3.3 U
Fluoranthene	160	1,200	10.29	NT	125.00	47.56	12.58	8.5	24	74
Indeno(1,2,3-cd)pyrene	34	88	2.24	NT	5.75	18.29	2.16 E	1.1	3.9	5.5
Pyrene	1,000	1,400	10.00	NT	117.50	47.56	12.58	9.2	54	100
Total HPAHs	2,016	5,300	51.97	NT	396.25	250.73	54.7	35.0	152.0	280.0
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	13.24	NT	700.00	25.61	7.1	4.6	50	476
Butylbenzylphthalate	4.9	64	0.59 E	NT	< 1.53	1.83 E	< 2.81	0.88	1.3	3.3 U
Diethylphthalate	61	110	< 2.94	NT	< 2.00	< 6.34	< 3.87	0.77 U	0.71 U	3.3 U
Dimethylphthalate	53	53	< 2.53	NT	0.73 E	< 5.37	< 3.16	0.77 U	0.82	3.3 U
Di-n-Butylphthalate	220	1,700	< 1.74	NT	< 1.18	1.34 E	< 2.16	1.3	0.71 U	18
Di-n-Octyl phthalate	58	4,500	< 2.12	NT	< 1.43	< 4.51	4.19	0.77 U	0.93 E	3.3 U
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Phenol	0.42	1.2	1.50	NT	0.46	0.07	0.026 E	0.039 U	0.040 U	0.280 UG
2,4-Dimethylphenol	0.029	0.029	0.014 E	NT	.016 E	0.010 E	0.0093 E	0.059 U	0.060 U	0.410 UG
2-Methylphenol	0.063	0.063	0.009 E	NT	0.011 E	0.0059 E	0.0068 E	0.039 U	0.040 U	0.280 UG
4-Methylphenol	0.67	0.67	0.22	NT	0.21	0.04	0.19	0.062	0.22	0.140 UG
Pentachlorophenol	0.36	0.69	0.015 E	NT	0.018 E	0.010 E	0.011 E	0.099 U	0.099 U	0.410 UG
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Benzyl Alcohol	0.057	0.073	< 0.0057 E	NT	< 0.0077 E	< 0.034	0.0064 E	0.099 U	0.099 U	0.690 U
Benzoic Acid	0.65	0.65	< 0.23 E	NT	< 0.29	< 0.089 E	< 0.19 E	0.2 U	0.20 U	1.4 UG
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 1.15	NT	< 0.78	< 2.44	< 1.42	0.77 U	0.71 U	3.3 U
1,2-Dichlorobenzene	2.3	2.3	< 1.35	NT	< 0.90	< 2.93	< 1.68	0.77 U	0.71 U	3.3 U
1,3-Dichlorobenzene	NV	NV	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	3.1	9	< 1.21	NT	< 0.83	< 2.56	< 1.52	0.77 U	0.71 U	3.3 U
Dibenzofuran	15	58	0.91 E	NT	4.50	4.88	0.94 E	1.4	3.6	3.3 U
Hexachlorobenzene	0.38	2.3	< 0.12	NT	< 0.08	< 0.27	< 0.15	0.77 U	0.71 U	3.3 U
Hexachlorobutadiene	3.9	6.2	< 0.12	NT	< 0.08	< 0.27	< 0.15	1.5 U	1.4 U	6.7 U
N-Nitrosodiphenylamine	11	11	< 1.5	NT	< 1.03	< 3.29	< 1.90	0.77 U	0.71 U	3.3 U
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
Aroclor 1016	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1221	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1232	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1242	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1248	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1254	12	65	< 3.82	NT	< 2.5	< 7.93	< 4.52	NT	NT	NT
Aroclor 1260	12	65	< 3.82	NT	3.25	< 7.93	< 4.52	NT	NT	NT
Total PCBs	12	65	< 3.82	NT	3.25	< 7.93	< 4.52	NT	NT	NT

NOTES:

Single underlined values exceed the SQS value.
Double underlined values exceed the MCUL value.
NV - No Value.
NA - Not Analyzed.
D - Indicates value reported in diluted sample.
E - Value above linear range of detector
M - indicates estimated value of analyte found and confirmed by analyst but with low spectral match.

Table A-2 Summary of Valid Historical Core Sampling Data

Station			HC-VC-85-S1	HC-SC-85-S2
Sampling Date			9/11/1996	9/11/1996
Datum			NAD-83	NAD-83
Easting			1240186	1240186
Northing			644634	644634
Sample Type			Vibracore	Vibracore
Reported elevation			-16.6 ft.	-16.6 ft.
Sampling Interval			0 to 4.5 ft.	4.7 to 7.1 ft.
Consultant	SMS Criteria		Hart Crowser	Hart Crowser
Reference	SQS	MCUL	HC May 1997	HC May 1997
Conventionals				
Total Solids (%)	NV	NV	**43**	**59**
Total Organic Carbon (%)	NV	NV	**4.2**	**13**
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Antimony	NV	NV	NT	NT
Arsenic	57	93	**9.9**	**4.7**
Cadmium	5.1	6.7	**1.4**	< 0.86
Chromium	260	270	**69**	**24**
Copper	390	390	**66**	**28**
Lead	450	530	**33**	**15**
Mercury	0.41	0.59	**0.88**	< 0.16
Nickel	NV	NV	NT	NT
Silver	6.1	6.1	< 1.2	< 0.86
Zinc	410	960	**130**	**54**
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**5.0 E**	**7.69 E**
Acenaphthene	16	57	**1.88 E**	**1.85 E**
Acenaphthylene	66	66	**0.81 E**	**1.31 E**
Anthracene	220	1,200	**3.33 E**	**2.15 E**
Fluorene	23	79	**2.86 E**	**3.0 E**
Naphthalene	99	170	**6.43 E**	**9.23 E**
Phenanthrene	100	480	**8.10 E**	**7.62 E**
Total LPAHs	562	780	**23.4**	**25.15**
HPAH	*(ppm TOC)*	*(ppm TOC)*		
Benzo(a)anthracene	110	270	**6.67 E**	**1.69 E**
Benzo(a)pyrene	99	210	**5.0 E**	**1.23 E**
Benzo(b)fluoranthene	230	450	**6.43 E**	**1.92 E**
Benzo(g,h,i)perylene	31	78	**5.48 E**	**0.75 E**
Benzo(k)fluoranthene	230	450	**5.71 E**	**1.92 E**
Chrysene	110	460	**10.24 E**	**2.08 E**
Dibenz(a,h)anthracene	12	33	**1.93 E**	< 0.40 E
Fluoranthene	160	1,200	**13.10 E**	**5.85 E**
Indeno(1,2,3-cd)pyrene	34	88	**4.29 E**	**0.58 E**
Pyrene	1,000	1,400	**20.48 E**	**3.31 E**
Total HPAHs	2,016	5,300	**79.3**	**17.42**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**50.0 E**	**< 1.23 E**
Butylbenzylphthalate	4.9	64	**1.71 E**	< 0.40 E
Diethylphthalate	61	110	< 2.21 E	**0.23 E**
Dimethylphthalate	53	53	**0.50 E**	**0.42 E**
Di-n-Butylphthalate	220	1,700	**0.86 E**	**0.15 E**
Di-n-Octyl phthalate	58	4,500	**2.62 E**	< 0.37 E
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Phenol	0.42	1.2	**0.28 E**	**0.37 E**
2,4-Dimethylphenol	0.029	0.029	**0.038 E**	**0.61 E**
2-Methylphenol	0.063	0.063	**0.023 E**	**0.40 E**
4-Methylphenol	0.67	0.67	**0.200 E**	**1.5 E**
Pentachlorophenol	0.36	0.69	**0.0098 E**	**0.028 E**
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
Benzyl Alcohol	0.057	0.073	**0.0048 E**	**0.0044 E**
Benzoic Acid	0.65	0.65	< 0.20 E	< 0.047 E
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.86 E	< 0.20 E
1,2-Dichlorobenzene	2.3	2.3	< 1.00 E	**0.05 E**
1,3-Dichlorobenzene	NV	NV	NA	NA
1,4-Dichlorobenzene	3.1	9	< 0.90 E	**0.08 E**
Dibenzofuran	15	58	**3.81 E**	**4.69 E**
Hexachlorobenzene	0.38	2.3	**0.17**	< 0.02
Hexachlorobutadiene	3.9	6.2	< 0.09	< 0.02
N-Nitrosodiphenylamine	11	11	**0.55 E**	**0.92 E**
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*	*(ppm TOC)*
Aroclor 1016	12	65	< 2.86	< 0.65
Aroclor 1221	12	65	< 2.86	< 0.65
Aroclor 1232	12	65	< 2.86	< 0.65
Aroclor 1242	12	65	< 2.86	< 0.65
Aroclor 1248	12	65	< 2.86	< 0.65
Aroclor 1254	12	65	< 2.86	< 0.65
Aroclor 1260	12	65	< 2.86	< 0.65
Total PCBs	12	65	< 2.86	< 0.65

NOTES:

Single underlined values exceed the SQS value.
Double underlined values exceed the MCUL value.
NV - No Value.
NA - Not Analyzed.
D - Indicates value reported in diluted sample.
E - Value above linear range of detector
M - indicates estimated value of analyte found and confirmed by analyst but with low spectral match.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-1 8/25/2000		OG-2 8/24/2000	
Conventionals						
Total Solids (%)	NV	NV	**64.4**		**76.2**	
Total Organic Carbon (%)	NV	NV	**2.0**		**1.6**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	**11.0**		**16.0**	
Arsenic	57	93	< 7.0		< 6.0	
Cadmium	5.1	6.7	**0.60**		**0.40**	
Chromium	260	270	**31.2**		**26.8**	
Copper	390	390	**28.7**		**14.5**	
Lead	450	530	**17.0**		**13.0**	
Mercury	0.41	0.59	**0.14**		**0.090**	
Nickel	NV	NV	**523**		**731**	
Silver	6.1	6.1	< 0.4		< 0.40	
Zinc	410	960	**84.5**		**50.8**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.086**	**4.3**	< 0.019	< 1.2
Acenaphthene	16	57	**0.22**	**11.0**	**0.030**	**1.9**
Acenaphthylene	66	66	**0.38**	**19.0**	**0.041**	**2.6**
Anthracene	220	1,200	**0.55**	**27.5**	**0.072**	**4.5**
Fluorene	23	79	**0.23**	**11.5**	**0.045**	**2.8**
Naphthalene	99	170	**0.25**	**12.5**	**0.023**	**1.4**
Phenanthrene	100	480	**2.5 D**	**<u>125</u> D**	**0.35**	**21.9**
Total LPAHs	562	780	**4.2**	**211**	**0.56**	**35.1**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**1.7 D**	**85.0 D**	**0.22**	**13.8**
Benzo(a)pyrene	99	210	**1.1**	**55.0**	**0.15**	**9.4**
Benzo(b)fluoranthene	230	450	**2.2 D**	**110 D**	**0.16**	**10.0**
Benzo(g,h,i)perylene	31	78	**0.25**	**12.5**	**0.042**	**2.6**
Benzo(k)fluoranthene	230	450	**1.4 D**	**70.0 D**	**0.25**	**15.6**
Chrysene	110	460	**5.1 D**	**<u>255</u> D**	**0.27**	**16.9**
Dibenz(a,h)anthracene	12	33	**0.066**	**3.3**	< 0.019	< 1.2
Fluoranthene	160	1,200	**8.3 D**	**<u>415</u> D**	**0.66**	**41.3**
Indeno(1,2,3-cd)pyrene	34	88	**0.33**	**16.5**	**0.069**	**4.3**
Pyrene	1,000	1,400	**9.6 D**	**480 D**	**0.66**	**41.3**
Total HPAHs	2,016	5,300	**30.0**	**1502**	**2.5**	**155**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**2.6 D**	**<u>130</u> D**	**0.14**	**8.8**
Butylbenzylphthalate	4.9	64	< 0.019	< 0.95	< 0.019	< 1.2
Diethylphthalate	61	110	< 0.019	< 0.95	< 0.019	< 1.2
Dimethylphthalate	53	53	**0.022**	**1.1**	< 0.019	< 1.2
Di-n-Butylphthalate	220	1,700	< 0.019	< 0.95	< 0.019	< 1.2
Di-n-Octyl phthalate	58	4,500	< 0.019	< 0.95	< 0.019	< 1.2
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	**0.030**		< 0.019	
2,4-Dimethylphenol	0.029	0.029	< 0.019		< 0.019	
2-Methylphenol	0.063	0.063	< 0.019		< 0.019	
4-Methylphenol	0.67	0.67	**0.035**		**0.026**	
Pentachlorophenol	0.36	0.69	< 0.097		< 0.097	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.019		< 0.019	
Benzoic Acid	0.65	0.65	< 0.19		< 0.19	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.019	< 0.95	< 0.019	< 1.2
1,2-Dichlorobenzene	2.3	2.3	< 0.019	< 0.95	< 0.019	< 1.2
1,3-Dichlorobenzene	NV	NV	< 0.019	< 0.95	< 0.019	< 1.2
1,4-Dichlorobenzene	3.1	9	< 0.019	< 0.95	< 0.019	< 1.2
Dibenzofuran	15	58	**0.28**	**14.0**	**0.032**	**2.0**
Hexachlorobenzene	0.38	2.3	< 0.019	< 0.95	< 0.019	< 1.2
Hexachlorobutadiene	3.9	6.2	< 0.019	< 0.95	< 0.019	< 1.2
N-Nitrosodiphenylamine	11	11	< 0.019	< 0.95	< 0.019	< 1.2
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	< 0.018	< 0.90	< 0.018	< 1.1
Aroclor 1221	12	65	< 0.036	< 1.8	< 0.036	< 2.3
Aroclor 1232	12	65	< 0.018	< 0.90	< 0.018	< 1.1
Aroclor 1242	12	65	< 0.018	< 0.90	< 0.018	< 1.1
Aroclor 1248	12	65	< 0.018	< 0.90	< 0.018	< 1.1
Aroclor 1254	12	65	**0.018**	**0.90**	< 0.018	< 1.1
Aroclor 1260	12	65	< 0.018	< 0.90	< 0.018	< 1.1
Total PCBs	12	65	**0.018**	**0.90**	< 0.036	< 2.3

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-3 8/25/2000		OG-4 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**35.5**		**32.2**	
Total Organic Carbon (%)	NV	NV	**2.7**		**2.8**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	**20.0**		**20.00**	
Arsenic	57	93	< 10.0		< 10.00	
Cadmium	5.1	6.7	**0.70**		**0.60**	
Chromium	260	270	**75.0**		**76.0**	
Copper	390	390	**57.0**		**61.6**	
Lead	450	530	**22.0**		**17.0**	
Mercury	0.41	0.59	**0.30**		**0.30**	
Nickel	NV	NV	**133**		**122**	
Silver	6.1	6.1	< 0.80		< 0.80	
Zinc	410	960	**130**		**132**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.055**	**2.0**	**0.27**	**9.6**
Acenaphthene	16	57	**0.062**	**2.3**	**0.053**	**1.9**
Acenaphthylene	66	66	**0.049**	**1.8**	**0.053**	**1.9**
Anthracene	220	1,200	**0.15**	**5.6**	**3.3 D**	**118 D**
Fluorene	23	79	**0.062**	**2.3**	**0.82**	**<u>29.3</u>**
Naphthalene	99	170	**0.075**	**2.8**	**0.11**	**3.9**
Phenanthrene	100	480	**0.39**	**14.4**	**2.7 D**	**96.4 D**
Total LPAHs	562	780	**0.84**	**31.2**	**7.3**	**261**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.36**	**13.3**	**0.75**	**26.8**
Benzo(a)pyrene	99	210	**0.20**	**7.4**	**0.23**	**8.2**
Benzo(b)fluoranthene	230	450	**0.32**	**11.9**	**0.52**	**18.6**
Benzo(g,h,i)perylene	31	78	**0.064**	**2.4**	**0.081**	**2.9**
Benzo(k)fluoranthene	230	450	**0.33**	**12.2**	**0.40**	**14.3**
Chrysene	110	460	**0.74**	**27.4**	**0.94**	**33.6**
Dibenz(a,h)anthracene	12	33	< 0.020	< 0.74	< 0.020	< 0.71
Fluoranthene	160	1,200	**0.94**	**34.8**	**3.0 D**	**107 D**
Indeno(1,2,3-cd)pyrene	34	88	**0.087**	**3.2**	**0.087**	**3.1**
Pyrene	1,000	1,400	**0.92**	**34.1**	**1.4 D**	**50.0 D**
Total HPAHs	2,016	5,300	**4.0**	**147**	**7.4**	**265**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**1.4**	**<u>51.9</u>**	**14.0 D**	**<u>500</u> D**
Butylbenzylphthalate	4.9	64	**0.045**	**1.7**	**0.030**	**1.1**
Diethylphthalate	61	110	< 0.020	< 0.74	< 0.020	< 0.71
Dimethylphthalate	53	53	< 0.020	< 0.74	< 0.020	< 0.71
Di-n-Butylphthalate	220	1,700	< 0.020	< 0.74	< 0.020	< 0.71
Di-n-Octyl phthalate	58	4,500	< 0.020	< 0.74	< 0.020	< 0.71
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	< 0.020		< 0.020	
2,4-Dimethylphenol	0.029	0.029	< 0.020		< 0.020	
2-Methylphenol	0.063	0.063	< 0.020		< 0.020	
4-Methylphenol	0.67	0.67	**0.094**		**0.076**	
Pentachlorophenol	0.36	0.69	< 0.099		< 0.099	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.020		< 0.020	
Benzoic Acid	0.65	0.65	< 0.20		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.020	< 0.74	< 0.020	< 0.71
1,2-Dichlorobenzene	2.3	2.3	< 0.020	< 0.74	< 0.020	< 0.71
1,3-Dichlorobenzene	NV	NV	< 0.020	< 0.74	< 0.020	< 0.71
1,4-Dichlorobenzene	3.1	9	< 0.020	< 0.74	< 0.020	< 0.71
Dibenzofuran	15	58	**0.094**	**3.5**	**0.29**	**10.4**
Hexachlorobenzene	0.38	2.3	< 0.020	< 0.74	< 0.020	< 0.71
Hexachlorobutadiene	3.9	6.2	< 0.020	< 0.74	< 0.020	< 0.71
N-Nitrosodiphenylamine	11	11	< 0.020	< 0.74	< 0.020	< 0.71
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	< 0.020	< 0.74	< 0.019	< 0.68
Aroclor 1221	12	65	< 0.039	< 1.4	< 0.038	< 1.36
Aroclor 1232	12	65	< 0.020	< 0.74	< 0.019	< 0.68
Aroclor 1242	12	65	< 0.020	< 0.74	< 0.019	< 0.68
Aroclor 1248	12	65	< 0.020	< 0.74	< 0.019	< 0.68
Aroclor 1254	12	65	< 0.020	< 0.74	**0.031**	**1.1**
Aroclor 1260	12	65	< 0.020	< 0.74	< 0.019	< 0.68
Total PCBs	12	65	< 0.039	< 1.4	**0.031**	**1.1**

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-100 (Duplicate of OG-04) 8/25/2000		OG-5 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**37.8**		**46.1**	
Total Organic Carbon (%)	NV	NV	**2.8**		**3.4**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	**20.0**		< 10.0	
Arsenic	57	93	< 10.0		< 10.0	
Cadmium	5.1	6.7	**0.60**		**0.70**	
Chromium	260	270	**77.0**		**47.0**	
Copper	390	390	**58.1**		**345**	
Lead	450	530	**19.0**		**25.0**	
Mercury	0.41	0.59	**0.30**		**0.21**	
Nickel	NV	NV	**126**		**80.0**	
Silver	6.1	6.1	< 0.80		< 0.70	
Zinc	410	960	**130**		**271**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.043**	**1.5**	**0.30**	**8.8**
Acenaphthene	16	57	**0.058**	**2.1**	**3.8 D**	**112 D**
Acenaphthylene	66	66	**0.034**	**1.2**	**0.19**	**5.6**
Anthracene	220	1,200	**0.11**	**3.9**	**9.2 D**	**271 D**
Fluorene	23	79	**0.066**	**2.4**	**1.5**	**44.1**
Naphthalene	99	170	**0.056**	**2.0**	**0.58**	**17.1**
Phenanthrene	100	480	**0.38**	**13.6**	**9.9 D**	**291 D**
Total LPAHs	562	780	**0.75**	**26.7**	**25.5**	**749**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.26**	**9.3**	**5.7 D**	**168 D**
Benzo(a)pyrene	99	210	**0.14**	**5.0**	**2.6 D**	**76.5 D**
Benzo(b)fluoranthene	230	450	**0.18**	**6.4**	**3.1 D**	**91.2 D**
Benzo(g,h,i)perylene	31	78	**0.044**	**1.6**	**0.37**	**10.9**
Benzo(k)fluoranthene	230	450	**0.24**	**8.6**	**2.9 D**	**85.3 D**
Chrysene	110	460	**0.33**	**11.8**	**7.7 D**	**226 D**
Dibenz(a,h)anthracene	12	33	< 0.020	< 0.71	**0.16**	**4.7**
Fluoranthene	160	1,200	**0.77**	**27.5**	**31.0 D**	**912 D**
Indeno(1,2,3-cd)pyrene	34	88	**0.054**	**1.9**	**0.58**	**17.1**
Pyrene	1,000	1,400	**0.84**	**30.0**	**22.0 D**	**647 D**
Total HPAHs	2,016	5,300	**2.9**	**102**	**76.1**	**2239**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**68.0 D**	**2429 D**	**19.0 D**	**559 D**
Butylbenzylphthalate	4.9	64	**0.027**	**0.96**	**0.089**	**2.6**
Diethylphthalate	61	110	< 0.020	< 0.71	< 0.020	< 0.59
Dimethylphthalate	53	53	< 0.020	< 0.71	**0.15**	**4.4**
Di-n-Butylphthalate	220	1,700	< 0.020	< 0.71	< 0.020	< 0.59
Di-n-Octyl phthalate	58	4,500	< 0.020	< 0.71	< 0.020	< 0.59
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	< 0.020		< 0.020	
2,4-Dimethylphenol	0.029	0.029	< 0.020		< 0.020	
2-Methylphenol	0.063	0.063	< 0.020		< 0.020	
4-Methylphenol	0.67	0.67	**0.054**		**0.091**	
Pentachlorophenol	0.36	0.69	< 0.098		< 0.098	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.020		< 0.020	
Benzoic Acid	0.65	0.65	< 0.20		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.020	< 0.71	< 0.020	< 0.59
1,2-Dichlorobenzene	2.3	2.3	< 0.020	< 0.71	< 0.020	< 0.59
1,3-Dichlorobenzene	NV	NV	< 0.020	< 0.71	< 0.020	< 0.59
1,4-Dichlorobenzene	3.1	9	< 0.020	< 0.71	< 0.020	< 0.59
Dibenzofuran	15	58	**0.099**	**3.5**	**0.94**	**27.6**
Hexachlorobenzene	0.38	2.3	< 0.020	< 0.71	< 0.020	< 0.59
Hexachlorobutadiene	3.9	6.2	< 0.020	< 0.71	< 0.020	< 0.59
N-Nitrosodiphenylamine	11	11	< 0.020	< 0.71	< 0.020	< 0.59
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	< 0.019	< 0.68	< 0.019	< 0.56
Aroclor 1221	12	65	< 0.038	< 1.4	< 0.044	< 1.3
Aroclor 1232	12	65	< 0.019	< 0.68	< 0.019	< 0.56
Aroclor 1242	12	65	< 0.019	< 0.68	< 0.019	< 0.56
Aroclor 1248	12	65	< 0.019	< 0.68	< 0.019	< 0.56
Aroclor 1254	12	65	< 0.019	< 0.68	**0.025**	**0.74**
Aroclor 1260	12	65	< 0.019	< 0.68	< 0.019	< 0.56
Total PCBs	12	65	< 0.038	< 1.4	**0.025**	**0.74**

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-6 8/24/2000		OG-7 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**72.4**		**45.5**	
Total Organic Carbon (%)	NV	NV	**1.0**		**2.6**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	**20.0**		< 10	
Arsenic	57	93	< 20.0		< 10	
Cadmium	5.1	6.7	< 0.70		**0.50**	
Chromium	260	270	**28.0**		**73.0**	
Copper	390	390	**17.9**		**59.2**	
Lead	450	530	**20.0**		**18.0**	
Mercury	0.41	0.59	**0.090**		**0.40**	**J**
Nickel	NV	NV	**1,120**		**129**	
Silver	6.1	6.1	< 1.0		< 0.6	
Zinc	410	960	**73.0**		**120**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.029**	**2.9**	**0.038**	**1.5**
Acenaphthene	16	57	**0.030**	**3.0**	**0.029**	**1.1**
Acenaphthylene	66	66	**0.028**	**2.8**	**0.029**	**1.1**
Anthracene	220	1,200	**0.074**	**7.4**	**0.160**	**6.2**
Fluorene	23	79	**0.032**	**3.2**	**0.049**	**1.9**
Naphthalene	99	170	**0.035**	**3.5**	**0.048**	**1.8**
Phenanthrene	100	480	**0.30**	**30.0**	**0.220**	**8.5**
Total LPAHs	562	780	**0.53**	**52.8**	**0.573**	**22.0**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.25**	**25.0**	**0.200**	**7.7**
Benzo(a)pyrene	99	210	**0.24**	**24.0**	**0.150**	**5.8**
Benzo(b)fluoranthene	230	450	**0.30**	**30.0**	**0.210**	**8.1**
Benzo(g,h,i)perylene	31	78	**0.079**	**7.9**	**0.066**	**2.5**
Benzo(k)fluoranthene	230	450	**0.30**	**30.0**	**0.210**	**8.1**
Chrysene	110	460	**0.46**	**46.0**	**0.360**	**13.8**
Dibenz(a,h)anthracene	12	33	< 0.020	< 2.0	**0.023**	**M** **0.88** **M**
Fluoranthene	160	1,200	**0.73**	**73.0**	**0.550**	**21.2**
Indeno(1,2,3-cd)pyrene	34	88	**0.085**	**8.5**	**0.850**	**32.7**
Pyrene	1,000	1,400	**0.94**	**94.0**	**0.540**	**20.8**
Total HPAHs	2,016	5,300	**3.4**	**338**	**3.16**	**121.5**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**0.40**	**40.0**	**0.67**	**25.8**
Butylbenzylphthalate	4.9	64	< 0.020	< 2.0	**0.025**	**1.0**
Diethylphthalate	61	110	< 0.020	< 2.0	< 0.020	< 0.77
Dimethylphthalate	53	53	< 0.020	< 2.0	< 0.020	< 0.77
Di-n-Butylphthalate	220	1,700	< 0.020	< 2.0	< 0.020	< 0.77
Di-n-Octyl phthalate	58	4,500	< 0.020	< 2.0	< 0.020	< 0.77
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	< 0.02		**0.046**	**M**
2,4-Dimethylphenol	0.029	0.029	< 0.02		< 0.02	
2-Methylphenol	0.063	0.063	< 0.02		< 0.02	
4-Methylphenol	0.67	0.67	< 0.02		**0.051**	
Pentachlorophenol	0.36	0.69	< 0.10		< 0.10	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.020		< 0.020	
Benzoic Acid	0.65	0.65	< 0.20		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.02	< 2	< 0.02	< 0.77
1,2-Dichlorobenzene	2.3	2.3	< 0.02	< 2	< 0.02	< 0.77
1,3-Dichlorobenzene	NV	NV	< 0.02	< 2	< 0.02	< 0.77
1,4-Dichlorobenzene	3.1	9	< 0.02	< 2	< 0.02	< 0.77
Dibenzofuran	15	58	**0.037**	**3.7**	**0.051**	**2.0**
Hexachlorobenzene	0.38	2.3	< 0.02	< 2	< 0.02	< 0.77
Hexachlorobutadiene	3.9	6.2	< 0.02	< 2	< 0.02	< 0.77
N-Nitrosodiphenylamine	11	11	< 0.02	< 2	< 0.02	< 0.77
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	< 0.018	< 1.8	NA	NA
Aroclor 1221	12	65	< 0.037	< 3.7	NA	NA
Aroclor 1232	12	65	< 0.018	< 1.8	NA	NA
Aroclor 1242	12	65	< 0.018	< 1.8	NA	NA
Aroclor 1248	12	65	< 0.018	< 1.8	NA	NA
Aroclor 1254	12	65	< 0.018	< 1.8	NA	NA
Aroclor 1260	12	65	< 0.018	< 1.8	NA	NA
Total PCBs	12	65	< 0.037	< 3.7	NA	NA

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-8 8/25/2000		OG-9 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**47.3**		**44.6**	
Total Organic Carbon (%)	NV	NV	**2.8**		**2.9**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	NA		NA	
Arsenic	57	93	NA		NA	
Cadmium	5.1	6.7	NA		NA	
Chromium	260	270	NA		NA	
Copper	390	390	NA		NA	
Lead	450	530	NA		NA	
Mercury	0.41	0.59	NA		NA	
Nickel	NV	NV	NA		NA	
Silver	6.1	6.1	NA		NA	
Zinc	410	960	NA		NA	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.039**	**1.4**	**0.049**	**1.7**
Acenaphthene	16	57	**0.029**	**1.0**	**0.043**	**1.5**
Acenaphthylene	66	66	**0.034**	**1.2**	**0.032**	**1.1**
Anthracene	220	1,200	**0.120**	**4.3**	**0.13**	**4.5**
Fluorene	23	79	**0.050**	**1.8**	**0.070**	**2.4**
Naphthalene	99	170	**0.047**	**1.7**	**0.056**	**1.9**
Phenanthrene	100	480	**0.220**	**7.9**	**0.27**	**9.3**
Total LPAHs	562	780	**0.539**	**19.2**	**0.650**	**22.4**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.230**	**8.2**	**0.24**	**8.3**
Benzo(a)pyrene	99	210	**0.170**	**6.1**	**0.15**	**5.2**
Benzo(b)fluoranthene	230	450	**0.250**	**8.9**	**0.29**	**10.0**
Benzo(g,h,i)perylene	31	78	**0.056**	**2.0**	**0.014 J**	**0.48**
Benzo(k)fluoranthene	230	450	**0.250**	**8.9**	**0.23**	**7.9**
Chrysene	110	460	**0.380**	**13.6**	**0.38**	**13.1**
Dibenz(a,h)anthracene	12	33	**0.021 M**	**0.7 M**	< 0.020	< 0.69
Fluoranthene	160	1,200	**0.560**	**20.0**	**0.67**	**23.1**
Indeno(1,2,3-cd)pyrene	34	88	**0.074**	**2.6**	**0.021**	**0.72**
Pyrene	1,000	1,400	**0.540**	**19.3**	**0.61**	**21.0**
Total HPAHs	2,016	5,300	**2.53**	**90.4**	**2.61**	**89.8**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**0.37**	**13.2**	**3.2 D**	**110.3 D**
Butylbenzylphthalate	4.9	64	**0.026**	**0.9**	**0.035 M**	**1.2**
Diethylphthalate	61	110	< 0.020	< 0.71	< 0.020	< 0.69
Dimethylphthalate	53	53	**0.022**	**0.8**	< 0.020	< 0.69
Di-n-Butylphthalate	220	1,700	< 0.020	< 0.71	**0.042 M**	**1.4**
Di-n-Octyl phthalate	58	4,500	< 0.020	< 0.71	< 0.020	< 0.69
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	**0.086 M**		**0.05 M**	
2,4-Dimethylphenol	0.029	0.029	< 0.02		**0.043**	
2-Methylphenol	0.063	0.063	< 0.02		< 0.020	
4-Methylphenol	0.67	0.67	**0.068**		**0.062**	
Pentachlorophenol	0.36	0.69	< 0.10		< 0.10	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.02		< 0.020	
Benzoic Acid	0.65	0.65	< 0.20		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.020	< 0.71	< 0.020	< 0.69
1,2-Dichlorobenzene	2.3	2.3	< 0.020	< 0.71	< 0.020	< 0.69
1,3-Dichlorobenzene	NV	NV	< 0.020	< 0.71	< 0.020	< 0.69
1,4-Dichlorobenzene	3.1	9	< 0.020	< 0.71	< 0.020	< 0.69
Dibenzofuran	15	58	**0.052**	**1.9**	**0.068**	**2.3**
Hexachlorobenzene	0.38	2.3	< 0.020	< 0.71	< 0.020	< 0.69
Hexachlorobutadiene	3.9	6.2	< 0.020	< 0.71	< 0.020	< 0.69
N-Nitrosodiphenylamine	11	11	< 0.020	< 0.71	< 0.020	< 0.69
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	NA	NA	NA	NA
Aroclor 1221	12	65	NA	NA	NA	NA
Aroclor 1232	12	65	NA	NA	NA	NA
Aroclor 1242	12	65	NA	NA	NA	NA
Aroclor 1248	12	65	NA	NA	NA	NA
Aroclor 1254	12	65	NA	NA	NA	NA
Aroclor 1260	12	65	NA	NA	NA	NA
Total PCBs	12	65	NA	NA	NA	NA

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-10 8/25/2000		OG-11 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**41.4**		**44.8**	
Total Organic Carbon (%)	NV	NV	**3.2**		**3.0**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	NA		< 10	
Arsenic	57	93	NA		< 10	
Cadmium	5.1	6.7	NA		**0.5**	
Chromium	260	270	NA		**62.0**	
Copper	390	390	NA		**61.0**	
Lead	450	530	NA		**136**	
Mercury	0.41	0.59	NA		< 0.10	**J**
Nickel	NV	NV	NA		**47.0**	
Silver	6.1	6.1	NA		< 0.7	
Zinc	410	960	NA		**170**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.059**	**1.8**	**0.032**	**1.1**
Acenaphthene	16	57	**0.072**	**2.3**	**0.24**	**8.0**
Acenaphthylene	66	66	**0.035**	**1.1**	**0.058**	**1.9**
Anthracene	220	1,200	**0.14**	**4.4**	**0.24**	**8.0**
Fluorene	23	79	**0.082**	**2.6**	**0.10**	**3.3**
Naphthalene	99	170	**0.063**	**2.0**	**0.046**	**1.5**
Phenanthrene	100	480	**0.38**	**11.9**	**0.73**	**24.3**
Total LPAHs	562	780	**0.83**	**26.0**	**1.4**	**48.2**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.26**	**8.1**	**0.60**	**20.0**
Benzo(a)pyrene	99	210	**0.15**	**4.7**	**0.36**	**12.0**
Benzo(b)fluoranthene	230	450	**0.24**	**7.5**	**0.68**	**22.7**
Benzo(g,h,i)perylene	31	78	**0.052**	**1.6**	**0.082**	**2.7**
Benzo(k)fluoranthene	230	450	**0.32**	**10.0**	**0.56**	**18.7**
Chrysene	110	460	**0.32**	**10.0**	**0.67**	**22.3**
Dibenz(a,h)anthracene	12	33	< 0.020	< 0.63	**0.031**	**1.0**
Fluoranthene	160	1,200	**0.87**	**27.2**	**2.5 D**	**83.3 D**
Indeno(1,2,3-cd)pyrene	34	88	**0.078**	**2.4**	**0.12**	**4.0**
Pyrene	1,000	1,400	**0.98**	**30.6**	**3.2 D**	**107 D**
Total HPAHs	2,016	5,300	**3.3**	**102**	**8.8**	**293**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**2.8 D**	**87.5 D**	**28.0 D**	**933 D**
Butylbenzylphthalate	4.9	64	< 0.020	< 0.63	**0.020**	**0.67**
Diethylphthalate	61	110	< 0.020	< 0.63	< 0.020	< 0.67
Dimethylphthalate	53	53	< 0.020	< 0.63	**0.68**	**22.7**
Di-n-Butylphthalate	220	1,700	< 0.020	< 0.63	**0.11**	**3.7**
Di-n-Octyl phthalate	58	4,500	< 0.020	< 0.63	< 0.020	< 0.67
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	< 0.020		< 0.020	
2,4-Dimethylphenol	0.029	0.029	< 0.020		< 0.020	
2-Methylphenol	0.063	0.063	< 0.020		< 0.020	
4-Methylphenol	0.67	0.67	**0.089**		**0.070**	
Pentachlorophenol	0.36	0.69	< 0.10		< 0.10	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.020		< 0.020	
Benzoic Acid	0.65	0.65	< 0.20		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.020	< 0.63	< 0.02	< 0.67
1,2-Dichlorobenzene	2.3	2.3	< 0.020	< 0.63	< 0.02	< 0.67
1,3-Dichlorobenzene	NV	NV	< 0.020	< 0.63	< 0.02	< 0.67
1,4-Dichlorobenzene	3.1	9	< 0.020	< 0.63	< 0.02	< 0.67
Dibenzofuran	15	58	**0.098**	**3.1**	**0.13**	**4.3**
Hexachlorobenzene	0.38	2.3	< 0.020	< 0.63	< 0.02	< 0.67
Hexachlorobutadiene	3.9	6.2	< 0.020	< 0.63	< 0.02	< 0.67
N-Nitrosodiphenylamine	11	11	< 0.020	< 0.63	< 0.02	< 0.67
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	NA	NA	NA	NA
Aroclor 1221	12	65	NA	NA	NA	NA
Aroclor 1232	12	65	NA	NA	NA	NA
Aroclor 1242	12	65	NA	NA	NA	NA
Aroclor 1248	12	65	NA	NA	NA	NA
Aroclor 1254	12	65	NA	NA	NA	NA
Aroclor 1260	12	65	NA	NA	NA	NA
Total PCBs	12	65	NA	NA	NA	NA

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Table A-3 Summary of Phase 2 Surface Sediment Analytical Data

Parameter	SMS Criteria SQS	SMS Criteria MCUL	OG-12 8/25/2000		OG-13 8/25/2000	
Conventionals						
Total Solids (%)	NV	NV	**43.6**		**41.9**	
Total Organic Carbon (%)	NV	NV	**2.6**		**3.8**	
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Antimony	NV	NV	NA		< 10	
Arsenic	57	93	NA		< 10	
Cadmium	5.1	6.7	NA		**0.6**	
Chromium	260	270	NA		**49**	
Copper	390	390	NA		**43**	
Lead	450	530	NA		**14**	
Mercury	0.41	0.59	NA		**0.3 J**	
Nickel	NV	NV	NA		**71**	
Silver	6.1	6.1	NA		< 0.7	
Zinc	410	960	NA		**176**	
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
2-Methylnaphthalene	38	64	**0.044**	**1.7**	**0.14**	**3.7**
Acenaphthene	16	57	**0.039**	**1.5**	**0.30**	**7.9**
Acenaphthylene	66	66	**0.025**	**1.0**	**0.11**	**2.9**
Anthracene	220	1,200	**0.084**	**3.2**	**0.49**	**12.9**
Fluorene	23	79	**0.059**	**2.3**	**0.34**	**8.9**
Naphthalene	99	170	**0.048**	**1.8**	**0.12**	**3.2**
Phenanthrene	100	480	**0.20**	**7.7**	**1.7 D**	**44.7 D**
Total LPAHs	562	780	**0.499**	**19.2**	**3.2**	**84.2**
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Benzo(a)anthracene	110	270	**0.16**	**6.2**	**1.2**	**31.6**
Benzo(a)pyrene	99	210	**0.11**	**4.2**	**0.56**	**14.7**
Benzo(b)fluoranthene	230	450	**0.22**	**8.5**	**0.8**	**21.1**
Benzo(g,h,i)perylene	31	78	< 0.019	< 0.73	**0.14**	**3.7**
Benzo(k)fluoranthene	230	450	**0.17**	**6.5**	**1.2**	**31.6**
Chrysene	110	460	**0.26**	**10.0**	**1.5**	**39.5**
Dibenz(a,h)anthracene	12	33	< 0.019	< 0.73	**0.038**	**1.0**
Fluoranthene	160	1,200	**0.50**	**19.2**	**5.6 D**	**147 D**
Indeno(1,2,3-cd)pyrene	34	88	**0.017 J**	**0.7**	**0.2**	**5.3**
Pyrene	1,000	1,400	**0.42**	**16.2**	**5.6 D**	**147 D**
Total HPAHs	2,016	5,300	**1.86**	**71.4**	**16.8**	**443**
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
bis(2-Ethylhexyl)phthalate	47	78	**1.4**	**53.8**	**16.0**	**421**
Butylbenzylphthalate	4.9	64	**0.014 JM**	**0.5**	< 0.020	< 0.53
Diethylphthalate	61	110	< 0.019	< 0.73	< 0.020	< 0.53
Dimethylphthalate	53	53	< 0.019	< 0.73	**0.046**	**1.2**
Di-n-Butylphthalate	220	1,700	< 0.019	< 0.73	< 0.020	< 0.53
Di-n-Octyl phthalate	58	4,500	< 0.019	< 0.73	< 0.020	< 0.53
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Phenol	0.42	1.2	**0.052 M**		< 0.020	
2,4-Dimethylphenol	0.029	0.029	**0.019 J**		< 0.020	
2-Methylphenol	0.063	0.063	< 0.019		< 0.020	
4-Methylphenol	0.67	0.67	**0.056**		**0.11**	
Pentachlorophenol	0.36	0.69	**0.018 J**		< 0.099	
Misc. Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		*(mg/kg)*	
Benzyl Alcohol	0.057	0.073	< 0.019		< 0.020	
Benzoic Acid	0.65	0.65	< 0.19		< 0.20	
Misc. Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
1,2,4-Trichlorobenzene	0.81	1.8	< 0.019	< 0.73	< 0.020	< 0.53
1,2-Dichlorobenzene	2.3	2.3	< 0.019	< 0.73	< 0.020	< 0.53
1,3-Dichlorobenzene	NV	NV	< 0.019	< 0.73	< 0.020	< 0.53
1,4-Dichlorobenzene	3.1	9	< 0.019	< 0.73	< 0.020	< 0.53
Dibenzofuran	15	58	**0.059**	**2.3**	**0.30**	**7.9**
Hexachlorobenzene	0.38	2.3	< 0.019	< 0.73	< 0.020	< 0.53
Hexachlorobutadiene	3.9	6.2	< 0.019	< 0.73	< 0.020	< 0.53
N-Nitrosodiphenylamine	11	11	< 0.019	< 0.73	< 0.020	< 0.53
PCBs	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*	*(mg/kg)*	*(ppm TOC)*
Aroclor 1016	12	65	NA	NA	NA	NA
Aroclor 1221	12	65	NA	NA	NA	NA
Aroclor 1232	12	65	NA	NA	NA	NA
Aroclor 1242	12	65	NA	NA	NA	NA
Aroclor 1248	12	65	NA	NA	NA	NA
Aroclor 1254	12	65	NA	NA	NA	NA
Aroclor 1260	12	65	NA	NA	NA	NA
Total PCBs	12	65	NA	NA	NA	NA

NOTES:

Single underlined values exceed the SQS value
Double underlined values exceed the MCUL value
NV - No Value
NA - Not Analyzed
D - Indicates value reported in diluted sample.
J - Indicated value is an estimate.

Attachment B

Field Forms

Sediment Core Drive Log

Job:

Job No:

Field Reps:

Contractor:

Core Location:

Date: Time:

Attempt #: Accept/Reject

Sample Method:

Proposed Coordinates	Actual Coordinates
N: E:	N: E:
Mudline:	Mudline:
Core Drive:	Core Drive: Core Recovery:

DTS Boat:

DTS Lead Line:

Mudline Elevation:

Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

Measurement (to nearest 0.1 foot):

Core Tube Length:

Avg. % Recovery:

Avg. % Compaction:

Section:	Length:	Description at Cuts:
A =		
B =		
C =		
D =		

Total Drive: Length Recovered:

Notes:

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Sediment Core Processing Log

Job:

Job Number:

No. of Sections:

Sample Length (from log):

Avg. % Compaction:

Core Location/Sample Number:

Date/ Time:

Sample Logged by:

Type/Diameter of Sample:

Sample Quality: good fair poor disturbed

Notes:

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Insitu Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch

DAILY FIELD REPORT

RETEC

Job:

Arrival Time:

Location/Client:

Departure Time:

Job Number:

Weather:

Purpose of Observations:

RETEC Representative:

RETEC Project Manager:

Contractor:

Permit No.:

Contractor Rep:

Job Phone:

ATTENDEES:

SCOPE:

ACTIVITIES:

ACTION ITEMS:

Attachment C

Reporting Requirements for Chemical Variables and Bioassays

1 Chemical Variables

1.1 ORGANIC COMPOUNDS

The following documentation is needed for organic compounds:

- A cover letter referencing or describing the procedure used and discussing any analytical problems;
- Reconstructed ion chromatograms for GC/MS analyses for each sample;
- Mass spectra of detected target compounds (GC/MS) for each sample and associated library spectra;
- GC/ECD and/or GC/flame ionization detection chromatograms for each sample;
- Raw data quantification reports for each sample;
- A calibration data summary reporting calibration range used [and decafluorotriphenylphosphine (DFTPP) and bromofluorobenzene (BFB) spectra and quantification report for GC/MS analyses];
- Final dilution volumes, sample size, wet-to-dry ratios, and instrument detection limit;
- Analyte concentrations with reporting units identified (to two significant figures unless otherwise justified);
- Quantification of all analytes in method blanks (ng/sample);
- Method blanks associated with each sample;
- Recovery assessments and a replicate sample summary (laboratories should report all surrogate spike recovery data for each sample; a statement of the range of recoveries should be included in reports using these data); and
- Data qualification codes and their definitions.

2 BIOASSAYS

2.1 Amphipod Mortality Test

The following data should be reported by all laboratories performing this bioassay:

- Daily water quality measurements during testing (e.g., dissolved oxygen, temperature, salinity, pH) (plus ammonia & sulfides at test initiation and termination);
- Daily emergence for each beaker and the 10-day mean and standard deviation for each treatment;
- 10-day survival in each beaker and the mean and standard deviation for each treatment;
- Interstitial salinity values of test sediments;
- 96-hour LC50 values with reference toxicants; and
- Any problems that may have influenced data quality.

2.2 *Neanthes* Growth Test

The following data should be reported by all laboratories performing this bioassay:

- Water quality measurements at test initiation and termination and every three days during testing (e.g., dissolved oxygen, temperature, salinity, pH) (plus ammonia & sulfides at test initiation and termination);
- 20-day survival in each beaker and the mean and standard deviation for each treatment;
- Initial biomass;
- Final biomass (20-day) for test, reference and control treatments;
- 96-hour LC50 values with reference toxicants; and
- Any problems that may have influenced data quality.