

Operations Division  
Technical Support Branch  
Dredged Material Management Office

July 7, 1997

**MEMORANDUM FOR RECORD:**

**SUBJECT: DMMP AGENCY DETERMINATION ON THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE FORT WORDEN MARINA BOAT BASIN, PORT TOWNSEND (96-2-02069) FOR EITHER DISPOSAL AT THE PORT TOWNSEND OPEN-WATER DISPOSAL SITE AND/OR PLACEMENT AT A BENEFICIAL USES "BEACH RENOURISHMENT" SITE.**

1. This memorandum documents the DMMP agency determination regarding the suitability of approximately 3,000 cubic yards of material proposed for dredging from the Fort Worden Marina Boat Basin, Port Townsend for disposal at a PSDDA open-water disposal site, and/or potential placement of this material at a beach renourishment site as a beneficial uses application.
2. The applicant's contractor (Hart Crowser) submitted a sampling and analysis plan (SAP) for review and the SAP was approved by the PSDDA agencies on December 16, 1997. Sampling was completed on February 10, 1997, and analysis results are found in Hart Crowser's Final Report dated March 19, 1997. This report was not initially submitted to the Dredged Material Management Office for PSDDA agency review, and this caused a significant delay in the agency review of the sampling / analysis results. The agencies finally received the data report for review on 26 June 1997. Relevant dates for regulatory tracking purposes are included in Table 1.

**Table 1. Regulatory Tracking Dates**

SAP Approval date	December 16, 1996
Sampling date(s):	February 10, 1997
Data report submittal date	June 26, 1997
<b>Recency Determination Dates:</b> Low-Moderate Concern DMMU (5-7 years)	February 2002 - 2004

3. Examination of the data in both PSDDA format (dry weight normalization) and Sediment Management Standards sediment quality standards format confirmed the high quality of the sediments. Chemical analysis results indicated the sandy material (99% sand) had no exceedances of PSDDA screening levels (Table 2), and no exceedances of the SMS-SQS (Table 3). The TOC content was very low at 0.058%.

This makes analyzing the carbon normalized chemistry results somewhat problematic. Under the SMS guidelines, low organic carbon values less than 0.5% can lead to arbitrary exceedances of the sediment management standards. In those instances caution should be exercised when comparing carbon normalized chemistry to SMS criteria. However, carbon normalized analysis results indicated that all chemicals were below SQS criteria.

4. The Agencies concluded based on the above discussion of testing results that all 3,000 cy of this material is suitable for either disposal at a PSDDA open-water disposal site (e.g., Port Townsend) or for use at a beneficial uses nearshore beach renourishment site.
5. This memorandum documents the suitability of proposed dredged sediments for placement at either a PSDDA open-water disposal site and/or at a potential nearshore beneficial uses site. 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.

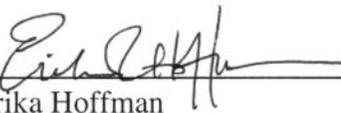
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**Concur:**

17 July 1997  
Date

  
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David R. Kendall, Ph.D  
Seattle District Corps of Engineers

17 July 1997  
Date

  
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Erika Hoffman  
Environmental Protection Agency  
Region 10

11 July 97  
Date

  
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Maria Peeler  
Washington Department of Ecology

11 JUL 97  
Date

  
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DMMO file

Table 2 - Comparison of Analytical Results to PSDDA Criteria

Analyte	PSDDA		HC-FW-A
	SL	ML	
<b>Conventionals</b>			
Total Volatile Solids in %	-	-	0.74
Ammonia as Nitrogen in mg/kg	-	-	0.1 U
Total Sulfide in mg/kg	-	-	2.9 J
Total Organic Carbon in %	-	-	0.058
<b>Metals in mg/kg (dry)</b>			
Antimony	20	200	0.27 U
Arsenic	57	700	1.1
Cadmium	0.96	9.6	0.034
Copper	81	810	7.5
Lead	66	660	2.3
Mercury	0.21	2.1	0.11 U
Nickel	140	-	36
Silver	1.2	6.1	0.016
Zinc	160	1600	21
Tributyltin as TBT in µg/kg (dry)	73 (1)		2
<b>LPAHs in µg/kg (dry)</b>			
Naphthalene	210	2100	18.56 U
Acenaphthylene	64	640	3.36 U
Acenaphthene	63	630	3.71 U
Fluorene	64	640	4.18 U
Phenanthrene	320	3200	3.48 J
Anthracene	130	1300	1.16 J
2-Methylnaphthalene	67	670	17.98 U
Total LPAHs (2)	610	6100	4.64
<b>HPAHs in µg/kg (dry)</b>			
Fluoranthene	630	6300	8.12 J
Pyrene	430	7300	10.44 J
Benzo(a)anthracene	450	4500	3.60 J
Chrysene	670	6700	8.70 J
Total Benzofluoranthenes	800	8000	11.02 J
Benzo(a)pyrene	680	6800	3.77 J
Indeno(1,2,3-cd)pyrene	69	5200	2.38 J
Dibenzo(a,h)anthracene	120	1200	6.96 U
Benzo(g,h,i)perylene	540	5400	2.67 J
Total HPAHs (3)	1800	51000	50.70

2  
Table 4 - Comparison of Analytical Results to PSDDA Criteria

Analyte	PSDDA		HC-FW-A
	SL	ML	
<b>Semivolatiles in µg/kg (dry)</b>			
Dibenzofuran	54	540	3.71 U
Hexachloroethane	1400	14000	20.30 U
Hexachlorobenzene (4)	23	230	0.003 U
Hexachlorobutadiene (4)	29	290	0.003 U
N-nitrosodiphenylamine	28	220	4.41 U
Dimethylphthalate	160	-	7.54 U
Diethylphthalate	97	-	8.70 U
Di-n-butylphthalate	1400	-	25.52 U
Butylbenzylphthalate	470	-	1.74 J
Bis(2-ethylhexyl)phthalate	3100	-	16.24 J
Di-n-octylphthalate	6200	-	31.32 U
Phenol	120	1200	1.9 UJ
2-Methylphenol	20	72	18 U
4-Methylphenol	120	1200	19 U
2,4-Dimethylphenol	29	50	17 U
Pentachlorophenol	100	690	32 U
Benzyl Alcohol	25	73	14 U
Benzoic Acid	400	690	35 UJ
1,2 -Dichlorobenzene	19	350	2 U
1,3- Dichlorobenzene	170	-	2 U
1,4-Dichlorobenzene	26	260	2 U
1,2,4-Dichlorobenzene	13	64	5 U
<b>Pesticide/PCBs in mg/kg (dry)</b>			
Total PCBs (5)	130	2500	0.05 <del>0.051 U</del>
Total DDT	6.9	69	0.0054 U
Aldrin	10	-	0.0027 U
Chlordane	10	-	0.0054 U
Dieldrin	10	-	0.0054 U
Heptachlor	10	-	0.0027 U
Lindane	10	-	0.0027 U
<b>Volatiles in µg/kg (dry)</b>			
Ethylbenzene	10	50	2 U
Tetrachloroethene	140	210	2 U
Trichloroethene	160	1600	2 U
Total Xylenes	12	160	2 U

(1) PSDDA Program Guideline, September 1989.

(2) Total LPAH represents the sum of the low molecular weight aromatics. Total LPAH is calculated as the sum of detected results or as the highest non-detected value if results are not detected.

(3) Total HPAH represents the sum of the high molecular weight aromatics. Total HPAH is calculated as the sum of detected results or as the highest non-detected value if results are not detected.

(4) Analyzed using EPA Method 8080.

(5) Total PCBs is calculated as the sum of detected results or as the highest non-detected values if results are not detected.

SL = Screening Level

ML = Maximum Level

U = Not detected

J = Estimated value

Table 3 - Comparison of Analytical Results to SQS Criteria

	SQS	MCUL	HC-FW-A
<b>Conventionals</b>			
Total Volatile Solids in %	-	-	0.74
Ammonia as Nitrogen in mg/kg	-	-	0.1 U
Total Sulfide in mg/kg	-	-	2.9 J
Total Organic Carbon in %	-	-	0.058
<b>Metals in mg/kg (dry)</b>			
Arsenic	57	93	1.1
Cadmium	5.1	6.7	0.034
Copper	390	390	7.5
Lead	450	530	2.3
Mercury	0.41	0.59	0.11 U
Silver	6.1	6.1	0.016
Zinc	410	960	21
<b>LPAHS in mg/kg (OC)</b>			
Naphthalene	99	170	32 U
Acenaphthylene	66	66	5.8 U
Acenaphthene	16	57	6.4 U
Fluorene	23	79	7.2 U
Phenanthrene	100	480	6 J
Anthracene	220	1200	2 J
2-Methylnaphthalene	38	64	31 U
Total LPAHs (1)	370	780	8
<b>HPAHs in mg/kg (OC)</b>			
Fluoranthene	160	1200	14 J
Pyrene	1000	1400	18 J
Benzo(a)anthracene	110	270	6.2 J
Chrysene	110	460	15 J
Total Benzofluoranthenes	230	450	19 J
Benzo(a)pyrene	99	210	6.5 J
Indeno(1,2,3-cd)pyrene	34	88	4.1 J
Dibenzo(a,h)anthracene	12	33	12 U
Benzo(g,h,i)perylene	31	78	4.6 J
Total HPAHs (2)	960	5300	87.4

**Table 3 - Comparison of Analytical Results to SQS Criteria**

	SQS	MCUL	HC-FW-A
<b>Semivolatiles in mg/kg (OC)</b>			
Dibenzofuran	15	58	6.4 U
N-nitrosodiphenylamine	11	11	7.6 U
Hexachlorobenzene (3)	0.38	2.3	0.0047 U
Hexachlorobutadiene (3)	3.9	6.2	0.0047 U
Dimethylphthalate	53	53	13 U
Diethylphthalate	61	110	15 U
Di-n-butylphthalate	220	1700	44 U
Butylbenzylphthalate	4.9	64	3 J
Bis(2-ethylhexyl)phthalate	47	78	28 J
Di-n-octylphthalate	58	4500	54 U
<b>Semivolatiles in µg/kg (dry)</b>			
Phenol	420	1200	1.9 UJ
2-Methylphenol	63	63	18 U
4-Methylphenol	670	670	19 U
2,4-Dimethylphenol	29	29	17 U
Pentachlorophenol	360	690	32 U
Benzyl Alcohol	57	73	14 U
Benzoic Acid	650	650	35 UJ
<b>Total PCBs in mg/kg (OC) (4)</b>	12	65	0.93 U

- (1) The LPAH criteria represents the sum of the low molecular weight aromatics. Total LPAH is calculated as the sum of detected results or as the highest non-detected value if results are not detected.
- (2) The HPAH criteria represents the sum of the high molecular weight aromatics. Total HPAH is calculated as the sum of detected results or as the highest non-detected value if results are not detected.
- (3) Analyzed using EPA Method 8080.
- (4) Total PCBs is calculated as the sum of detected results or as the highest non-detected values if results are not detected.

Chlorinated benzene results were compared to PSDDA screening criteria only.

SQS = Sediment Quality Standard

MCUL = Maximum Cleanup Level

U = Not detected

J = Estimated value