

CENWS-OP-TS  
DREDGED MATERIAL MANAGEMENT OFFICE

MEMORANDUM FOR RECORD

September 12, 1997

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF DREDGED MATERIAL FROM THE U.S. OIL AND REFINING COMPANY (97-2-00858) FOR DISPOSAL AT THE PSDDA COMMENCEMENT BAY OPEN-WATER NONDISPERSIVE SITE.

1. The U.S. Oil and Refining Company proposes to dredge 15,071 cubic yards of sediment for maintenance and limited deepening at its oil transfer dock on the Blair Waterway in Tacoma. The following summary reflects the PSDDA agencies' (Corps of Engineers, Department of Ecology, Department of Natural Resources and the Environmental Protection Agency) suitability determination for disposal of this material at the PSDDA Commencement Bay open-water nondispersive site.
  2. A sampling and analysis plan (SEA, 1997a) was submitted to the PSDDA agencies on June 19, 1997 and approved in a letter from the Dredged Material Management Office dated July 3, 1997. Sediment sampling occurred on July 13, 1997.
  3. The project was ranked "high" by the PSDDA agencies on the basis of Table A.1 in PSDDA (1989) and previous PSDDA testing at this site (DMMO, 1990). Five dredged material management units (DMMUs) were characterized. Sediment from 8 sampling locations were composited into four surface (C1-C4) and one subsurface (C5) DMMUs [see Attachments 1 and 2].
  4. Sampling and analysis data were submitted to the PSDDA agencies on September 2, 1997 (SEA, 1997b). The chemistry data indicated that none of the DMMUs had any exceedances, either detected or undetected, of the PSDDA screening levels (SL). Therefore, bioassays were not required for any of the DMMUs.
  5. The sampling and analysis plan called for testing of interstitial water from DMMU C3 for tributyltin (TBT). However, due to the high sand content of this sample, much of the porewater freely drained from the vibracore tube as the sample was being retrieved. Consequently, an inadequate volume of porewater was available to conduct the planned testing. Striplin Environmental Associates notified the PSDDA agencies of this problem via the Dredged Material Management Office. The agencies agreed to allow bulk sediment analysis of TBT in lieu of interstitial testing and to base their decision on the theoretical interstitial concentration derived from the bulk sediment concentration.
- Tributyltin was undetected in the sediment sample at a detection limit of 10.7 ug/kg (as TBT). The theoretical interstitial concentration was calculated using the dry-weight TBT

concentration, the total organic carbon fraction, and a partitioning factor of 25,000 liters/kg<sub>oc</sub> as follows:

$$\begin{aligned} \text{dry weight TBT} &= 10.7 \text{ ug / kg (as TBT)} \\ \text{and TOC} &= 0.42 \text{ percent} \\ \text{therefore interstitial TBT} &= \frac{\left( \frac{10.7 \text{ ug TBT / kg}_{\text{sed}}}{0.0042 \text{ kg}_{\text{oc}} / \text{kg}_{\text{sed}}} \right)}{25,000 \text{ liters / kg}_{\text{oc}}} = .10 \text{ ug / l (as TBT)} \end{aligned}$$

This did not exceed the PSDDA threshold of 0.15 ug/l. Therefore, no further testing was required for TBT.

6. In summary, the PSDDA-approved sampling and analysis plan was followed, with the exception of TBT testing as noted in paragraph 5. The sampling and testing data met PSDDA quality assurance/quality control guidelines and were deemed sufficient and acceptable for regulatory decision-making under the PSDDA program. Based on the results of the chemical testing, the following consensus determination was made by the PSDDA agencies:

All 15,071 cubic yards proposed for dredging from the U.S. Oil and Refining Company's oil transfer dock are suitable for disposal at the Commencement Bay open-water nondispersive site.

7. The chemical quality of the proposed dredged material was also evaluated for potential beneficial use. Chemical concentrations were compared to the State of Washington Sediment Quality Standards (SQS) and there were no *detected* exceedances.

While all dry-weight detection limits were below the PSDDA SLs, there were carbon-normalized detection limit exceedances of the SQS for 1,2,4-trichlorobenzene, hexachlorobenzene and total PCBs [Attachment 3]. However, it should be noted that the carbon content of DMMUs C1, C3 and C5 was below 0.5 percent, thereby driving up the carbon-normalized detection limits for these DMMUs. If carbon-normalized detection limits for C1, C3 and C5 are discounted, the only chemical with a carbon-normalized detection limit above SQS is hexachlorobenzene. When the dry-weight detection limit for hexachlorobenzene was compared to the draft July 1996 detection limit guidelines provided by the Department of Ecology [Attachment 4], the guideline for hexachlorobenzene was not exceeded.

The PSDDA agencies agreed that the potential risk for deleterious adverse effects posed by these detection limit exceedances is negligible. Therefore, the PSDDA agencies used best professional judgment in determining that all project sediments are

chemically suited for unrestricted beneficial use. Attachment 5 provides sediment conventional data for the evaluation of beneficial use options.

8. Based on the high rank for this project and the potential for hydrocarbon contamination from transfer and storage operations at this facility, under PSDDA recency guidelines the data collected for the full characterization of project sediments are valid for 2 years after the sampling date. If a "changed condition" (e.g. after a spill event) occurs between the date of this suitability determination and the time of dredging, the PSDDA agencies will determine whether additional sampling and testing are required prior to dredging.

9. This memorandum documents the suitability of proposed dredged sediments for disposal at the Commencement Bay open-water site and the chemical suitability for beneficial use. It does not constitute final agency approval of the project. During the public comment period which follows a public notice, the resource agencies will provide input on the overall project. 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:

9/12/97  
Date

David F. Fox  
David Fox, PE  
Seattle District Corps of Engineers

15 Sept 97  
Date

John Malek  
John Malek  
Environmental Protection Agency, Region X

9-16-97  
Date

Vernice Santee  
Vernice Santee  
Washington Department of Ecology

16 SEP 97  
Date

Ted A. Benson  
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cc: Ted Benson/Brent Brigham/John Malek/Claudia Quate/Gene Revelas/Vernice Santee

## References

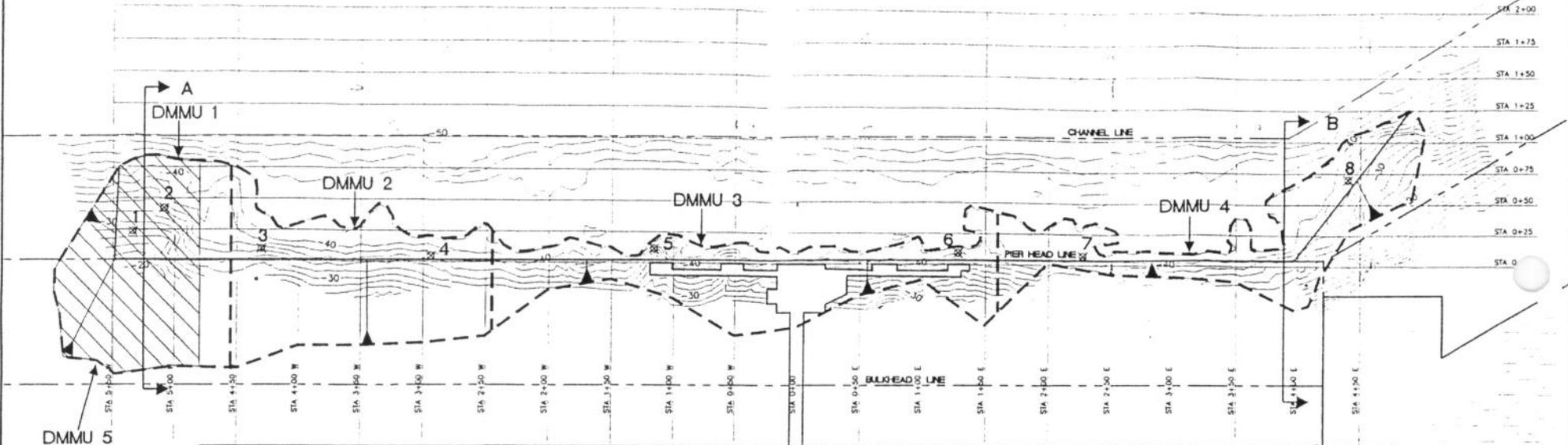
DMMO, 1990, *Memorandum for Record, 16 August 1990, Decision on the Suitability of Dredged Material Tested Under PSDDA Criteria for the US Oil & Refining Company Maintenance Dredging Project (OYB-2-013226) to be Disposed of at the Commencement Bay Open-water Disposal Site*, prepared by the Dredged Material Management Office for the PSDDA agencies.

PSDDA, 1989, *Management Plan Report, Unconfined Open-Water Disposal of Dredged Material, Phase II*. Prepared by the PSDDA agencies.

SEA, 1997a, *Sampling and Analysis Plan for PSDDA Sediment Characterization, U.S. Oil and Refining Company, Tacoma, Washington*, Prepared by Striplin Environmental Associates, Inc., Tacoma, Washington.

SEA, 1997b, *PSDDA Sediment Characterization Report, U.S. Oil and Refining Company, Tacoma, Washington*, Prepared by Striplin Environmental Associates, Inc., Tacoma, Washington.

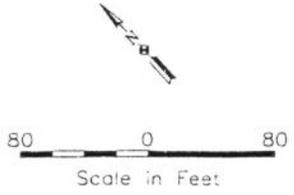
BLAIR WATERWAY



DMMU 5 (SUBSURFACE)

-  SURFACE MATERIAL - DREDGED MATERIAL MANAGEMENT UNIT
-  SUBSURFACE MATERIAL - DREDGED MATERIAL MANAGEMENT UNIT
-  BOUNDARY OF DREDGED MATERIAL MANAGEMENT UNIT
-  PROPOSED SAMPLE LOCATION

- GENERAL NOTES:
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NAD 27 SOUTH ZONE
  2. VERTICAL DATUM: MEAN LOWER LOW WATER (MLLW)
  3. PROPERTY LINE AND MITIGATION AREA TAKEN FROM SITTS AND HILL ENGINEERS, INC. DRAWING NO. 80361EXB DATED 2/1/94.
  4. POSITIONAL ACCURACY OF PROPERTY LINES AND MITIGATION AREA MAY BE ±5 ft DUE TO THE FACT THAT SURVEY CONTROL COULD NOT BE VERIFIED.
  5. SOUNDINGS INDICATE, IN FEET, DEPTHS BELOW MEAN LOWER LOW WATER.
  6. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON 1/15/97 AND 4/30/97 BY DAVID EVANS AND ASSOCIATES AND CAN ONLY BE CONSIDERED AS AN INDICATION OF THE GENERAL CONDITION EXISTING AT THAT TIME. CONTOURS ARE CROPPED TO SURVEY EXTENTS - SLOPE DATA BEYOND SURVEY EXTENTS EXTRAPOLATED AND NOT TO BE USED FOR PURPOSES OTHER THAN PRELIMINARY VOLUME CALCULATIONS.



MITIGATION AREA

**HARTMAN CONSULTING CORP.**



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PROJECT US OIL  
FILE DMMU\_R1  
DATE 6/9/97

SAMPLING AND ANALYSIS PLAN  
U.S. OIL  
PLAN VIEW

Attachment 1

Attachment 2  
 U.S. Oil & Refining  
 97-2-00858  
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Sampling and Compositing

DMMU	DMMU Type	Volume (CY)	Sampling Stations	Mudline Elevation (ft)	Sampling Depth (ft)
C1	Surface	3,529	1	-27	-27 to -31
			2	-35	-35 to -39
C2	Surface	3,929	3	-35	-35 to -42
			4	-37	-37 to -42
C3	Surface	1,714	5	-39	-39 to -42
			6	-40	-40 to -42
C4	Surface	1,968	7	-42	-40 to -42
			8	-36	-36 to -42
C5	Subsurface	3,931	1	-27	-31 to -40
			2	-35	-39 to -42
Total:		15,071			

Attachment 3  
U.S. Oil & Refining  
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**Detection Limit Comparisons**

<i>Chemical</i>	<i>Guidelines for Comparison</i>		<i>Detection Limits Exceeding Listed Guidelines</i>				
	SQS (mg/kg oc)		C1	C2	C3	C4	C5
Hexachlorobenzene	0.38		2.4	1.6	2.6	1.1	2.6
1,2,4-Trichlorobenzene	0.81		1.2		1.2		1.3
Total PCBs	12.0		15.9				9.2
<i>Chemical</i>	Draft 1996 SMS DL (ug/kg dw)	PSDDA SL (ug/kg dw)					
Hexachlorobutadiene	11	29	13	14	14	15	14
Aroclor 1016	6	*	16	8.6	8.9	9.3	8.7
Aroclor 1221	6	*	65	34	36	37	35
Aroclor 1232	6	*	16	8.6	8.9	9.3	8.7
Aroclor 1242	6	*	16	8.6	8.9	9.3	8.7
Aroclor 1248	6	*	16	8.6	8.9	9.3	8.7
Aroclor 1254	6	*	16	8.8	13	16	8.7
Aroclor 1260	6	*	16	8.6	8.9	9.3	8.7
<i>Chemical</i>	1988 LAET (ug/kg dw)	PSDDA SL (ug/kg dw)					
Hexachlorobutadiene	11	29	13	14	14	15	14

\* SL for Total PCBs = 130 ug/kg dw  
 SQS = Sediment Quality Standards  
 SMS = Sediment Management Standards  
 DL = Detection Limit  
 LAET = Lowest Apparent Effects Threshold

oc = organic-carbon-normalized  
 dw = dry-weight-normalized

Table 5. Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Detection Limits For Sediment Management Standards, Chapter 173-204 WAC  
Draft - July 1996

					Recommended Detection Limits (ug/kg dry weight)
<b>Chlorinated Benzenes</b>					
1,2 Dichlorobenzene	3540/3550	3640/3660	8270/1625C	35*	DWLAET, LAET/3 <8270
1,4 Dichlorobenzene	3540/3550	3640/3660	8270/1625C		37
1,2,4 Trichlorobenzene	3540/3550	3640/3660	8270/1625C	31*	DWLAET, LAET/3 <8270
Hexachlorobenzene	3540/3550	3640/3660	8270/1625C	22*	DWLAET, LAET/3 <8270
<b>Phthalate Esters</b>					
Dimethyl phthalate	3540/3550	3640/3660	8270/1625C		24
Diethyl phthalate	3540/3550	3640/3660	8270/1625C		67
Di-n-butyl phthalate	3540/3550	3640/3660	8270/1625C		467
Butyl benzyl phthalate	3540/3550	3640/3660	8270/1625C		This LAET/3 is close to 21 8270 # of 16
Bis[2 ethylhexyl]phthala	3540/3550	3640/3660	8270/1625C		433
Di n octyl phthalate	3540/3550	3640/3660	8270/1625C		2067
<b>Misc. Extractable Comp's.</b>					
Dibenzofuran	3540/3550	3640/3660	8270/1625C		180
Hexachlorobutadiene	3540/3550	3640/3660	8270/1625C	11*	DWLAET, LAET/3 <8270 #=27
N-nitrosodiphenylamine	3540/3550	3640/3660	8270/1625C	28*	This # = DWLAET, LAET/3 <8270 #=27
<b>PCBs</b>					
Individual PCB Aroclors®	3540/3550	3620/3640/3660	8080		Agreed w/Metro&SM 6 U
<b>Ionizable Org. Comp's.</b>					
Phenol	3540/3550	3640/3660	8270/1625C		140
2 Methylphenol	3540/3550	3640/3660	8270/1625C	63*	DWLAET, LAET/3 <8270 #=27
4 Methylphenol	3540/3550	3640/3660	8270/1625C		223
2,4 Dimethylphenol	3540/3550	3640/3660	8270/1625C	29*	DWLAET, LAET/3 <8270 #=27
Pentachlorophenol	3540/3550	3640/3660	8270/1625C		120
Benzyl alcohol	3540/3550	3640/3660	8270/1625C	57*	DWLAET, LAET/3 <8270 #=27
Benzoic acid	3540/3550	3640/3660	8270/1625C		217

Attachment 4

Table 5. Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Detection Limits For Sediment Management Standards, Chapter 173-204 WAC  
Draft - July 1996

	Recommended Sample Preparation Methods	Recommended Sample Cleanup Methods	Recommended Analytical Methods	Recommended Detection Limits (mg/kg dry weight)	RDLs are all assumed to be the DWLAET/3 unless otherwise noted
<b>Metals</b>					
Arsenic	PSEP	--	6010/7061	19	
Cadmium	PSEP	--	6010/7131	1.70	
Chromium	PSEP	--	6010/7191	87	benae/3, only 2 aet
Copper	PSEP	--	6010	130	
Lead	PSEP	--	6010/7421	150	
Mercury	#NAME?	--	7471	0.14	
Silver	PSEP	--	6010	2	
Zinc	PSEP	--	6010	137	
<b>Nonionizable Organic Compounds</b>					
<b>LPAH Compounds</b>					
Naphthalene	3540/3550	3640/3660	8270/1625C	700	
Acenaphthylene	3540/3550	3640/3660	8270/1625C	433	
Acenaphthene	3540/3550	3640/3660	8270/1625C	167	
Fluorene	3540/3550	3640/3660	8270/1625C	180	
Phenanthrene	3540/3550	3640/3660	8270/1625C	500	
Anthracene	3540/3550	3640/3660	8270/1625C	320	
2 Methyl naphthalene	3540/3550	3640/3660	8270/1625C	223	
<b>HPAH Compounds</b>					
Fluoranthene	3540/3550	3640/3660	8270/1625C	567	
Pyrene	3540/3550	3640/3660	8270/1625C	867	
Benz[a]anthracene	3540/3550	3640/3660	8270/1625C	433	
Chrysene	3540/3550	3640/3660	8270/1625C	467	
Total benzofluoranthene	3540/3550	3640/3660	8270/1625C	1067	
Benzo[a]pyrene	3540/3550	3640/3660	8270/1625C	533	
Indeno[1.2.3 cd]pyrene	3540/3550	3640/3660	8270/1625C	200	
Dibenz[a,h]anthracene	3540/3550	3640/3660	8270/1625C	77	
Benzo[ghi]perylene	3540/3550	3640/3660	8270/1625C	223	

Attachment 4 (cont.)

**Attachment 5**  
**U.S. Oil & Refining**  
**97-2-00858**  
**September 12, 1997**

**Sediment Conventional Data**

	C1	C2	C3	C4	C5
total solids (%)	82.7	82.1	81.3	78.5	80.4
total volatile solids (%)	1.49	1.37	1.66	1.75	1.37
total organic carbon (%)	0.41	0.62	0.42	0.96	0.38
ammonia (mg/kg)	1.2 U	1.2 U	1.5	3.0	13
total sulfides (mg/kg)	10 U	10 U	10 U	10	10 U
gravel (%)	1.0	2.2	1.1	0.9	6.0
sand (%)	81.9	80.3	75.5	79.9	21.5
silt (%)	13.4	14.2	20.5	14.3	71.3
clay (%)	3.5	3.3	2.8	4.8	1.0