CENWS-OD-TS-DM 4 May 2011 (errata: 7 July 2011)[1]

MEMORANDUM FOR RECORD

SUBJECT: LEVEL-1 DETERMINATION ON THE SUITABILITY OF PROPOSED DREDGED MATERIAL TESTED FOR THE WANAPUM DAM UPPER BOAT LAUNCH IMPROVEMENT PROJECT EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR UPLAND AND IN-WATER BENEFICIAL USE SITES.

The following summary reflects the consensus suitability determination of the Agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington on testing conducted under a Level-1 Dredged Material Assessment for the Wanapum Dam Upper Boat Launch Improvement Project. This project is located on the eastern shoreline of the Columbia River, within Wanapum Lake, north of Wanapum Dam along State route (SR) 243 in Grant County, Washington (**Figure 1**: Vicinity Map; **Figure 2**: Geologic Test Pit Locations; **Figure 3**: Diver collected core sample location). The purpose of the Level 1 Assessment effort is to evaluate the initial sediment quality within the proposed dredging footprint within the boat launch area estimated at <1,000 cy and determine if additional testing is warranted to evaluate potential upland or in-water beneficial reuse.

1. **Table 1** documents the regulatory tracking information and dates for the DMMP testing.

Table 1. Regulatory Tracking Information and Dates

Initial SAP submittal date:	Not Applicable
SAP approval date:	Not Applicable
Sampling date (s): Test pits (stratigraphy: 4 sites): Diver Survey including sediment characterization sample:	May 2010 August 2010
Level-1 Dredged Material Assessment Report submittal:	April 13, 2011
Volume Tested (# DMMU), Sampling Method: (Stainless steel spoon, sediment surface to ~2 feet placed into sampling jar)	<1,000 cy; (1 DMMU); Diver collected sample (1 location)
DAIS Tracking Number:	Not Applicable (Not a DMMP characterization)
Recency Determination Date: **Low** = 7 years	 February 2018 (**Low**)

Level 1 Assessment Background:

1. The project area was evaluated initially through a Level 1 dredged material assessment. The Level 1 Assessment was prepared in general accordance with DMMP guidance (USACE, 2009) and SEF for the Pacific Northwest (RSET, 2009) (See **Table 1**).

[1] Errata correction adds in-water beneficial use alternative.

2. The Level 1 analysis included an evaluation of the stratigraphy of the sediments within the boat launch area at 4 test pit locations (**Figure 2**). The sediments were evaluated in four locations, and consisted of fine to coarse sand and silt, gravel, and cobble. Basaltic bedrock was observed beneath the sand at one of the test pit locations (i.e., TP-2). Samples from three of the four locations were subjected to grain size analysis, and these analyses confirmed that the material was predominately fine to coarse sand (i.e., between 90 and 95 percent) with silt and occasionally gravel (**Table 2**).

3. A diver transect survey of the proposed dredging area was conducted in August 2010. A diver swam a transect that started at the mid-point of the boat launch ramp on the east side of the dredge area to the proposed western limits of the dredge area. The diver also swam a transect perpendicular to the boat launch ramp from the proposed southern limits to the northern limits of the dredge area. The diver observed quarry spalls on the upper portion of the boat ramp in the dredge area and sand across the remaining extent of the dredge area. The diver used a probe to penetrate the sand in the dredge prism and was able to push down to a depth of approximately 2 feet. Upon completion of the dive survey, the diver collected a sample from the approximate center of the dredge area (**Figure 3**). The sample was collected from the surface to approximately 2 feet below the sediment surface with a stainless steel spoon. The sample was analyzed by Analytical Resources, Inc. (ARI) in Tukwila, Washington to provide data to support decisions concerning dredged material management, including upland beneficial reuse. The Level-1 sampling was not coordinated with the DMMP prior to initiating. The DMMP reviewed the testing results provided, and determined that these data were deemed acceptable to support DMMP suitability determination utilizing best-professional-judgment (BPJ).

Table 2. Grain Size Analyses at 3 Test Pit locations and Diver Collected sample location

Grain Size	Test Pit # 2*	Test Pit # 3*	Test Pit # 4*	Dredged Material Sample
Gravel (%)	0.2	0.6	1.5	0.9
Sand (%)	93.8	88.1	93.5	98.2
Fines (%)	6.0	11.3	5.0	0.9

*The 3 Geological test pit samples used a No. 200 sieve (75 µ) to separate fine sand and silt, whereas the DMMP program requires a No. 230 Sieve (63 µ) to separate sand from silt. The Dredged Material sample used the No. 230 sieve.

Chemical Testing Results:

4. The chemical testing results summary for the sample collected within the boat launch dredging footprint is compared to DMMP freshwater guidelines, and carbon normalized marine guidelines is provided in **Table 3.** It demonstrates that for chemicals of concern no detected or undetected chemicals exceeded DMMP freshwater guidelines, or dry-weight marine guidelines, or bioaccumulation triggers.

5. In comparison to carbon normalized marine guidelines, a single undetected chemical 1,4-Dichlorobenzene exceeded SL1 guideline, and three chemicals, 1,2-Dichlorobenzene, 1,2,4-Trichlorobenzene, and Hexachlorobenzene were undetected above the SL2 guidelines.

However, these carbon-normalized marine SL1/SL2 guideline exceedances can be discounted due to extremely low total organic carbon (TOC) of 0.05 %. The general convention when TOC is less than 0.5% is to utilize dry weight guidelines, as normalizing with low TOC may lead to false positive exceedances of guidelines.

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Suitability Determination:

6. In summary, the results of the chemical analyses results after comparison to DMMP guidelines, indicate that all <1,000 cy of proposed dredged material is suitable for upland and in-water beneficial reuse alternatives at approved locations.

7. This memorandum documents the suitability of material proposed for dredging from the Wanapum Dam upper boat launch project in Grant County, Washington, for disposal at an appropriate upland and in-water beneficial reuse disposal site. However, this suitability determination 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 input, and after an alternatives analysis is done under Section 404(b)(1) of the Clean Water Act.

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Concur:

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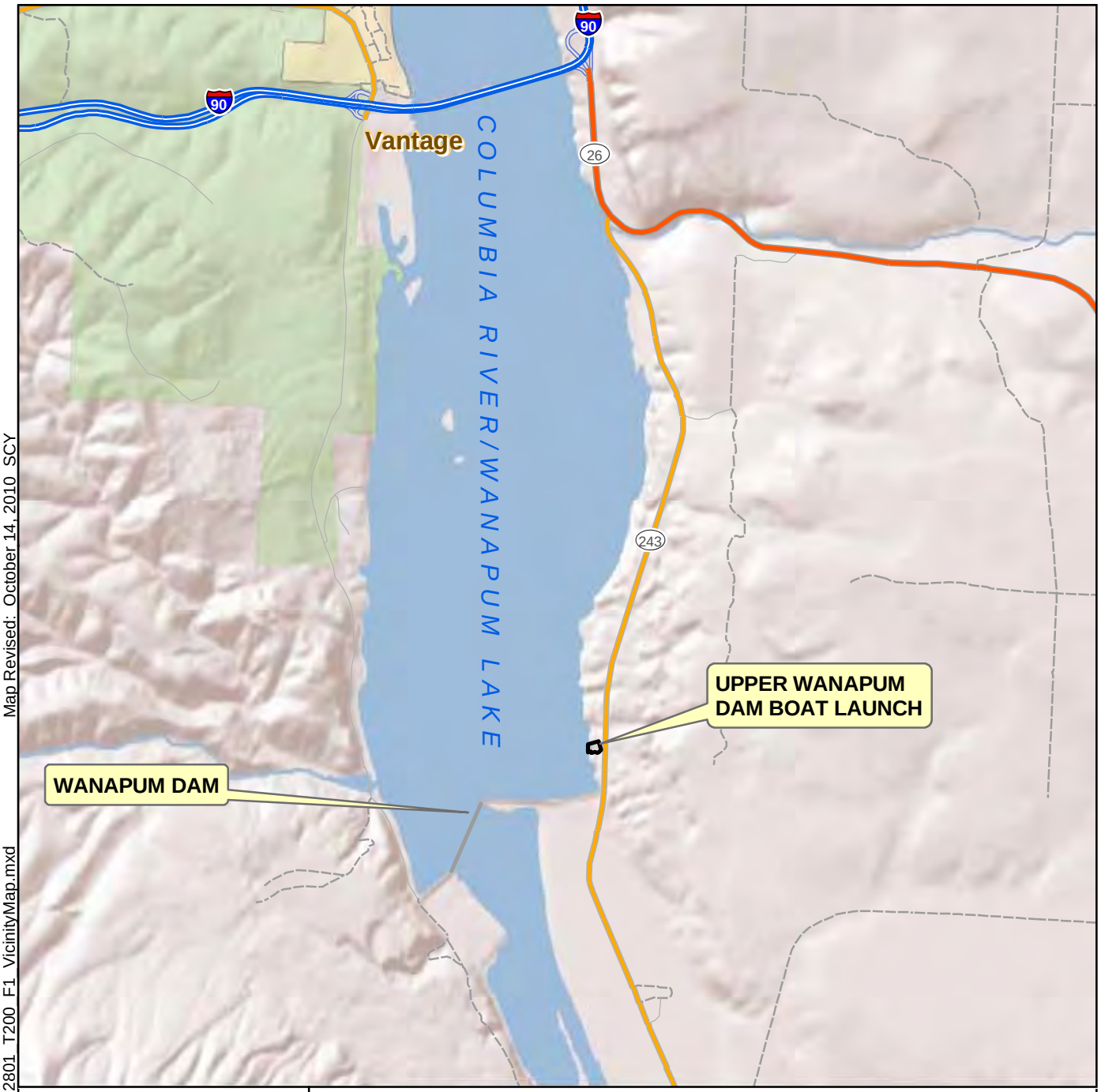

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Feet

Notes:
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Data Sources: ESRI Data & Maps, Street Maps 2008

Transverse Mercator, Zone 11 N North, North American Datum 1983
North arrow oriented to grid north

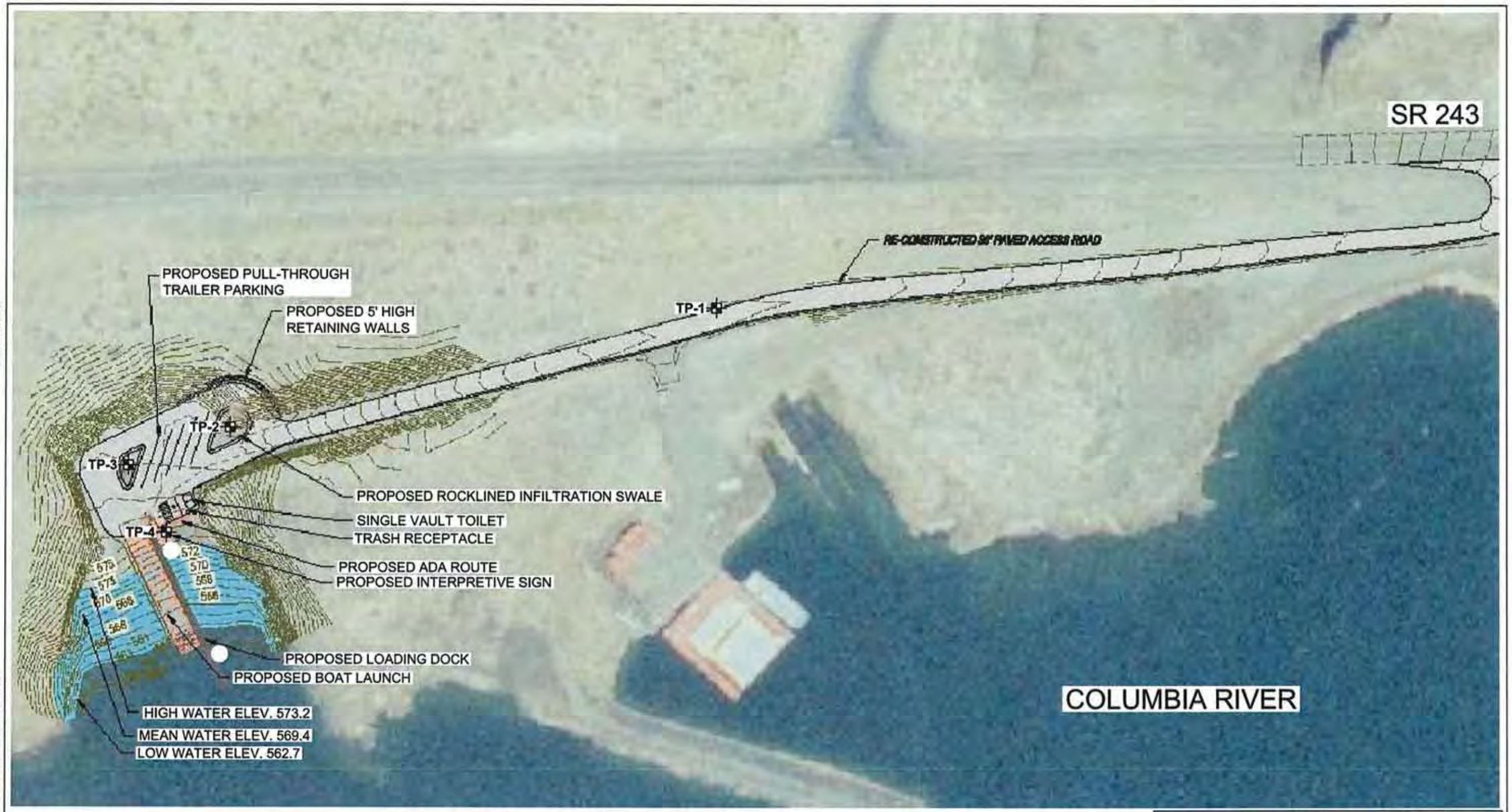
Vicinity Map

Level 1 Dredge Material Assessment
Upper Wanapum Dam Boat Launch
Grant County, Washington

GeoEngineers

Figure 1

Office: TAC Path: \\Tac\projects\2\2164028\GIS\2164028801 T200 F1 VicinityMap.mxd Map Revised: October 14, 2010 SCY



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Notes:
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Reference: Base drawing provided by MacKay & Sposito, Inc., dated 10-09.

Legend

TP-1 Test Pit number and approximate location

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Site Plan

Wanapum Upper Recreational Improvement Project
Grant County, Washington

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Figure 2

UNDEVELOPED PROPERTY

TRASH CANS

PORTABLE TOILET

ORDINARY HIGH WATER ELEV. 575.04'

TWO SIGNS

GRAVEL PARKING AREA

MIN. WATER ELEV. 563.14'

CEMENT CONCRETE BOAT LAUNCH WALL WITH WOOD DECKING

APPROXIMATE SEDIMENT SAMPLE LOCATION

CEMENT CONCRETE BOAT LAUNCH

ASPHALT PAVED ROAD

UNDEVELOPED PROPERTY

WANAPUM LAKE

CEMENT CONCRETE BOAT LAUNCH WALL

AREA TO BE DREDGED

UNDEVELOPED PROPERTY

40 0 40
Feet

Notes:
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Reference: Drawing provided by MacKay & Sposito, Inc., dated 9/21/10.

Site Plan

Level 1 Dredge Material Assessment
Upper Wanapum Dam Boat Launch
Grant County, Washington

GeoEngineers

Figure 3

Table 3. Wanapum Dam Boat Ramp Project: Dredged Material Level-1 Assessment Summary

		Sediment Quality Guidelines						Sample ID:	DMMU-1		
								DMMU ID:	C1		
								Depth (ft BGS)	1-3 ft		
		Interim Freshwater		Marine Guidelines				DMMP			
		Guidelines (dry wgt)				(mg/kg-oc-normalized)			mg/kg-dry wgt	mg/kg-OC	VQ
CHEMICAL NAME	Units	SL1	SL2	SL1 (dw)	SL2 (dw)	SL1 ((oc)	SL2 (oc)	BT (dry wgt)	DMMP	SMS	
Antimony		--	--	150	150				6.0		u
Arsenic	mg/kg	20	51.0	57	93			507.1	6.0		u
Cadmium	mg/kg	1.1	1.5	5.1	6.7			11.3	**0.4**		
Chromium	mg/kg	95	100	260	270			267	**8.4**		
Copper	mg/kg	80	830	390	390			1027	**9.1**		
Lead	mg/kg	340	430	450	530			975	**3.0**		
Mercury	mg/kg	0.28	0.75	0.0	0.59			1.5	0.02		u
Nickel	mg/kg	60	70	--	--			370	**10.0**		
Selenium	mg/kg	--	**--**					3	0.6		u
Silver	mg/kg	2.0	2.5	6.1	6			6.1	0.4		u
Zinc	mg/kg	130	400	410	960			2783	**50.0**		
Tributyltin Ion (bulk sediment)	mg/kg	75	75					73	3.5		u
ORGANIC CHEMICALS											
Total LPAH	ug/kg	6,600	9,200	5,200	5,200	370	780		20.0	4.0	u
Naphthalene	ug/kg	500	1,300	2,100	2,100	99	170		20.0	4.0	u
Acenaphthylene	ug/kg	470	640	560	1,300	66	66		20.0	4.0	u
Acenaphthene	ug/kg	1,100	1,300	500	500	16	57		20.0	4.0	u
Fluorene	ug/kg	1,000	3,000	540	540	23	79		20.0	4.0	u
Phenanthrene	ug/kg	6,100	7,600	1,500	1,500	100	480		20.0	4.0	u
Anthracene	ug/kg	1,200	1,600	960	960.0	220	1200		20.0	4.0	u
2-Methylnapthalene	ug/kg	470	560	670	670	38	64		20.0	4.0	u
Total HPAH	ug/kg	31,000	55,000	12,000	17,000	960	5300		20.0	4.0	u
Fluoranthene	ug/kg	11,000	15,000	1,700	2,500.0	160	1200	4600	20.0	4.0	u
Pyrene	ug/kg	8,800	16,000	2,600	3,300	1000	1400	11980	20.0	4.0	u
Benzo(a)anthracene	ug/kg	4,300	5,800	1,300	1,600	110	270		20.0	4.0	u
Chrysene	ug/kg	5,900	6,400	1,400	2,800	110	460		20.0	4.0	u
Total Benzo(b+k)fluoranthenes	ug/kg	600	4,000	3,200	3,600	230	450		20.0	4.0	u
Benzo(a)pyrene	ug/kg	3,300	4,800	1,600	1,600	99	210		20.0	4.0	u
Indeno(1,2,3-cd)pyrene	ug/kg	4,100	5,300	600	690	34	88		20.0	4.0	u
Dibenzo(a,h)anthracene	ug/kg	800	840	230	230	12	33		20.0	4.0	u
Benzo(g,h,I)perylene	ug/kg	4,000	5,200	670	720	31	78		20.0	4.0	u
1,3-Dichlorobenzene	ug/kg	--	--						20.0		u
1,4-Dichlorobenzene	ug/kg	--	--	110	110.0	3.1	9		20.0	4.0	u
1,2-Dichlorobenzene	ug/kg	--	--	35	50	2.3	2.3		20.0	4.0	u
1,2,4-Trichlorobenzene	ug/kg	--	--	31	51	0.81	1.8		20.0	4.0	u
Hexachlorobenzne (HCB)	ug/kg	--	--	22	70.0	0.38	2.3	168	20.0	4.0	u
Dimethylphthalate	ug/kg	46	440	71	160	53	53		20.0	4.0	u
Diethylphthalate	ug/kg	--	--	200	200	61	110		20.0	4.0	u
Di-n-butylphthalate	ug/kg	--	--	1,400	1,400	220	1700		20.0	4.0	u
Butylbenzylphthalate	ug/kg	260	370	63	900	4.9	64		20.0	4.0	u
Bis(2-ethylhexyl)phthalate	ug/kg	220	320	1,300	1,900	47	78		21.0	4.2	u
Di-n-octylphthalate	ug/kg	26	45	6,200	6,200	58	4500		20.0	4.0	u
Phenol	ug/kg	--	--	420	1,200				**34.0**		
2-Methylphenol	ug/kg	--	--	63	63				20.0		u
4-Methylphenol	ug/kg	--	--	670	670				20.0		u
2,4-Dimethylphenol	ug/kg	--	--	29	29				20.0		u
Pentachlorophenol	ug/kg	--	--	400	690				99.0		u
Benzyl alcohol	ug/kg	--	--	57	73				20.0		u
Benzoic acid	ug/kg	--	--	650	650				200.0		u
Dibenzofuran	ug/kg	400	440	540	540	15	58		20.0	4.0	u
Hexachloroethane	ug/kg	--	--	--	--	**--**	**--**		20.0	4.0	u
Hexachlorobutadiene	ug/kg	--	--	11	120	3.9	6.2		0.99	0.2	u
N-Nitrosodiphenylamine	ug/kg	--	--	28	40	11	11		20.0	4.0	u

Table 3. Wanapum Dam Boat Ramp Project: Dredged Material Level-1 Assessment Summary

		Sediment Quality Guidelines				Sample ID:			DMMU-1		
						DMMU ID:			C1		
						Depth (ft BGS)			1-3 ft		
		Interim Freshwater		Marine Guidelines				DMMP			
		Guidelines (dry wgt)				(mg/kg-oc-normalized)			mg/kg-dry wgt	mg/kg-OC	VQ
CHEMICAL NAME	Units	SL1	SL2	SL1 (dw)	SL2 (dw)	SL1 ((oc)	SL2 (oc)	BT (dry wgt)	DMMP	SMS	
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	ug/kg	--	--	--	--			50	2.0		u
p,p'-DDD	ug/kg	--	--	16	28				2.0		u
p,p'-DDE	ug/kg	--	--	9	9.3				2.0		u
p,p'-DDT	ug/kg	--	--	12	34				2.0		u
Aldrin	ug/kg	--	--	9.5	9.5				0.99		u
Chlordane	ug/kg	--	--	2.8	4.5			37	2.0		u
Dieldrin	ug/kg	--	--	1.9	3.5				0.02		uj
Heptachlor	ug/kg	--	--	1.5	2.0				0.99		u
Alpha-BHC	ug/kg	--	--	--	--						
Gamma-BHC (Lindane)	ug/kg	--	--	--	--				0.99		u
Total PCBs	ug/kg	60	120	130	1,000	12	65	38 (oc)	20.0	4.0	u
Dioxin (TEQ: see Table 5 for detailed results)	**mg/kg**										
Total Solids	ng/kg								**79.1**		
Total Volatile Solids	%										
Total Organic Carbon	%								**0.05**		
Total Ammonia	%										
Total Sulfides	mg/kg										
Gravel	mg/kg								**0.9**		
Sand	%								**98.2**		
Silt	%								**NA**		
Clay	%								**NA**		
Fines (percent silt + clay)	%								**0.9**		
Bioassay Determination: **(P/F)**	%								**NA**		
BTs exceeded:									**No**		
Bioaccumulation conducted:									**No**		
Bioaccumulation Determination: **(P/F)**											
ML Rule exceeded:									**No**		
PSDDA Determination:									**PASS**		
DMMU Volume:									**<1,000**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)									**LM**		
Mean sampling depth (ft)	ft								**2.0**		
Maximum sampling depth (mudline)	ft								**2.0**		
DMMU ID:									**DMMU-C1**		

BGS = Below Ground Surface

P = Pass (BPJ: Suitable for Beneficial Use)

SL1 or SQS = Guideline exceedance (undetected)

SL2 = Guideline exceedance (undetected)

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not applicable

U = undetected at the reporting limit

J = Estimated Concentration (< reporting limit)

Y = Analyte was not detected at or above the concentration identified due to chromatographic interference