CENPP-PL-CH (1105-2-10A) 7 January 1991

MEMORANDUM FOR RECORD

Subject: Tongue Point; DSL Sediment Quality

1. The State of Oregon's portion of the North Tongue Point project was sampled on August 14, 1990 with five stations sampled midway between the ends of piers one through six using a Benthos gravity corer. Samples for physical and chemical analyses were collected from each core and placed in ziplock bags and acid rinsed teflon-lid jars respectively and turned over to Steve Purchase (Oregon, Division of State Lands) for shipment to the appropriate analytical laboratories. Steve Purchase forwarded the results of the chemical analysis by FAX to this office on January 3, 1991 for review and comment.

2. The chemical analyses were preformed by Battelle Pacific Northwest Marine Sciences Laboratory and included chemical analyses for TOC, Oil/grease, heavy metals, pesticides/PCBs and PAHs. A copy of the chemical analyses is attached. Metal concentrations are typical for uncontaminated sediments in the Columbia River. No PCBs were detected as Aroclors. The only pesticides detected were endrin aldehyde (3.6 ppb) in sample DSL #1, A-BHC (3.4 ppb) in sample DSL #3 and D-BHC (6.2 ppb) and Dieldrin (4.1 ppb) in sample DSL #5. These values are near the method detection limits for this analyses. One pesticide, A-BHC, was detected in one of the replicates but not in the other. Dieldrin was also detected in one of the method blanks; thus, the detection near the detection limit is suspect. The detection limits for PAHs were an order of magnitude below the normally requested 50-200 ppb. PAHs were detected in all sediment samples with total PAHs ranging from 155.4 ppb to 591.9 ppb. All concentrations are well below established levels of concern.

3. The chemical results indicate little or no contamination of these sediments with those contaminants present well below established levels of concern. Similar results were obtained during the analyses performed on sediment samples collected at the same time from the Federal portion of the project. The material to be dredged is considered suitable for unconfined in-water disposal. Further information or comment may be obtained by contacting Mark Siipola (503) 326-6463.

Mark D. Siipola
Civil Engineer

Battelle
Pacific Northwest Division
Marine Sciences Laboratory
439 West Sequim Bay Road
Sequim, Washington 98382
(206) 683-4151

December 14, 1990

Mr. Stephen J. Purchase
State of Oregon
Division of State Lands
775 Summer Street, N.E.
Salem, Oregon 98310

Dear Stephen:

The following is a summary of the results of chemical analyses of five Tongue Point sediment samples. Samples were received in August 1990 by Battelle. Samples were subsequently split for the requested chemical analyses, including metals, Total Organic Carbon (TOC), Total Oil and Grease, Total Petroleum Hydrocarbons (TPH), PCBs and Chlorinated Pesticides and Polynuclear Aromatic Hydrocarbons (PAHs). All parameters were analyzed at Twin City Testing in St. Paul, Minnesota. All results are presented on a dry-weight basis. Specific units are defined on the data tables.

ANALYTICAL METHODS

The following methods were used to analyze the sediments described above:

Metals - Sediments were digested according to EPA Method 3020 or 3050 listed in EPA Test Methods for Evaluating Solid Wastes, SW-846. Method 3020 digests were screened for all metals using EPA Method 6010, Inductively Coupled Argon Plasma Spectrometer Method (ICAP). Chromium, copper, nickel and zinc were subsequently quantified using ICAP. Arsenic and antimony were also run using ICAP, but were analyzed using the hydride procedure according to EPA Contract Laboratory Procedure Method 200.62-C-CLP (Special Analytical Services). This procedure was modified by Twin City Testing to work with a Thermo Jarrel Ash ICAP Spectrometer. Method 3050 digests were analyzed for the remaining metals using Graphite Furnace Atomic Absorption Spectrometer (GFAA). Specific EPA methods for these metals include Method 7760 for silver, Method 5131 for cadmium, Method 7421 for lead, and Method 7471 for mercury.

Total Organic Carbon - TOC was determined using a DC-80 Total Carbon Analyzer equipped with a Sludge and Sediment Sampler accessory.

Oil and Grease - Oil and grease were determined according to the protocol outlined in Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March, 1983, Method 413.2. Sediment samples were extracted with freon and subsequent filtered extracts were analyzed using an IBM IR/42 Fourier transform infrared spectrometer.

Total Petroleum Hydrocarbons - TPHs were determined according to the protocol outlined in Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March, 1983, Method 413.2. Sediment samples were extracted with freon. Si gel was added to the filtered extracts and analyzed using an IBM IR/42 Fourier transform infrared spectrometer.

PCBs/Pesticides - Sediment samples were extracted according to EPA Method 3540 using methylene chloride, followed by an alumina and copper clean-up. PCBs and chlorinated pesticides were analyzed using Gas Chromatography/Electron Capture Detection (GC/ECD) according to Method 8080 listed in EPA Test Methods for Evaluating Solid Wastes, SW-846. All positive identifications were confirmed using a second dissimilar column.

PAHs - Sediment samples were extracted according to EPA Method 3540 using methylene chloride. Extracts were analyzed for PAHs using EPA Method 8270 listd in EPA Test Methods for Evaluating Solid Wastes, SW 846. Data were acquired using Gas Chromatography/Mass Spectrometry (GC/MS) in the selected ion recording (SIR) mode.

QUALITY CONTROL

Quality control data includes method blanks, surrogate recoveries, duplicate analyses and matrix spike recoveries. Blanks, duplicates and surrogate recovery data are included on the data tables. Matrix spike data are presented in separate tables.

In general, data quality was acceptable. Holding times for organic extraction were exceeded by seven days due to equipment failure at the laboratory. Samples were frozen during this period and this extension should not effect sample integrity.

Metals - Overall, metals data is acceptable. Silver recovery in the matrix spike was low. This was most likely due to the presence of chloride (saltwater), which causes a negative bias in the determination of silver content by the method used. Antimony recovery was also low and was thought to be caused by matrix interferences in association with hydride formation in the method. These may indicate that the values reported for silver and antimony may be biased low.

TOC - Matrix spike data for TOC analysis was 110% for both the MS and MSD. A replicate analysis of one sample indicated good reproducibility of the analyses.

Oil and Grease and TPH - Quality control data consisted of matrix spikes and method blanks. Matrix spikes were generally acceptable. Spike recoveries for TPH were approximately 50%. Spike recoveries for Oil and Grease were approximately 100%.

PCB/Pesticides - Surrogate recoveries and Matrix Spike recoveries for PCB/Pesticide data were all within control limits. Duplicate analysis of one sample indicated relatively good agreement. One pesticide, A-BHC, was detected in one of the replicates but not in the other; however, this pesticide was detected right at the detection limit.

PAHs - Surrogate recoveries for PAHs were all within control limits. It should be noted, however, that the initial surrogates, added prior to extraction, were found to be at a concentration too high for accurate quantitation by GC/MS in the SIR mode. After speaking with the lab, Battelle recommended adding the lower level surrogates after extraction (but prior to concentration of the extracts). Based on the recoveries of the matrix spikes, these surrogates are found to reflect the quality of the PAH data.

RESULTS

Metals - Metals data in general were not elevated above concentrations expected in the marine environment. Concentrations of all samples were similar.

TOC - TOC concentrations ranged from 1.13 to 2.11 percent of the total dry weight of the sample.

Oil and Grease and TPH - Oil and grease and TPH concentrations were reported on a wet-weight basis. Oil and grease concentrations ranged from 39.8 to 188 mg/Kg. TPH values were generally lower and ranged from 50.5 to 116 mg/Kg. When Oil and grease concentrations exceeded 100 mg/Kg, the TPH values were approximately lower by a factor of 2. When Oil and grease concentrations were low, less than 100 mg/kg, this trend was not observed.

PCB/Pesticides - No PCBs were detected as Aroclors.

Pesticides were detected in three of the five samples. Different pesticides were detected in each sample, including endrin aldehyde, A-BHC, D-BHC and dieldrin. Levels detected were generally near the detection limits of the parameters. Dieldrin was also detected at these levels in one of the method blanks; thus, the detection near the detection limit in one of the samples is questionable.

PAHs - PAHs were detected below 100 ug/kg in all sediment samples. Concentrations generally ranged from approximately 1 to 90 ug/Kg. Concentrations of lower molecular weight hydrocarbons ranged from 0.1 to 43 ug/kg. Higher concentrations were generally observed for the higher molecular weight PAH compounds where concentrations ranged from 10 to 90 mg/kg.

If you have any questions regarding the data presented in this letter or any other issues, please call.

Sincerely,

Eric Crecelius

Eric A. Crecelius
Technical Group Leader
Marine Chemistry

Lisa Lefkovitz
Research Scientist

Enclosures

SEDIMENT DATA 12/13/90
Project: TONGUE POINT
Sponsor: OREGON DEPARTMENT OF STATE LANDS

SEDIMENT METAL DATA

(Concentrations in mg/kg DRY WT.)

SPONSOR Code	LAB Code	% MOISTURE	Ag		As	Cd	Cr	Cu	Hg	
DSL #1	213848	32.60%	0.185	U	3.3	0.84	19.2	10.1	0.047	
DSL #1 rep	213848 rep	45.70%	0.185	U	3.4	0.65	19.2	9.38	0.053	
DSL #2	213852	39.30%	0.23	U	6.6	1	25.8	23.9	0.118	
DSL #3	213855	43.80%	0.206	U	6.1	0.84	29.7	19.8	0.101	
DSL #4	213858	42.60%	0.223	U	6.1	0.75	24.9	23.1	0.091	
DSL #5	213862	48.40%	0.243	U	5.8	0.87	25	19.4	0.062	

STANDARD REFERENCE MATERIAL

MSL--2704		0.15		17	2	72	74	0.21	
Certified value:		NC		23.4 (+/- 0.8)	3.45 (+/- 0.22)	135 (+/- 5)	98.6 (+/- 5)	1.44 (+/- 0.07)	

SPONSOR Code	LAB Code	% MOISTURE	Ni	Pb	Se		Zn	
DSL #1	213848	32.60%	14.2	12	0.15	U	81.4	
DSL #1 rep	213848 rep	45.70%	14.6	11.1	0.15	U	84.4	
DSL #2	213852	39.30%	18.4	8.6	0.22		138	
DSL #3	213855	43.80%	23.1	8.1	0.16	U	122	
DSL #4	213858	42.60%	17.6	13.5	0.18	U	122.8	
DSL #5	213862	48.40%	17.5	15.9	0.19	U	126.1	

STANDARD REFERENCE MATERIAL

MSL--2704		30	110	0.41	320	
Certified value:		44.1 (+/- 3.0)	161 (+/- 17)	3.79 (+/- 0.16)	438 (+/- 12)	

U indicates analyte not detected at detection limit shown.
NA indicates analyte was not analyzed.
NC indicates analyte was not certified.

SEDIMENT DATA 12/13/90
Project: TONGUE POINT
Sponsor: OREGON DEPARTMENT OF STATE LANDS

SEDIMENT PCB DATA

(Concentrations in ug/kg Dry Wt.)

Sponsor Code :	DSL #1	DSL #2	DSL #3	DSL #3 REP	DSL #4	DSL #5	METHOD BLANK	METHOD BLANK
TCT Code :	213848	213852	213855	213855	213858	213862		
Battelle Code:	213-6	213-7	213-8	213-8	213-9	213-10	I	II
PCBS								
AROCLOR 1016	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1221	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1232	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1242	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1248	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1254	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
AROCLOR 1260	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U

SEDIMENT PESTICIDE DATA

Sponsor Code :	DSL #1	DSL #2	DSL #3	DSL #3 REP	DSL #4	DSL #5	METHOD BLANK	METHOD BLANK
TCT Code :	213848	213852	213855	213855	213858	213862		
Battelle Code:	213-6	213-7	213-8	213-8	213-9	213-10	I	II
PESTICIDES							2 U	2 U
ALDRIN	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
A-BHC	3 U	3.7 U	3.6	3.6 U	3.5 U	3.9 U	2 U	2 U
B-BHC	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
D-BHC	3 U	3.7 U	3.3 U	3.6 U	3.5 U	6.2	2 U	2 U
CHLORDANE	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
4,4'DDD	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
4,4'DDE	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
4,4'DDT	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
DIELDRIN	3 U	3.7 U	3.3 U	3.6 U	3.5 U	4.1	2 U	6.2
ENDOSULFAN I	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
ENDOSULFAN II	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
EDOSULFAN SULFATE	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
ENDRIN	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
ENDRIN ALDEHYDE	3.6	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
HEPTACHLOR	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
HEPTACHLOR EPOXIDE	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
LINDANE (G-BHC)	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
TOXAPHENE	29.6 U	36.8 U	33 U	35.6 U	34.8 U	38.8 U	20 U	20 U
METHOXYCHLOR	5.9 U	7.4 U	6.6 U	7.1 U	9 U	7.8 U	4 U	4 U
ENRIN KETONE	3 U	3.7 U	3.3 U	3.6 U	3.5 U	3.9 U	2 U	2 U
SURROGATE RECOVERY (DBC):	53%	84%	99%	110%	120%	110%	120%	**

** Sample inadvertently not spiked with DBC

SEDIMENT DATA 12/13/90
Project: TONGUE POINT
Sponsor: OREGON DEPARTMENT OF STATE LANDS

SEDIMENT PAH DATA

(Concentration in ug/Kg Dry Wt.)

	Sponsor Code :	DSL #1	DSL #2	DSL #3	DSL #4	DSL #5	METHOD BLANK	METHOD BLANK
	TCT Code :	213848	213852	213855	213858	213862		
	Battelle Code:	213-6	213-7	213-8	213-9	213-10	I	II
NAPHTHALENE		3.3	5.3	6.9	3.61 U	9.3	6.4	3.2
ACENAPHTHYLENE		0.1	2.2	2.8	1.1	3.5	0.35 U	0.32 U
ACENAPHTHENE		1.15 U	3.1	3	2.1	5.2	0.89 U	0.8 U
FLUORENE		1.5	5.2	5.6	3.2	7.9	0.71 U	0.64 U
PHENANTHRENE		8.7	26.5	43.9	16.4	32	0.966	0.86 U
ANTHRACENE		1.5	5.6	6.1	2.7	5	0.41 U	0.37 U
FLUORANTHENE		17.8	54.5	80	35.6	65.4	0.59 U	0.53 U
PYRENE		19.8	61.6	90.6	37.2	65.4	0.44 U	0.4 U
BENZ[A]ANTHRACENE		13.8	41.8	35.5	20.8	40.9	0.41 U	0.37 U
CHRYSENE		19.7	62.2	64.7	34.4	64.6	0.35 U	0.32 U
BENZOFLUORANTHENES*		28.6	83.5	84.8	42.4	87.5	0.44 U	0.4 U
BENZO[A]PYRENE		11.9	43.8	42.4	19.8	42.5	0.35 U	0.32 U
INDENO[1,2,3-cd]PYRENE		10	44.7	41.4	23.7	42.3	0.56 U	0.5 U
DIBENZ[a,h]ANTHRACENE		2	7	6.8	3.6	7.6	0.32 U	0.29 U
BENZO[g,h,i]PERYLENE		16.7	71.8	77.4	31.5	65.8	0.28 U	0.25 U
		135.4	519.9	591.9	294.5	544.9		
SURROGATE RECOVERY:								
D10-FLOURENE		108%	115%	109%	103%	108%	132%	127%
D10-ANTHRACENE		77%	78%	88%	76%	76%	79%	77%
D10-PYRENE		66%	69%	76%	65%	62%	72%	73%

* All benzofluoranthene isomers (b,j,and k) are quantified toghether.

SEDIMENT DATA 12/13/90
Project: TONGUE POINT
Sponsor: OREGON DEPARTMENT OF STATE LANDS

TOTAL ORGANIC CARBON

(Concentrations in percent dry wt.)

Sponsor Code :	DSL #1	DSL #2	DSL #3	DSL #4	DSL #4 REP	DSL #5
TCT Code :	213848	213852	213855	213858	213858	213862
Battelle Code:	213-6	213-7	213-8	213-9	213-9	213-10
TOC	1.13%	2.10%	1.33%	1.71%	1.77%	2.11%

SEDIMENT OIL & GREASE AND TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS

(Concentrations in mg/Kg WET Wt.)

Sponsor Code :	DSL #1	DSL #2	DSL #3	DSL #4	DSL #5	DSL #5 REP		
TCT Code :	213848	213852	213855	213858	213862	213862	METHOD BLANK	METHOD BLANK
Battelle Code:	213-6	213-7	213-8	213-9	213-10	213-10	I	II
OIL & GREASE	39.8	169	75	174	188	171	0.5 U	
TPH	50.5	65.6	75.2	99.4	116	102	1.7	
%MOISTURE	32.60%	45.70%	39.30%	43%	48.40%	48.40%		