CENWS-OD-TS-DMMO **22 September 20008**

MEMORANDUM FOR RECORD

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE PORT TOWNSEND MARINA NAVIGATION CHANNEL, JEFFERSON COUNTY, FOR BENEFICIAL USE OR UNCONFINED OPEN WATER DISPOSAL AT THE PORT TOWNSEND OPEN WATER DISPOSAL SITE

1. Introduction. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the U.S. Environmental Protection Agency) regarding the suitability of up to 1,250 cubic yards of dredged material from the Port Townsend Marina Navigation Channel for beneficial use or disposal at the Port Townsend open-water disposal site.

2. Background. The Port Townsend Marina is located on Admiralty Inlet. The upland area is residential with limited history of industrial development. Marinas are ranked moderate under DMMP guidelines. The marina is used by recreational boaters for moorage and as moorage for Coast Guard vessels. The Corps of Engineers is proposing to dredge and remove accumulated sediment to maintain -12 feet MLLW depth to accommodate marina boating activities. In addition, a small area (approximately 400 cubic yards) is proposed for dredging to allow better access for Coast Guard vessels. This area has not been previously dredged.

3. Project Summary. Table 1 includes project summary and tracking information.

Table 1. Project Summary

Project ranking	Moderate
Proposed Dredging volume	1,250 cubic yards
Proposed Dredging depth	-12 feet MLLW
SAP Received	24 June 2008
SAP Approved	26 June 2008
Sampling Dates	2, 8 and 10 July 2008
Data report received	2 September 2008
DAIS Tracking Number	PTMAR -1-A-F-260
USACE Public Notice Number	CENWS-OD-TS-NS-29
Recency Determination (Moderate = 5 to 7 Years)	10 July 2013 – 10 July 2015

4. Project Sampling. Core samples were taken from six locations using a vibracore, and composited for two analyses. Three samples from the new work area were

composited for analysis CH1 and three samples from the existing channel maintenance area were composited for sample CG2. Z-samples were also collected from all core locations and archived. The sampling and compositing scheme is outlined in Table 2. Sample locations are illustrated in Figure 1.

5. Chemical Analysis. Sediment conventional results are listed in Table 3. The material is predominantly medium to fine-grained sand. Sediments were evaluated for the standard list of DMMP chemicals of concern and for tributyltin (TBT) and dioxins/furans. Dioxin analysis was required due to the presences of historical pulp mill operations in the vicinity of the project.

There were no exceedances of DMMP screening guidelines for the standard chemicals of concern and for TBT. Bioassay testing was not required. Sediment chemistry results are listed in Table 4.

Dioxin Results: Project sediments were analyzed for the presence of dioxins/furans. In sample CH1, the total dioxin/furan TEQ was 4.71 parts per trillion and for sample CG1, the total dioxin/furan TEQ was 1.36 parts per trillion. Congener-specific results are provided in Table 5. In 2007 the DMMP agencies formulated interim dioxin disposal guidelines for dispersive disposal sites in Puget Sound, including the Port Townsend site. The interim guidelines involve comparing each DMMU in a project to a dioxin concentration representing background. Background is defined using sediment data from the closest accepted DMMP reference area. In the case of the Port Townsend project, the closest reference site is Samish Bay. Dioxin data from Samish Bay was recently collected for the Cap Sante Marina recency determination. The dioxin concentration measured in a single sediment sample from Samish Bay was 2.44 parts per trillion TEQ (*DMMP 2008*). Based on the comparison of the project data to this reference, 400 cubic yards of sediment from DMMU CH1 is not suitable for disposal at the Port Townsend dispersive site.

The approved sampling and analysis plan was followed and quality control guidelines specified by the PSEP and DMMP guidelines were met. The data were considered sufficient and acceptable for regulatory decision-making.

6. Suitability Determination. This memorandum documents the evaluation of the suitability of sediment proposed for dredging from Port Townsend Marina Navigation Channel. The approved sampling and analysis plan was followed. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program.

Based on the results of the previously described testing, the DMMP agencies conclude 850 cubic yards of material from DMMU CG2 are suitable for disposal at the Port Townsend open-water disposal site or for beneficial use. The 400 cubic yards of material from DMMU CH1 are unsuitable for disposal at the Port Townsend open-water disposal site.

7. Reference

DMMP. 2008. *Memorandum for Record. Determination on the Recency Extension Suitability of Dredged Material Characterized at the Cap Sante Boat Haven-West Basin Redevelopment Project (2002-00422) Under Section 404 of the Clean Water Act for the Purpose of Determining the Suitability of the Dredged Material for Open-water Disposal at a DMMP Dispersive Disposal Site.* Prepared by the US Army Corps of Engineers for the DMMP agencies. January 2008.

8. Agency Signatures.

Concur:

11/3/08 — Date — Stephanie Stirling, Seattle District Corps of Engineers

11/6/08 — Date — Erika Hoffman, Environmental Protection Agency

11/06/2008 — Date — Laura Inouye, Ph.D., Washington Department of Ecology

11/6/08 — Date — Courtney Wasson, Washington Department of Natural Resources

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DMMP Agencies
Tom Szelest, Corps Navigation
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Table 2. Sample Compositing Scheme

DMMU Number	Sample Core Sections	DMMU Volume (cubic yards)
CH1	CH1-1, CH1-2 CH1-3	400
CG2	CG2-4, CG2-5 CG2-6	850

Table 3. Sediment conventional results

DMMU		CH1	CG2
# of samples in composite		3	3
Volume (cubic yards)		400	850
GRAIN SIZE	% Gravel	0.3	0.3
	% Sand	93.6	94.9
	% Silt	3.6	3.4
	% Clay	2.5	1.3
	(clay+silt) % Fines	6.1	4.7
Total Solids, %		68	75
Volatile Solids, %		0.01	0.01
Total Organic Carbon, %		1.1	0.54
Total Sulfides, mg/kg		3.3	36
Total Ammonia, mg N/kg		17	9.7

Table 4. Chemical results compared to DMMP regulatory guidelines.

Sample ID				CH1		CG2	
Analyte	*SL*	*BT*	*ML*		LQ		LQ
Metals (ug/kg)							
Antimony	150	---	200	0.07		0.08	
Arsenic	57	507.1	700	2.55		2.18	
Cadmium	5.1	11.3	14	0.208		0.129	
Chromium	---	267	---	16.5		13.2	
Copper	390	1027	1300	7.76		7.03	
Lead	450	975	1200	5.53		5.25	
Mercury	0.41	1.5	2.3	0.024		0.017	
Nickel	140	370	370	22.4		19.5	
Selenium	---	3	---	0.4	B	0.4	B
Silver	6.1	6.1	8.4	0.056		0.042	
Zinc	410	2783	3800	20.9		17.6	
Butyltins[1]							
Porewater Butyltins (µg/L)	0.15	0.15	---	0.012	U	0.03	U
Low-Molecular PAHs (ug/kg)							
Naphthalene	2100	---	29000	33		4.6	J
Acenaphthylene	560	---	1300	5.1		12	
Acenaphthene	500	---	2000	11		4.2	J
Fluorene	540	---	3600	16		17	
Phenanthrene	1500	---	21000	45		130	
Anthracene	960	---	13000	24		35	
2-Methylnaphthalene	670	---	1900	7.5		2.7	J
Total LPAHs	5200	---	29000	134.1		202.8	
High-Molecular PAHs (ug/kg)							
Fluoranthene	1700	4600	30000	83		280	
Pyrene	2600	11980	16000	230		340	
Benzo[a]anthracene	1300	---	5100	29		110	
Chrysene	1400	---	21000	48		110	
Benzofluoranthenes	3200	---	9900	130		180	
Benzo[a]pyrene	1600	---	3600	48		110	
Indeno[1,2,3-c,d]pyrene	600	---	4400	49		67	
Dibenzo[a,h]anthracene	230	---	1900	3	U	31	
Benzo[g,h,i]perylene	670	---	3200	24		50	
Total HPAHs	12000	---	69000	641		1278	
Chlorinated Hydrocarbons							
1,3-Dichlorobenzene	170	---	---	3	U	2	U
1,4-Dichlorobenzene	110	---	120	1,9	U	1.9	U
1,2-Dichlorobenzene	35	---	110	4.2	U	4.2	U
1,2,4-Trichlorobenzene	31	---	64	2.5	U	2.4	U
Hexachlorobenzene	22	168	230	2.7	U	2.7	U
Phthalates							
Dimethyl Phthalate	71	---	1400	1.9	U	1.9	U
Diethyl Phthalate	200	---	1200	3.9	J	3.9	J
Di-n-butyl Phthalate	1400	---	5100	9.9	J	8.4	J
Butyl Benzyl Phthalate	63	---	970	11	J	9	J
Bis[2-ethylhexyl]phthalate	1300	---	8300	60	U	59	U
Di-n-octyl Phthalate	6200	---	6200	8.2	U	8.1	U
Phenols							
Phenol	420	---	1200	6.7	U	6.6	U
2-Methylphenol	63	---	77	7	U	6.8	U
3 & 4-Methylphenol	670	---	3600	13	U	13	U
2,4-Dimethylphenol	29	---	210	4.7	U	4.6	U

Pentachlorophenol	400	504	690	7.7	U	7.6	U
Miscellaneous Extractables							
Benzyl Alcohol	57	---	870	7.5	U	7.3	U
Benzoic Acid	650	---	760	580	J	550	J
Dibenzofuran	540	---	1700	11	J	4.2	U
Hexachloroethane	1400	---	14000	5.2	U	5.1	U
Hexachlorobutadiene	29	---	270	3.2	U	3.2	U
N-Nitrosodiphenylamine	28	---	130	3.7	U	2.7	U
Volatile Organics							
Trichloroethene	160	---	1600	0.2	U	1.1	U
Tetrachloroethane	57	---	210	0.11	U	1.1	U
Ethylbenzene	10	---	50	0.17	U	1.1	U
Total Xylene	40	---	160	0.18		0.18	
Pesticides (ug/kg)							
Total DDT	6.9	50	69	3.7	J	0.52	J
4,4'-DDE	---	---	---	2.6		0.52	J
4,4'-DDD	---	---	---	1.1	J	0.26	U
4,4'-DDT	---	---	---	0.26	U	0.26	U
Aldrin	10	---	---	0.1	U	0.11	U
Chlordane	10	37	---	0.12	U	0.12	U
Dieldrin	10	---	---	0.21	U	0.22	U
Heptachlor	10	---	---	0.13	U	0.13	U
Lindane	10	---	---	0.11	U	0.38	J
Aroclor 1016	---	---	---	5.6	U	5.7	U
Aroclor 1221	---	---	---	5.6	U	5.7	U
Aroclor 1232	---	---	---	5.6	U	5.7	U
Aroclor 1242	---	---	---	5.6	U	5.7	U
Aroclor 1248	---	---	---	5.6	U	5.7	U
Aroclor 1254	---	---	---	1.4	U	1.5	U
Aroclor 1260	---	---	---	1.4	U	1.5	U
Total PCBs (mg/kg OC)	130	38*	3100	5.6	U	5.7	U

U = undetected
J = estimated value: concnetration is less than method reporting limit but greater than method detection limit
QL = laboratory qualifier
OC = organic carbon
SL = screening level
BT = bioaccumulation trigger
ML = maximum level

Table 5. Congener-specific Dioxin Data					
Station Number		PT08-CHI-1-3-S		PT08-CG2-4-6-S	
	TEF		LQ		LQ
pg/g Dioxin/Furan DW					
2,3,7,8-TCDD	1	0.222	J	0.056	U
1,2,3,7,8-PECDD	1	1.07	J	0.301	J
1,2,3,4,7,8-HXCDD	0.1	1.13	J	0.25	U
1,2,3,6,7,8-HXCDD	0.1	5.17		1.88	J
1,2,3,7,8,9-HXCDD	0.1	3.27	J	1.15	J
1,2,3,4,6,7,8-HPCDD	0.01	84.4		32.4	
OCDD	0.0003	411		208	
2,3,7,8-TCDF	0.1	0.809	J	0.306	J
1,2,3,7,8-PECDF	0.03	0.998	J	0.314	U
2,3,4,7,8-PECDF	0.3	2.06	J	0.428	J
1,2,3,4,7,8-HXCDF	0.1	1.89	J	0.529	J
1,2,3,6,7,8-HXCDF	0.1	1.61	J	0.13	U
1,2,3,7,8,9-HXCDF	0.1	2.19	J	0.479	J
2,3,4,6,7,8-HXCDF	0.1	0.547	J	0.267	U
1,2,3,4,6,7,8-HPCDF	0.01	12.3		9.28	
1,2,3,4,7,8,9-HPCDF	0.01	0.986	J	0.399	J
OCDF	0.0003	22.9		27.5	
TEQ 1/2 RL		4.71		1.42	
TEQ 0 RL		4.71		1.36	

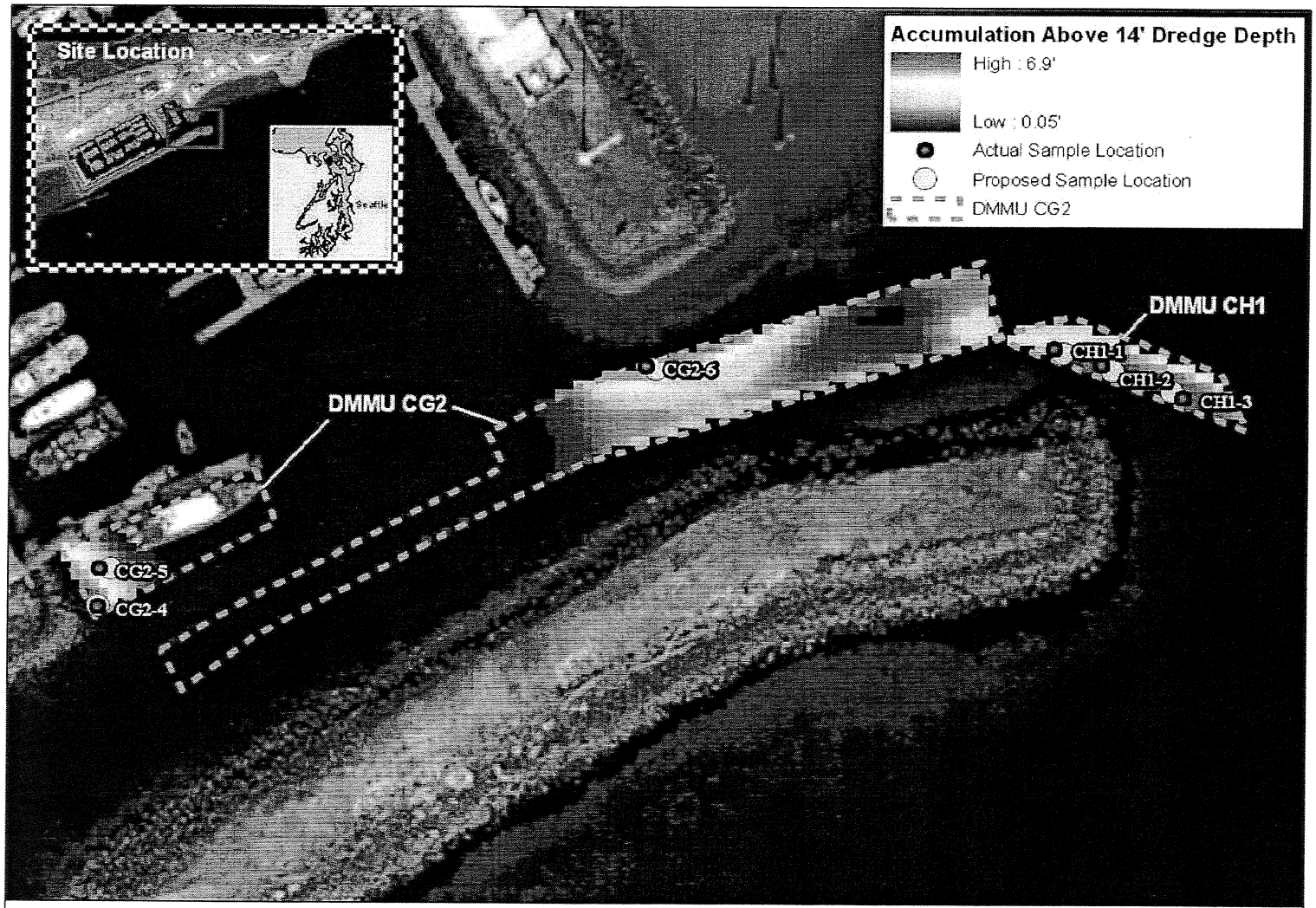

Figure 2–1. DMMU CH1, DMMU CG2, and Individual Sampling Locations for the Channel Reach of the Port Townsend Marina