CENWS-OD-TS-DM

MEMORANDUM FOR RECORD 19 May 2005

SUBJECT: DETERMINATION OF THE SUITABILITY OF SEDIMENT PROPOSED TO BE MAINTENANCED DREDGED FROM THE PORT OF SILVERDALE WATERFRONT PARK BOAT RAMP AND MARINA (#2003-00954) FOR OPEN-WATER DISPOSAL AT A WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES (DNR) OPEN WATER DISPOSAL SITE (ELLIOTT BAY), AS EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT.

1. The following summary reflects the consensus determination of the agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington. The agencies include the Corps of Engineers, Department of Ecology, Department of Natural Resources, and the Environmental Protection Agency. The agencies are charged with determining the suitability of proposed dredged material for in-water disposal and have evaluated the proposed maintenance dredging of 3950 cubic yards from the Port of Silverdale Waterfront Park Boat Ramp and Marina Project located in Dyes Inlet.

2. The project was ranked moderate for testing purposes. The sampling and analysis plan was approved on February 4, 2005 by the DMMP agencies for an estimated total dredged material footprint volume of 3950 cubic yards. The sampling design called for analyzing 3950 CY of the proposed maintenance material down to – 3 feet MLLW. Sampling of the proposed maintenance dredging footprint (see figure 1 - 3) was conducted on March, 17, 2005, and consisted on collected samples at 6 locations using 4-inch diameter hand core (clam gun). The 6 core station samples (see figures 2 and 3) were composited into two dredged materials management units (DMMUs) as follows:

Samples were collected for both chemistry and potential biological testing. A tiered testing approach was used, and all samples for potential biological testing were archived at 4°C pending completion of the chemical analysis.

3. Relevant dates for regulatory tracking purposed are included in Table 1.

Table 1. Regulatory Tracking Information and Dates

SAP submittal date:	December 14, 2004
SAP Approval letter date:	February 4, 2005
Sampling date(s):	March 17, 2005
Sediment data characterization report submittal date:	May 9, 2005
DAIS Tracking Number	SWPSD-1-A-F-215
Recency Determination Date: Moderate (5 years)	March 2010

4. The sampling and Analysis Plan approved by the agencies for testing for the two DMMUs was followed, and quality assurance/quality control guidelines specified by the PSDDA Users Manual were generally complied with. The data gathered were deemed sufficient and acceptable

for decision-making by the DMMP agencies based on best professional judgment and current program guidelines.

5. Table 2 provides an analysis summary of the results of the conventional parameters analyzed for the two composited DMMUs. Chemical analysis of the two DMMUs indicated that there were no detected or detection limit exceedences of screening level for all chemicals of concern. Table 3 provides a complete dry weight chemical analysis inventory for the two DMMUs analyzed. There were no bioaccumulation trigger (BT) or maximum level (ML) exceedances of COCs analyzed. Because there were no SL guideline exceedances, biological testing was not required.

Note: TBT samples were collected on March 17, 2005 and stored at Nautilus labs at 4C under nitrogen until transferred to STL. STL did not run TBT with the initial chemical analysis run. All Aroclor data should be in ug/kg, there were typographical errors that were not identified in the initial data report. Also, Grette Associates did not test for ammonia and sulfides per the approved SAP (DMMP review missed this).

6. The results of the chemical analysis for the two composited DMMUs representing a total of 3950 CY of potential dredged material is determined to be suitable for unconfined open-water disposal at DNR approved disposal site.

7. This memorandum documents the suitability of sediment to be dredged from the Silverdale Marina maintenance dredging project for disposal at a DNR approved dispersive open-water disposal site. However, this suitability determination does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final project approval process. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under Section 404(b)(1) of the Clean Water Act.

Concur:

6/2/2005
Date

Gwyn Puckett, Seattle District Corps of Engineers

6/2/2005
Date

Jonathan Freedman, Environmental Protection Agency

6/2/05
Date

Cinde Donoghue, Washington Department of Ecology

June 2, 2005
Date

Peter Leon, Washington Department of Natural Resources

Copies Furnished:
Rozwin Liera, Regulatory Branch Project Manager
Jonathan Freedman, EPA
Cinde Donoghue, Ecology
Peter Leon, DNR
DMMO File

Table 2. DMMP Testing Summary for Silverdale Waterfront Park Marina

CHEMICAL NAME	DMMU	BR (surface)		MA (surface)	
	Rank	M		M	
	Units	Conc.		Conc.	
Total Solids	%	77.66		78.26	
Total Volatile Solids	%	2.08		1.54	
Total Organic Carbon	%	4.1		6.2	
Total Ammonia*	mg/kg	NA		NA	
Total Sulfides*	mg/kg	NA		NA	
Gravel (percent)	%	4.7		0.3	
Sand (percent)	%	86.6		93.1	
Silt (percent)	%	5.4		3.4	
Clay (percent)	%	3.3		3.2	
Fines (percent silt + clay)	%	8.7		6.6	
Eohaustorius estuaries hits:		NA		NA	
Mytilus galloprovincialis hits:		NA		NA	
Neanthes areaceodentata hits:		NA		NA	
Bioassay Pass/Fail:		NA		NA	
BTs exceeded:		no		no	
Bioaccumulation conducted:		no		no	
Bioaccumulations Pass/Fail:		NA		NA	
ML Rule exceeded:		no		no	
PSDDA Determination:					
DMMU Volume:	cy	2350		1600	
DMMU ID:		BR		MA	

* Ammonia and sulfides were not analyzed for.

Table 3. Sampling Station Boring Depths and Elevations

DMMU	Sampling Station Number	Length of Sediment Core	Depth
BR	1	30"	0 to -3
	2	28"	+2 to 0
	3	23"	-1 to -2
MA	4	22"	-7 to -8
	5	24"	-3 to -4
	6	23"	-5 to -7

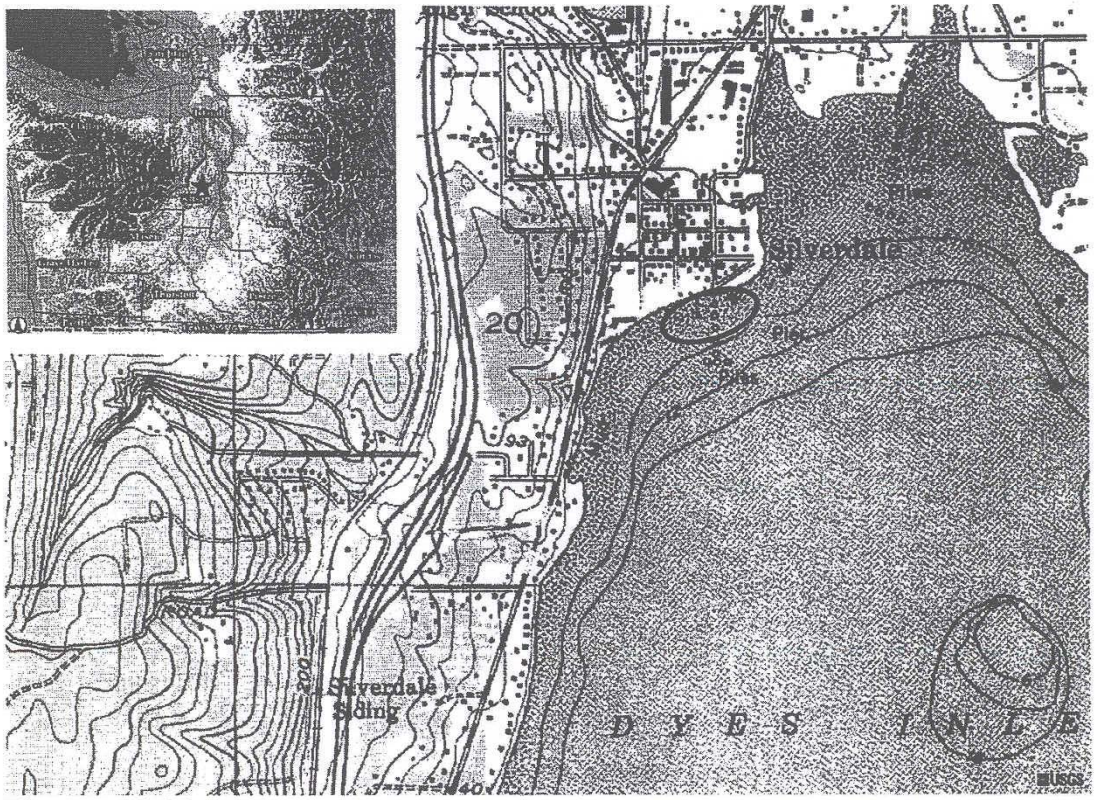
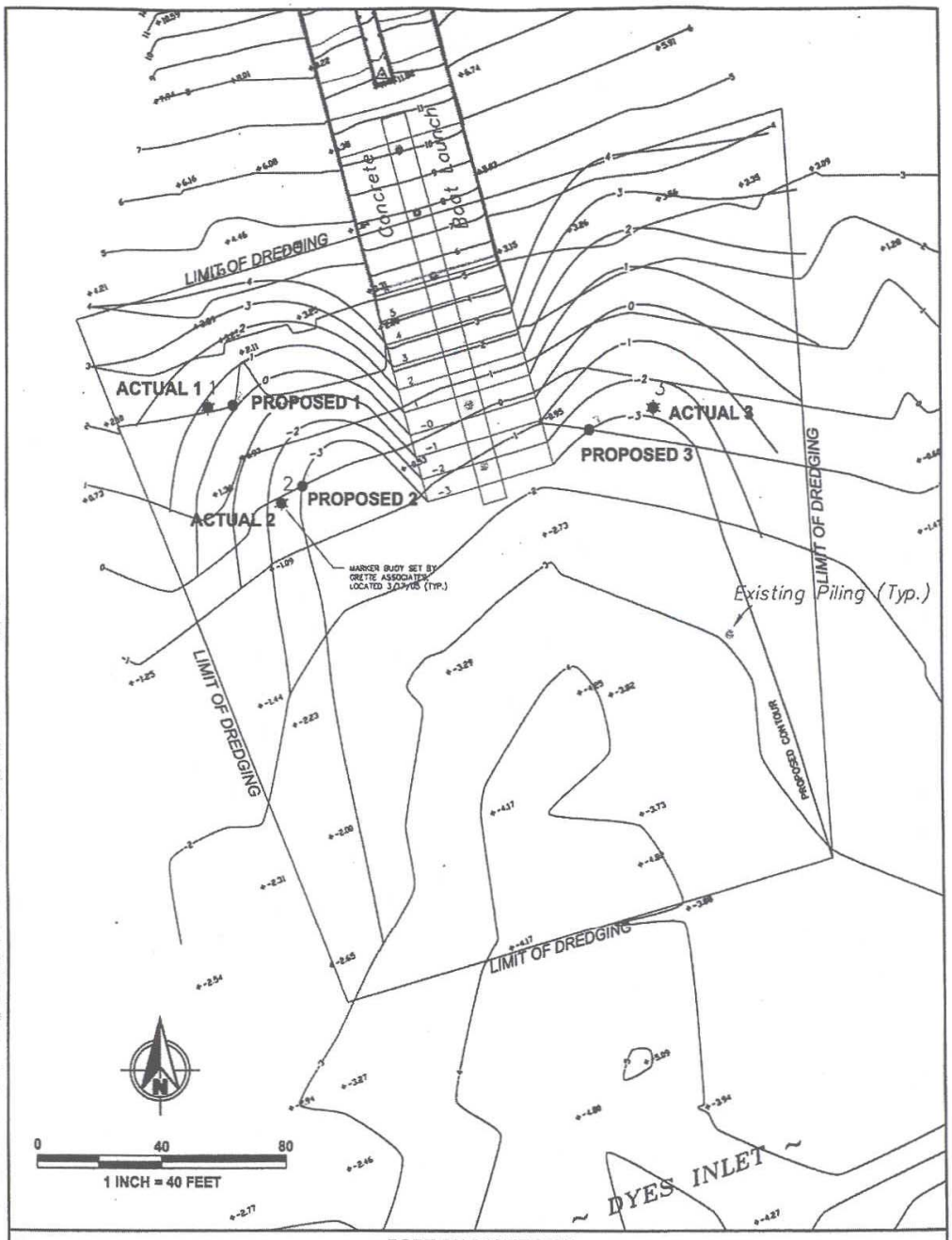


Figure 1. Vicinity map



AT: SILVERDALE WATERFRONT PARK
COUNTY: KITSAP
STATE: WA

PORT OF SILVERDALE

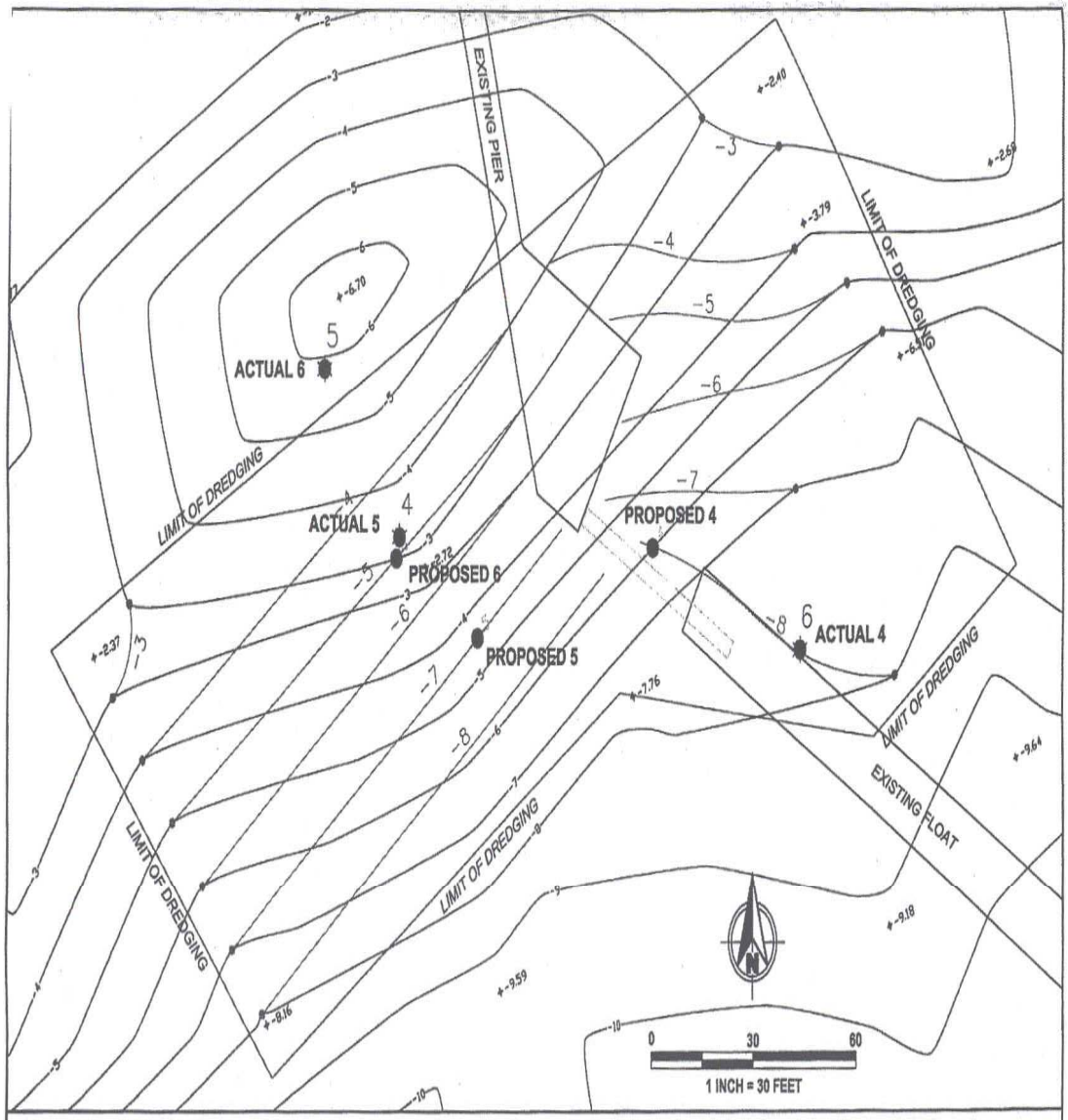
GRETTE ASSOCIATES, LLC

FIGURE 2: SEDIMENT SAMPLING POINTS 1-3

DATE: MAY 2005
FILE NAME: 150.001

SILVERDALE WATERFRONT PARK MAINTENANCE DREDGE
SEDIMENT CHARACTERIZATION FINAL REPORT

2111 NORTH 30TH
TACOMA, WA 98403
PHONE: (253) 573-9300
FAX: (253) 573-9321



AT: SILVERDALE WATERFRONT PARK
COUNTY: KITSAP
STATE: WA

PORT OF SILVERDALE

GRETTE ASSOCIATES, LLC

FIGURE 3: SEDIMENT SAMPLING POINTS 4-6

2111 NORTH 30TH
TACOMA, WA 98403
PHONE: (253) 573-9300
FAX: (253) 573-9321

DATE: MAY 2005
FILE NAME: 150.001

SILVERDALE WATERFRONT PARK MAINTENANCE DREDGE
SEDIMENT CHARACTERIZATION FINAL REPORT

APPENDIX B. PSDDA PARAMETERS, METHODS, AND RESULTS

Parameter	Prep Method	Analysis Method	Boat Ramp	Moorage	SL	PSDDA BT	ML	SMS SQS	Method Detection Limit
CONVENTIONALS:									
Total Solids (%)	---	EPA 160.3 M	77.66	78.26	---	---	---	---	
Total Volatile Solids (%)	---	Pg.20 [2]	2.08	1.54	---	---	---	---	
Total Organic Carbon (%)	---	PSEP	4.1	6.2	---	---	---	---	
Grain Size	---	ASTM D422	See report		---	---	---	---	
METALS			units: mg/kg dw		units: mg/kg dw [3]				units: mg/kg dw
Antimony	3051	6010	ND	ND	150	150	200	150	0.318
Arsenic	3051	6010	ND	ND	57	507.1	700	57	0.861
Cadmium	3051	6010	0.138[J]	0.456[J]	5.1	---	14	5.1	0.055
Chromium	3051	6010	13.7	12.6	---	---	---	260	0.0896
Copper	3051	6010	10.5	6.2	390	---	1,300	390	0.228
Lead	3051	6010	ND	1.85[J]	450	---	1,200	450	0.242
Mercury	7471 [4]	7471	ND	0.0144	0.41	1.5	2.3	0.41	0.00873
Nickel	3051	6010	16.8	15.2	140	370	370	---	0.101
Selenium	3051	6010	ND	ND	0.0967	3	-2		1.5
Silver	3051	6010	ND	ND	6.1	6.1	8.4	6.1	0.0531
Zinc	3051	6010	16	19.4	410	---	3,800	410	0.0785
ORGANOMETALLIC COMPOUNDS			units: ug/L						units: ug/L
Tributyltin	Krone	Krone	ND	ND	0.15	0.15	---		0.0015

Parameter	Prep Method	Analysis Method	Boat Ramp	Moorage	SL	PSDDA BT	ML	SMS SQS	Method Detection Limit
ORGANICS									
LPAH			units: ug/kg dw		units: ug/kg dw				units: ug/kg dw
Naphthalene	3550	8270 (5), 5030/8260B	ND	ND	2,100	---	2,400	99	0.886
Acenaphthylene	3550	8270	ND	ND	560	---	1,300	66	0.589
Acenaphthene	3550	8270	ND	ND	500	---	2,000	16	0.513
Fluorene	3550	8270	ND	ND	540	---	3,600	23	0.646
Phenanthrene	3550	8270	ND	ND	1,500	---	21,000	100	0.594
Anthracene	3550	8270	ND	ND	960	---	13,000	220	0.38
2-Methylnaphthalene	3550	8270	ND	ND	670	---	1,900	38	0.52
Total LPAH			---	---	5,200	---	29,000	370	
HPAH			units: ug/kg dw		units: ug/kg dw				units: ug/kg dw
Fluoranthene	3550	8270	5.84	7.19	1,700	4600	30,000	160	1.01
Pyrene	3550	8270	6.26	7.24	2,600	---	16,000	1000	0.34
Benzo(a)anthracene	3550	8270	2.46	ND	1,300	---	5,100	110	1.01
Chrysene	3550	8270	3.91	5.49	1,400	---	21,000	110	0.715
Benzofluoranthenes	3550	8270	7.3	5.66	3,200	---	9,900	230	0.906
Benzo(a)pyrene	3550	8270	ND	ND	1,600	3,600	3,600	99	0.633
Indeno(1,2,3-c,d)pyrene	3550	8270	ND	ND	600	---	4,400	34	0.456
Dibenzo(a,h)anthracene	3550	8270	ND	ND	230	---	1,900	12	0.621
Benzo(g,h,i)perylene	3550	8270	ND	ND	670	---	3,200	31	0.481
Total HPAH			25.77	25.58	12,000	---	69,000	960	
CHLORINATED HYDROCARBONS			units: ug/kg dw		units: ug/kg dw				units: ug/kg dw
1,3-Dichlorobenzene	3550	5030/8260B	ND	ND	170	1,241	---	---	0.852

Parameter	Prep Method	Analysis Method	Boat Ramp	Moorage	SL	PSDDA BT	ML	SMS SCS	Method Detection Limit
1,4-Dichlorobenzene	3550	5030/8260B	ND	ND	110	120	120	3.1	0.841
1,2-Dichlorobenzene	3550	5030/8260B	ND	ND	35	37	110	2.3	0.679
1,2,4-Trichlorobenzene	3550	5030/8260B	ND	ND	31	---	64	0.81	0.849
Hexachlorobenzene (HCB)	3550	8270	ND	ND	22	230	22	0.38	0.89
PHTHALATES			units: ug/kg dw			units: ug/kg dw			units: ug/kg dw
Dimethyl phthalate	3550	8270	ND	ND	1,400	1,400	---	53	1.96
Diethyl phthalate	3550	8270	ND	ND	1,200	---	---	61	3.61
Di-n-butyl phthalate	3550	8270	14.7	50.6	5,100	10,220	---	220	1.82
Butyl benzyl phthalate	3550	8270	ND	ND	970	---	---	4.9	2.14
Bis(2-ethylhexyl)phthalate	3550	8270	29.6	42.3	8,300	13,870	---	47	1.83
Di-n-octyl phthalate	3550	8270	ND	ND	6,200	---	---	58	1.84
PHENOLS			units: ug/kg dw			units: ug/kg dw			units: ug/kg dw
Phenol	3550	8270	213	ND	420	876	1,200	420	0.723
2 Methylphenol	3550	8270	ND	ND	63	---	77	63	0.944
4 Methylphenol	3550	8270	ND	ND	670	---	3,600	670	1.18
2,4-Dimethylphenol	3550	8270	ND	ND	29	---	210	29	0.765
Pentachlorophenol	3550	8270	ND	ND	400	504	690	360	1.94
MISCELLANEOUS EXTRACTABLES			units: ug/kg dw			units: ug/kg dw			units: ug/kg dw
Benzyl alcohol	3550	8270	ND	ND	57	---	870	57	1.99
Benzoic acid	3550	8270	ND	ND	650	---	760	650	16
Dibenzofuran	3550	8270	ND	ND	540	---	1,700	15	0.462
Hexachloroethane	3550	8270	ND	ND	1,400	10,220	14,000	---	1.69

Parameter	Prep Method	Analysis Method	Boat Ramp	Moorage	SL	PSDDA BT	ML	SMS SQS	Method Detection Limit
Hexachlorobutadiene	3550	8270	ND	ND	29	212	270	3.9	0.43
N-Nitrosodiphenylamine	3550	8270	ND	ND	28	130	130	11	0.572
VOLATILE ORGANICS						units: ug/kg dw			units: ug/kg dw
Trichloroethene	5035	5030/8260B	ND	ND	160	1,168	1,600	---	0.0321
Tetrachloroethene	5035	5030/8260B	ND	ND	57	102	210	---	0.101
Ethylbenzene	5035	5030/8260B	ND	ND	10	27	50	---	0.0247
Total Xylene	5035	5030/8260B	ND	ND	40	---	160	---	0.0843
PESTICIDES & PCBs			units: ug/kg dw			units: ug/kg dw			units: ug/kg dw
Total DDT	---	---	ND	ND	6.9	50	69	---	
p,p'-DDE	3550	8081A [6]	ND	ND	---	---	---	---	0.186
p,p'-DDD	3550	8081A	ND	ND	---	---	---	---	0.204
p,p'-DDT	3550	8081A	ND	ND	---	---	---	---	0.235
Aldrin	3550	8081A	ND	ND	10	37	---	---	0.103
Chlordane	3550	8081A	ND	ND	10	37	---	---	0.108
Dieldrin	3550	8081A	ND	ND	10	37	---	---	0.243
Heptachlor	3550	8081A	ND	ND	10	37	---	---	0.082
Lindane	3550	8081A	ND	ND	10	---	---	---	0.12
Total PCBs	3550	8081A	ND	ND	130	38 [7]	3,100	12	

1. *Recommended* Sample Preparation Methods, Cleanup Methods, Analytical Methods and Detection Limits for Sediment Management Standards, Chapter 173-204 WAC, Draft - July 1996.
2. *Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound*, Puget Sound Estuary Program, March, 1986.
3. units: ug = microgram, mg = milligram, kg = kilogram, dw = dry weight, oc = organic carbon.
4. *Test Methods for Evaluating Solid Waste. Laboratory manual physical/chemical methods.* Method 7471, SW-846, 3rd ed., Vol 1A, Chapter 3, Sec 3.3. Office of Solid Waste and Emergency Response, Washington, DC.
5. GCMS Capillary Column - Method 8270, SW-846, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*, EPA 1986.
6. GCMS Capillary Column - Method 8081, SW-846, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*, EPA 1986.
7. Total PCBs BT value in mg/kg oc.

STL Seattle
Method Detection Limits & Reporting Limits for Sediments

Method: SW6010 Metals by ICP
Preparation Method: SW3051
Standard Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (mg/kg)	MDL (mg/kg)	Holding Time
Antimony	7440-36-0	10	1.07	6 Months
Arsenic	7440-38-2	2.5	0.861	6 Months
Cadmium	7440-43-9	1	0.0426	6 Months
Chromium	7440-47-3	2	0.0896	6 Months
Copper	7440-50-8	2	0.228	6 Months
Lead	7439-92-1	2	0.41	6 Months
Nickel	7440-02-0	2	0.101	6 Months
Selenium	7782-49-2	10	0.967	6 Months
Silver	7440-22-4	2	0.0531	6 Months
Zinc	7440-66-6	2	0.0785	6 Months

Method: SW7471 Mercury by CVAA in Solids
Preparation Method: SW7471
Standard Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (mg/kg)	MDL (mg/kg)	Holding Time
Mercury	7439-97-6	0.02	0.00873	28 Days

Method: Krone; Organotins by GC/MS Ion Trap
Preparation Method: Krone
Standard Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (ug/kg)	MDL (ug/kg)	Holding Time
Dibutyltin		2.88	0.7	N/A
Monobutyltin		2.71	0.56	N/A
Tetrabutyltin		6.67	2.18	N/A
Tributyltin	688-73-3	4.89	0.656	N/A

Method: Krone; Organotins by GC/MS
Matrix: Pore Water
Preparation Method: Krone
Standard Reporting Level
Sample Container: 1 liter of sediment in specialty polycarbonate bottle

Analyte	CAS Number	RL (ug/L)	MDL (ug/L)	Holding Time
Dibutyltin		0.00577	0.0008	N/A
Monobutyltin		0.00407	0.0004	N/A
Tetrabutyltin		0.01	0.002	N/A
Tributyltin	688-73-3	0.00733	0.0015	N/A

STL Seattle
Method Detection Limits & Reporting Limits for Sediments

Method: SW8260 Volatile Organics by GC-MS
Preparation Method: SW5035
Low Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (ug/kg)	MDL (ug/kg)	Holding Time
Trichloroethene	79-01-6	1	0.0321	14 Days
Tetrachloroethene	127-18-4	1	0.101	14 Days
Ethylbenzene	100-41-4	1	0.0247	14 Days
m,p-Xylenes	108-38-3 & 106-42-3	2	0.0843	14 Days
o-Xylene	95-47-6	1	0.03	14 Days

Method: SW8081 Organochlorine Pesticides by GC
Preparation Method: SW3550
Standard Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (ug/kg)	MDL (ug/kg)	Holding Time
4,4'-DDD	72-54-8	2	0.204	14 Days to Extract
4,4'-DDE	72-55-9	2	0.186	14 Days to Extract
4,4'-DDT	50-29-3	2	0.235	14 Days to Extract
Aldrin	309-00-2	1	0.103	14 Days to Extract
alpha-BHC	319-84-6	1	0.094	14 Days to Extract
alpha-Chlordane	5103-71-9	1	0.108	14 Days to Extract
Dieldrin	60-57-1	2	0.243	14 Days to Extract
gamma-BHC (Lindane)	58-89-9	1	0.12	14 Days to Extract
Heptachlor	76-74-8	1	0.082	14 Days to Extract
Hexachlorobenzene	118-74-1	4	0.89	14 Days to Extract
Hexachlorobutadiene	87-68-3	2	0.43	14 Days to Extract

Method: SW8082 PCB's by GC
Preparation Method: SW3550 Mod.
Standard Reporting Level
Sample Container: 4 oz. Soil Jar

Analyte	CAS Number	RL (ug/kg)	MDL (ug/kg)	Holding Time
Aroclor 1016	12674-11-2	0.1		14 Days to Extract
Aroclor 1221	11104-28-2	0.1		14 Days to Extract
Aroclor 1232	11141-16-5	0.1		14 Days to Extract
Aroclor 1242	53469-21-9	0.1	0.0162	14 Days to Extract
Aroclor 1248	12672-29-6	0.1		14 Days to Extract
Aroclor 1254	11097-69-1	0.1		14 Days to Extract
Aroclor 1260	11096-82-5	0.1	0.0295	14 Days to Extract

APPENDIX A

Puckett, Gwyn L NWS

From: Matthew Boyle [matthewb@gretteassociates.com]
Sent: Friday, June 03, 2005 10:17 AM
To: Puckett, Gwyn L NWS
Cc: Phil Best
Subject: RE: Port of Silverdale Sediment

Gwyn-

The differences in the proposed vs. actual sample depths are the consequence of the slight difference in sampling locations. We explain in Section 4 "Quality Assurance/Quality Control Report" that the dGPS signals were not available to the positioning was recorded using a total station EDM and a licensed surveyor (Section 2.5). Since the entire dredge prism is on a slope the depths of locations vary with the slightest change in position.

Please let me know if this answers your question or if you need anything else.

Sincerely,

Matthew Boyle
Senior Biologist/Principal
GRETTE ASSOCIATES,LLC
2111 N 30th
Tacoma, WA 98403
253-573-9300
253-573-9321 Fax

-----Original Message-----
From: Puckett, Gwyn L NWS [mailto:Gwyn.L.Puckett@nws02.usace.army.mil]
Sent: Friday, June 03, 2005 9:43 AM
To: Matthew Boyle
Cc: Shannon Bartkiw
Subject: RE: Port of Silverdale Sediment

Matthew,

I have one last question for you. There was some concern expressed at yesterday's DMMP meeting regarding sample depth. In particular are the differences in the proposed depths vs. the actual depths of the sample sites listed below.

Sample Site	Proposed Depth	Actual Depth
3	-1 to -3	-0.5 to -2.5
4	-6 to -8	-6 to -7.5
5	-4 to -7	-3 to -5
6	-3 to -5	-5 to -7

Please respond with explanation for the deviations from the sampling and analysis plan. As soon as I have received this I should be able to release the suitability determination.

Much thanks,

Gwyn Puckett
Benthic Ecologist
Dredged Materials Management Office
U.S. Army Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-3755

206-764-6184
gwyn.l.puckett@usace.army.mil

-----Original Message-----
From: Matthew Boyle [mailto:matthewb@gretteassociates.com]
Sent: Friday, May 27, 2005 10:38 AM
To: Puckett, Gwyn L NWS
Cc: Shannon Bartkiw
Subject: Port of Silverdale Sediment

Gwyn -

Please let me know if you need anything else for sediment recency for the Port of Silverdale maintenance dredge.

Thanks,

Matthew Boyle
Senior Biologist/Principal
GRETTE ASSOCIATES,LLC
2111 N 30th
Tacoma, WA 98403
253-573-9300
253-573-9321 Fax