CENWS-OD-TS **1 August 2002**
Dredged Material Management Office

MEMORANDUM FOR RECORD

SUBJECT: DETERMINATION OF THE SUITABILITY OF DREDGED MATERIAL TESTED UNDER DMMP EVALUATION PROCEDURES FOR DELTA MARINE INDUSTRIES DREDGING PROJECT (2002- 2-00175, DAIS # DELTA-1-B-F-171) WITH PROPOSED DISPOSAL AT THE ELLIOTT BAY OPEN WATER DISPOSAL SITE.

1. Delta Marine Industries proposes to maintenance dredge 7000 cubic yards of material from its facility located on the Duwamish Waterway, Seattle Washington. The following summary reflects the DMMP agencies (Corps of Engineers, Department of Ecology, Department of Natural Resources and the Environmental Protection Agency) consensus decision on the acceptability of the sampling plan and all relevant test data to make a determination of suitability for the disposal of the material at a PSDDA open-water disposal site.

2. The ranking for this area is "high" based on the guidance found in the PSDDA User's Manual (2000) and the PSDDA Management Plan Report, Phase II, Page A-11 (1989).

3. A sampling and analysis plan was completed for this project and approved by the DMMP agencies on 23 April 2001. Sampling for this project was performed on 20 July 2001.
SAP submittal Date

SAP approval date		23 April 2001
Sampling date		20 July 2001
Data Report submittal date	?	December 2001
Recency determination dates		20 July 2003

4. Samples were taken from eight locations and composited for two surface analyses and one subsurface analysis (DMMU 1A, DMMU 2A, and DMMU 1-2B). The sampling and compositing plan is presented in Table 1. In sample area S-1, the sampling device was unable to penetrate the coarse materials and insufficient material was available for analysis.

5. There were no exceedances of 2001 DMMP screening levels for the standard list of chemicals of concern. All samples were analyzed for porewater TBT and no TBT was detected. All detection limits were below screening levels.

6. Due to an error in reporting preliminary chemistry values, bioassays were conducted on DMMU 1A and DMMU 2A, including the amphipod 10-day acute toxicity test,

using *Ampelisca abdita*, the sediment larval test, using *Mytilus galloprovincialis*, and the *Neanthes* 20-day growth test. Tests were conducted according to PSEP (1995), as modified by the DMMP program.

7. Reference sediment for use in the bioassays was collected from Carr Inlet. Amphipod organisms were obtained from Brezina and Associates, and were collected from Tomales Bay CA. Control sediment for the amphipod bioassay was obtained from La Jolla Shore Beach CA. *Mytilus galloprovincialis* organisms were obtained from Carlsbad Aquafarms Carlsbad, CA. *Neanthes* organisms were obtained from Dr. Don Reish, Long Beach California.

8. Bioassay results are listed in Table 2. No hits were observed in the bioassays. The amphipod bioassay failed to meet performance criteria for the control sediment (79 percent survival). All other test parameters were acceptable, and survival, when compared to reference, met the criteria for passing the bioassay.

9. In summary, the DMMP-approved sampling and analysis plan was followed, and quality assurance, quality control guidelines specified by the DMMP were generally followed. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program. Based on the results of the chemical testing, the consensus determination of the DMMP agencies is that 7000 cubic yards of material from the Delta Marine dredging project are suitable for open-water disposal at either a dispersive or nondispersive site.

10. This memorandum documents the suitability of proposed dredged sediments for disposal at a PSDDA open water disposal site or for beneficial use. It 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 and public input, and after an alternatives analysis is done under section 404 (b) 1 of the Clean Water Act.

Delta Marine Industries
Duwamish Waterway

Concur:

23 Sept. 02
Date

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Seattle District Corps of Engineers

10/17/02
Date

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Table 1. Sampling and Compositing Plan

DMMU	Sample Station	Sample Interval
DMMU 1A	S-1	No recovery
	S-2	0 to 3 ft 10 in
	S-3	0 to 3 ft 10 in
	S-4	0 to 4 ft
DMMU2A	S-5	0 to 4 ft
	S-6	0 to 4 ft
	S-7	0 to 4 ft
	S-8	0 to 4 ft
DMMU1-2B	S-4	4 ft to 5 ft 2 in
	S-5	4 ft to 5 ft 8 in
	S-6	4 ft to 5 ft 6 in
	S-7	4 ft to 5 ft 10 in
	S-8	4 ft to 6 ft

Table 2. Summary of chemical and biological testing results

				DMMU ID:	1A		2A		1-2B	
				Rank:	H		H		H	
	Units				Conc.		Conc		Conc	
Total Solids	%				53.7		50.2		66.5	
Total Volatile Solids	%				6.6		7.5		4.4	
Total Organic Carbon	%				2.2		2.2		2.3	
Total Ammonia	mg/kg				7.1		100.0		100.0	
Total Sulfides	mg/kg				2,200		3,400		450	
Gravel	%						0.6		1.4	
Sand	%				22.7		35.2		67.6	
Silt	%				61.9		55.7		25.9	
Clay	%				10.4		12.5		5.1	
Fines (percent silt + clay)	%				72.3		68.2		31.0	
preferred reference match:	%									
Ampelisca abdita hits										
Mytilus galloprovincialis hits:										
Neanthes arenaceodentata hits:										
Bioassay Determination: (P/F)					P		P		P	
BTs exceeded:					no		no		no	
PSDDA Determination:					P		P		P	
DMMU Volume:	cy				2,450		2,450		2,100	
DMMU ID:					1A		2A		1-2B	

Table 3. Solid Phase Bioassay Results Summary

Dredged Material Management Units (DMMU)	Amphipod Mortality, % (*Ampelisca*)	Sediment Larval Test[1] (*Mytilus galloprovincialis*)		20-day *Neanthes* growth, mg-ind-day (% reference), mortality %	DMMU Suitability	
		Mort+Abnor %	Abnormality %		ND	D
Control	21 (QA/QC failure)	26	8.9	initial wgt=0.6 mg-individual **1.00 (± 0.04 SD)** mortality = 0%	NA	
Carr Inlet	10	9	7.2	**0.96 (± 0.13 SD)** mortality = 8%	NA	
DMMU 1-A	76	33	12.3	**0.98 (100%)**[B] mortality = 0%	yes	yes
DMMU 2-A	69	37	6.9	**0.73 (76%)**[B] mortality = 12%	yes	yes
Positive Control (LC50/EC50) **TEST**	$CdCl_2$ (mg/L) 0.89	$CdCl_2$ (mg/L) 11.6	--	$CdCl_2$ (mg/L) 8.83		
DAIS (Mean ± SD)	(0.49 ± 0.42 DAIS)	(10.1 ± 6.5 DAIS for *Mytilus*)		(12.5 ± 5.4 DAIS)		

Legend: ND = Nondispersive site suitability; D = Dispersive site suitability; B = Suitable for either nondispersive or dispersive site disposal. NA = not applicable; NT = not tested; SD = Standard Deviation

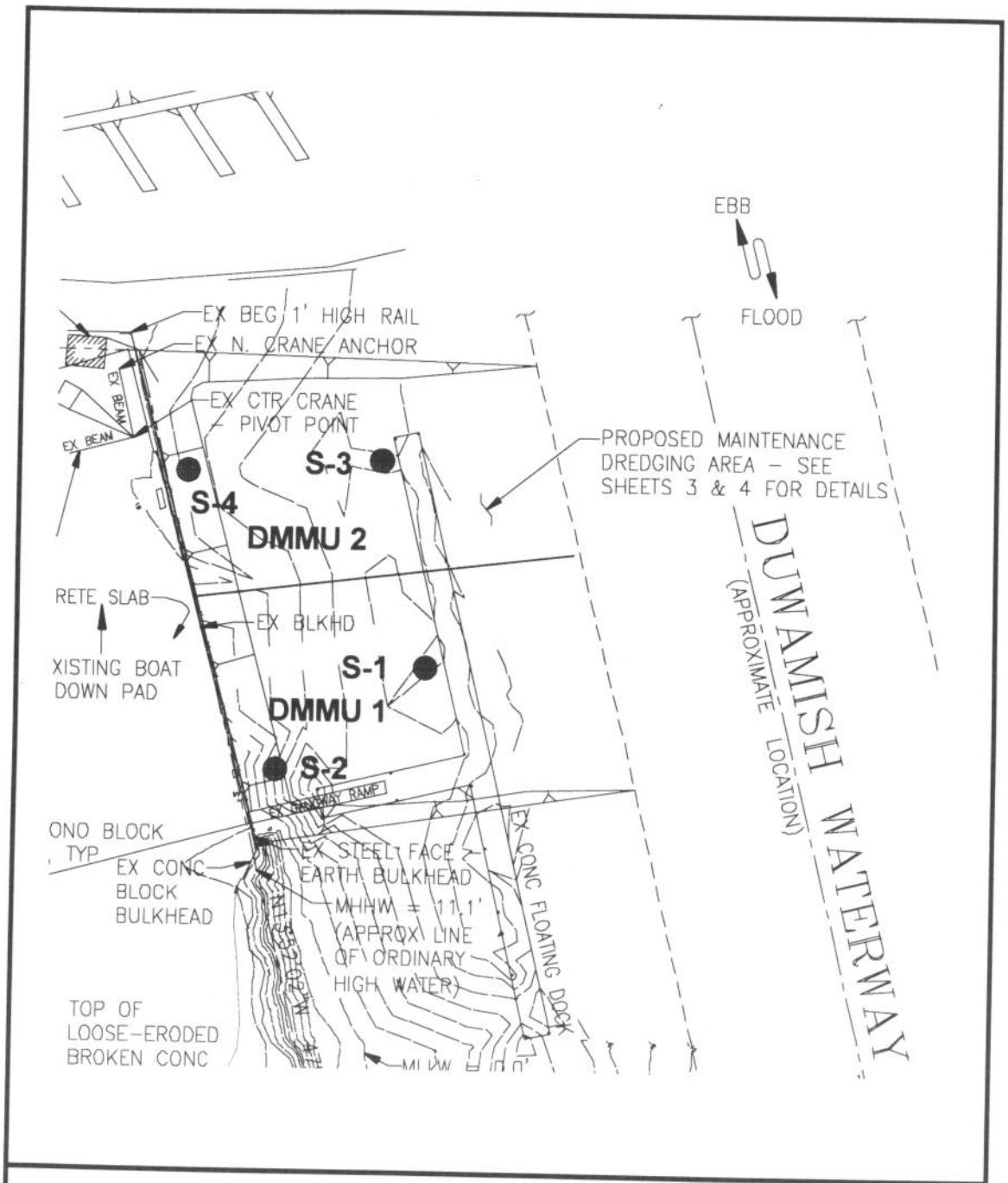

Figure 4
Surface and Subsurface Core Locations and Composite Locations
Delta Marine Industries Site (Duwamish Waterway, Seattle, WA)