

MEMORANDUM FOR RECORD

SUBJECT: DETERMINATION REGARDING THE PARTIAL CHARACTERIZATION OF PROPOSED DREDGED MATERIAL FROM PORT OF EVERETTS PARTIAL CHARACTERIZATION OF THE 10TH STREET BOAT LAUNCH AND SETTLING BASIN REALIGNMENT PROJECT FOR DOWNRANKING UNDER DMMP GUIDELINES

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 partial characterization results and downranking for up to cubic yards of dredged material from the Port of Everett 10th Avenue Boat Launch and the Snohomish River Settling Basin Realignment Project
2. **Background.** The 10th Street Boat Launch and the Lower Snohomish Settling Basin are located in the Snohomish River at Everett Washington. The 10th Street Boat Launch sediments are ranked moderate, and the area has been previously characterized and dredged. The proposed settling Basin Realignment Area is also ranked moderate. The Port is proposing sampling for a down-ranking two level to a low rank. Guidelines for partial characterization and downranking are outlined in the Evaluation Procedures Technical Appendix, Phase 1, in section 5.2.5. (PSDDA 1988)
3. **Project Summary.** Table 1 includes project summary and tracking information.

Table 1. Project Summary

Project ranking	Moderate
Proposed Dredging volume	400,000 cubic yards
Proposed Dredging depth	-10 feet MLLW
SAP Received	30 April 2009
SAP Approved	19 May 2009
Sampling Dates	10 June 2009
Data report received	August 2009
DAIS Tracking Number	POESB-1-A-P-279
USACE Permit Application Number	NA
Recency Determination (Moderate = 5 to 7 Years)	10 June 2014 – 10 June 2016

4. **Project Sampling.** The partial characterization was divided into three areas. Core samples were taken from three locations using the MudMole^R sampler. Surface samples (0-4 feet) were taken in area A and B and subsurface samples (-4 to -8 feet)

were taken in Areas B and C. Samples were not composited and Z-samples were not collected. Sample locations are illustrated in Figure 1. Sample designations are listed in Table 2.

5. Chemical Analysis. Sediments were evaluated for the standard list of DMMP chemicals of concern and for dioxin. Sediment conventional results are listed in Table 3. The material is predominantly sand, with samples ranging from 47 percent sand (S1) to 94 %sand (S3).

There were no exceedances of DMMP screening guidelines. Sediment Chemistry results are listed in Table 4.

Dioxin/furan testing results for all samples are listed in Table 5. Dioxin values ranged from 0.10 pptr TEQ (ND=1/2 detection limit) to 1.87 pptr TEQ (ND-1/2 detection limit). The DMMP agencies are currently using an interim process for interpreting dioxin data, pending development of programmatic final guidelines in late 2009. The interim guidelines provide a project specific comparison of dioxin/furan concentrations in project dredged material to the disposal site background outside the disposal site. The guidelines applicable to the Port Gardner non-dispersive disposal site specify the following:

- Comparison of dioxin in test sediments to disposal site background
- Background is defined using disposal site specific monitoring, which defined an off-site maximum concentration of 5.2 pptr-TEQ and an offsite average concentration of 4.1 pptr-TEQ
- Dioxin concentrations in any given DMMU may not exceed the site maximum
- Average dioxin concentration (weighted to the volume of each DMMU) cannot exceed the mean site concentration

All dioxin/furan concentrations for this project are below both the mean site concentration and the site maximum concentration.

6. Suitability Determination. This memorandum documents the evaluation of the suitability of sediment proposed for downranking in the Port of Everett 10th Street Boat Launch and the Settling Basin Re-alignment. The DMMP agencies agree that the requirements for down-ranking two levels have been met, and the two project locations are now ranked “low.” Both projects will need to undergo full characterization prior to any dredging or disposal of material at a DMMP disposal site.

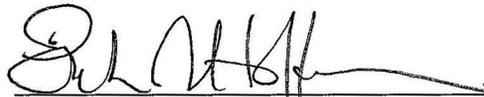
7. Agency Signatures.

Concur:

10/6/09
Date


Stephanie Stirling, Seattle District Corps of Engineers

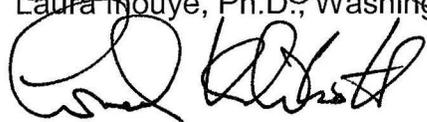
10/6/09
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Erika Hoffman, Environmental Protection Agency

10/06/2009
Date


Laura Inouye, Ph.D., Washington Department of Ecology

10/06/09
Date


Lionel Klikoff, Washington Department of Natural Resources

Copies Furnished:

DMMP Agencies
Rob Gilmour, AMEC

Port of Everett 10th Street Boat Launch and Settling Basin,
Partial Characterization
DMMP Ranking Determination – DY 2010

Table 2. Sample Identification

<i>Station ID</i>	<i>SBC-1</i>	<i>SBC-2</i>	<i>SBC-2</i>	<i>SBC-3</i>
Sample Depth	0-4	0-4	4-8	4-8
Sample ID	S1	S2	S3	S\$

Port of Everett 10th Street Boat Launch and Settling Basin,
 Partial Characterization
 DMMP Ranking Determination – DY 2010

Table 3. Sediment Conventional Data.

		SBC-1	SBC-2	SBC-2	SBC-3
DAIS ID:		S1	S2	S3	S4
GRAIN SIZE	% Gravel:	0.1	0.6	0.5	8.9
	% Sand:	47.2	82.0	94.3	64.7
	% Silt:	42.6	12.9	3.7	21.9
	% Clay:	10.2	4.6	1.5	4.6
	% Fines (clay+silt):	52.8	17.4	5.2	26.5
Total Solids (%):		59.7	65.6	74	80.3
Volatile Solids (%):		6.79	4.81	3.07	1.79
Total Organic Carbon (%):		1.3	2.42	5.76	0.674
Total Sulfides (mg/kg):		1779	306	319	5.24
Total Ammonia (mg N/kg):		30.7	11.6	5.01	33.8

Table 4. Chemical results compared to DMMP regulatory guidelines.

CHEMICAL	SL	BT	ML	S1		S2		S3		S4	
				conc	QL	conc	QL	conc	QL	conc	QL
METALS (mg/kg dry)											
Antimony	150	---	200	8	u	7	u	7	u	6	u
Arsenic	57	507	700	20		16		16		14	
Cadmium	5.1	11.3	14	0.3	u	0.3	u	0.3	u	0.2	u
Chromium	---	267	---	46.2		38.7		32.4		34.3	
Copper	390	1,027	1,300	47.6		35.4		23.5		25.2	
Lead	450	975	1,200	6	j	4		4		2	u
Mercury	0.41	1.5	2.3	0.06		0.04		0.03	u	0.03	
Nickel	140	370	370	41		35		32		30	
Selenium	---	3.0	---	0.3	u	0.3	u	0.3	u	0.2	u
Silver	6.1	6.1	8.4	0.5	u	0.4	u	0.4	u	0.4	u
Zinc	410	2,783	3,800	70		57		50		45	
Organometallic Compounds											
Tributyltin (ug/kg dry)				na							
LPAH (ug/kg dry)											
2-Methylnaphthalene	670	---	1,900	20	u	20	u	19	u	20	u
Acenaphthene	500	---	2,000	20	u	20	u	19	u	20	u
Acenaphthylene	560	---	1,300	20	u	20	u	19	u	20	u
Anthracene	960	---	13,000	20	u	20	u	19	u	20	u
Fluorene	540	---	3,600	20	u	20	u	19	u	20	u
Naphthalene	2,100	---	2,400	20	u	11	j	19	u	20	u
Phenanthrene	1,500	---	21,000	22		18	j	19	u	20	u
Total LPAH	5,200	---	29,000	22		29	j	19	u	20	u
HPAH (ug/kg dry)											
Benzo(a)anthracene	1,300	---	5,100	32		16	j	19	u	20	u
Benzo(a)pyrene	1,600	---	3,600	25		11	j	19	u	20	u
Benzo(g,h,i)perylene	670	---	3,200	14	j	20	u	19	u	20	u
Benzofluoranthenes	3,200	---	9,900	58		12		19	u	20	u
Chrysene	1,400	---	21,000	48		18	j	19	u	20	u
Dibenzo(a,h)anthracene	230	---	1,900	20	u	20	u	19	u	20	u
Fluoranthene	1,700	4,600	30,000	110		40		19	u	20	u
Indeno(1,2,3-c,d)pyrene	600	---	4,400	12	j	20	u	19	u	20	u
Pyrene	2,600	11,980	16,000	78		29		13	j	20	u
Total HPAH	12,000	---	69,000	435	j	162	j	13	j	20	u
CHLORINATED HYDROCARBONS (ug/kg dry)											
1,2,4-Trichlorobenzene	31	---	64	5.4	u	4.6	u	4.4	u	4.1	u
1,2-Dichlorobenzene	35	---	110	1.1	u	0.9	u	0.9	u	0.8	u
1,3-Dichlorobenzene	170	---	---	1.1	u	0.9	u	0.9	u	0.8	u
1,4-Dichlorobenzene	110	---	120	1.1	u	0.9	u	0.9	u	0.8	u
Hexachlorobenzene	22	168	230	20	u	20	u	19	u	20	u
PHTHALATES (ug/kg dry)											
Bis(2-ethylhexyl)phthalate	1,300	---	8,300	24		12	j	19	u	20	u
Butyl benzyl phthalate	63	---	970	20	u	20	u	19	u	20	u
Di-n-butyl phthalate	1,400	---	5,100	20	u	20	u	19	u	20	u
Di-n-octyl phthalate	6,200	---	6,200	20	u	20	u	19	u	20	u
Diethyl phthalate	200	---	1,200	20	u	20	u	19	u	20	u
Dimethyl phthalate	71	---	1,400	20	u	20	u	19	u	20	u

CHEMICAL	SL	BT	ML	S1		S2		S3		S4	
PHENOLS (ug/kg dry)											
2 Methylphenol	63	---	77	20	u	20	u	19	u	20	u
2,4-Dimethylphenol	29	---	210	20	u	20	u	19	u	20	u
4 Methylphenol	670	---	3,600	20	u	20	u	19	u	20	u
Pentachlorophenol	400	504	690	99	u	99	u	97	u	99	u
Phenol	420	---	1,200	49		20	u	19	u	20	u
MISCELLANEOUS EXTRACTABLES (ug/kg dry)											
Benzoic acid	650	---	760	200	u	200	u	190	u	200	u
Benzyl alcohol	57	---	870	20	u	20	u	19	u	20	u
Dibenzofuran	540	---	1,700	20	u	20	u	19	u	20	u
Hexachlorobutadiene	29	---	270	20	u	20	u	19	u	20	u
Hexachloroethane	1,400	---	14,000	20	u	20	u	19	u	20	u
N-Nitrosodiphenylamine	28	---	130	20	u	20	u	19	u	20	u
VOLATILE ORGANICS (ug/kg dry)											
Ethylbenzene	10	---	50	1.1	u	0.9	u	0.9	u	0.8	u
Tetrachloroethene	57	---	210	1.1	u	0.9	u	0.9	u	0.8	u
Total Xylene	40	---	160								
Trichloroethene	160	---	1,600	1.1	u	0.9	u	0.9	u	0.8	u
PESTICIDES AND PCBs (ug/kg dry)											
Aldrin	10	---	---	0.99	u	0.99	u	0.97	u	0.97	u
Chlordane	10	37	---	0.99	u	0.99	u	0.97	u	0.97	u
Dieldrin	10	---	---	2	u	2	u	2	u	1.9	u
Heptachlor	10	---	---	0.99	u	0.99	u	0.97	u	0.97	u
Lindane	10	---	---	0.99	u	0.99	u	0.97	u	0.97	u
Total DDT	6.9	50	69	2	u	2	u	2	u	1.9	u
Total PCBs	130	---	3,100	20	u	20	u	19	u	20	u
Total PCBs (mg/kg OC)	---	38	---								

QL = laboratory qualifier
 u = undetected
 j = estimated value
 OC = organic carbon
 SL = screening level
 BT = bioaccumulation trigger
 ML = maximum level

Table 5. Dioxins/Furans Data and TEQ Calculations

CHEMICAL	TEF	S1		S2			S3			S4		
DIOXINS (ng/kg dry)		conc	QL	conc	QL	TEQ	conc	QL	TEQ	conc	QL	TEQ
2,3,7,8-TCDD	1	0.177	u	0.101	u		0.0472	u		0.0489	u	
1,2,3,7,8-PeCDD	1	0.547		0.141	u	0.5470	0.113		0.1130	0.0489	u	
1,2,3,4,7,8-HxCDD	0.1	0.795		0.221		0.0795	0.23		0.0230	0.0489	u	
1,2,3,6,7,8-HxCDD	0.1	2.12		1.37		0.2120	0.764		0.0764	0.071		0.0071
1,2,3,7,8,9-HxCDD	0.1	3.05		0.78		0.3050	0.963		0.0963	0.147	u	
1,2,3,4,6,7,8-HpCDD	0.01	29.7		12.9		0.2970	9.82		0.0982	1.18		0.0118
OCDD	0.0003	259		108		0.0777	64.8		0.0194	18.5		0.0056
FURANS (ng/kg dry)												
2,3,7,8-TCDF	0.1	0.623		0.317	u	0.0623	0.243		0.0243	0.0489	u	
1,2,3,7,8-PeCDF	0.03	0.079	u	0.0613	u		0.0472	u		0.0489	u	
2,3,4,7,8-PeCDF	0.3	0.299		0.175	u	0.0897	0.12	u		0.0489	u	
1,2,3,4,7,8-HxCDF	0.1	0.37		0.197		0.0370	0.12	u	0.0197	0.0489	u	
1,2,3,6,7,8-HxCDF	0.1	0.26	u	0.15	u		0.079	u		0.0489	u	
1,2,3,7,8,9-HxCDF	0.1	0.0582	u	0.0493	u		0.0472		0.0047	0.0489	u	
2,3,4,6,7,8-HxCDF	0.1	0.28	u	0.172		0.0172	0.08		0.0080	0.0489	u	
1,2,3,4,6,7,8-HpCDF	0.01	3.69		2.1		0.0369	1.08		0.0108	0.0489	u	
1,2,3,4,7,8,9-HpCDF	0.01	0.268		0.137	u	0.0027	0.101	u		0.0489	u	
OCDF	0.0003	8.44		3.82		0.0025	1.86		0.0006	0.06	u	
Total TEQ (ND=1/2 U)		1.87		0.63			0.53			0.10		
Total TEQ (ND=0)			1.7493			0.4567			0.4747			0.0245

U = undetected

QL = laboratory qualifier

TEF = toxicity equivalence factor

TEQ = toxicity equivalents

ng/kg = nanogram/kilogram (parts per trillion)

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