

25 August 1995

MEMORANDUM FOR CHIEF CENPP-PE-P ATTN CHARLES MASON

Subject: Newport North Marina Jetty Sediment Evaluation

1. Enclosed is the sediment evaluation for the Newport North Marina Jetty project. The sediment was evaluated for acceptability of in-water disposal at the offshore ocean disposal site. The evaluation was conducted according to guidelines published in the "Green Book" and "Inland Testing Manual". These guidelines help insure compliance with requirements of the Marine Protection Research and Sanctuaries Act (MPRSA) and the Clean Water Act (CWA) that pertain to sediment toxicity.
2. The evaluation shows that the proposed dredge material is clean sand, free of contaminants, low in organic content, and located in a high energy area of the river. These characteristics qualify the material to meet the exclusionary criteria of both MPRSA (40 CFR PART 227.13) and CWA (40 CFR, PART 230.60) regulations. By meeting the criteria, the dredge material is acceptable for both in-water and upland disposal. No unacceptable, adverse ecological impacts due to toxicity are expected from such disposal. State 401 water quality certification should be obtainable as well.
3. If you have questions regarding this sediment evaluation please contact Mr. Jim Britton, CENPP-PE-HR, ext. 6471.

Encl
as


STEVEN L. STOCKTON, P.E.
Chief, Planning and Engineering
Division

Newport North Marina Jetty Sediment Evaluation

Abstract

Sediment along the western end of the Newport North Marina Jetty is free of contaminants such as metals, PAHs, pesticides, PCBs, phenols and TBT. According to guidelines developed to implement the CWA and MPRSA, the sediment is acceptable for both in-water and upland disposal.

Introduction

1. The Newport North Marina Jetty is located on the north side of the Yaquina River between river miles 1.5 and 1.8 just opposite the city of Newport. It was constructed to dissipate the energy of incoming waves and offer some protection to boats and moorings facilities located in Newport. Unfortunately, the jetty is under-protecting the area so that modifications are needed to improve its efficiency. Plans call for dredging around the western end of the jetty in conjunction with construction improvements.

2. The Clean Water Act (CWA) and Marine Protection Research and Sanctuaries Act (MPRSA) require that material proposed for dredging be evaluated for the ecological consequences of disposal. This report presents results of physical and chemical analyses of project sediment and evaluates whether any adverse impacts associated with contaminants are expected. Previous studies of local sediment, knowledge of local contaminant sources, and results of the current study are used in the evaluation.

3. Earlier studies in the area show that the sediment near the project is sandy and contains some shell hash (1-5). The area between the jetty and the city of Newport shoreline is progressively more silty proceeding from the jetty to the shore (1). Chemical contaminants increase in concentration along this gradient. However, contaminants are not at levels that restrict in-water disposal. Across the river, at South Beach Marina, similar silty and contaminant conditions prevail (7). Upriver, in the area of the turning basin of the Federal Channel, the sediment is sandy and typically free of contaminants. The condition of river sediments, further upstream in the main channel, is the same and reflects the low exposure to sources of contaminants (3, 6).

4. Sources of local contaminants are surface runoff from developed areas, boat works facilities, marinas, fish processing plants, lumber and wood manufacturing facilities, and non point sources in the watershed.

5. Even though earlier studies suggest that the project is in a high energy area with sandy material free of contaminants, sediment samples were taken at three locations and subjected to physical and chemical analyses to confirm these expectations. A box corer, which is a surface grab sampler, was used instead of a coring device to sample the sediment because previous experience had shown this area to be a zone with a rather "hard bottomed", sandy substrate containing plenty of shell hash. This is descriptive of substrates that typically fall into the exclusion criteria of the CWA and MPRSA. Recent

cores obtained by the Corps show that the sandy layer is roughly 4 to 20 feet deep and is underlain by siltstone (see appendix showing logs of cores obtained for the Corps by Geotechnical Resources, Inc). This indicates that the same high energy conditions have prevailed here for some time. Therefore, it is unlikely that deeper layers contain contaminated material so that core sampling was not necessary.

Methods

6. Three sediment samples were taken on 15 March 1995, using a Gray O'Hare box corer (0.095 m³), at the west end of the North Marina Jetty located in Newport, Oregon (Figure 1). One sample was taken off the end of the jetty while the other two were taken on either side of the jetty in about 15 feet of water. Experience from previous sediment studies has shown that these samples are representative of the whole project area. All sampling, handling and storing of samples was conducted according to approved procedures outlined in the "Green Book" developed jointly by the EPA and Corps of Engineers (8).

7. Subsamples of each were sent to the U. S. Army Corps of Engineers Materials Laboratory at Troutdale, Oregon where they were analyzed for grain size distribution, volatile solids content, resuspended density, void ratio, specific gravity, soil classification and particle roundness grading. The first two parameters are pertinent to this sediment evaluation while the latter five are useful to dredging coordinators and contractors and so will not be discussed in this report.

8. Subsamples of the three samples were also analyzed for chemical contaminants by Columbia Analytical Associates (CAS), Kelso, Washington. Subsamples were tested for heavy metals, pesticides, PCBs, tributyltins (TBT), polynuclear aromatic hydrocarbons (PAHs), phenols, total organic carbon (TOC), and acid volatile sulfides (AVS).

9. Data from the contaminants analyses were reviewed by the Materials Laboratory and this office for quality assurance. Overall, the project data were considered acceptable. The quality assurance report along with the quality control evaluation, conducted by CAS, is included in the appendix with the raw data.

Results/Discussion

10. The sediment samples were mostly sandy material. Mean sand content was 96.1 %. Mean silt was 3.3%. One sample contained a trace of clay. The sample on the north side of the jetty was more silty than the others (Figure 1, Table 1). The mean organic content, reflected in percent volatile solids, was 1.0 %.

11. Heavy metals were below established concern levels (Table 2). AVS was low as well. AVS can be important in fine grained sediment with a high metals content. In that situation AVS would offer some protection against the toxic effects of metals. Since the sediment samples are low in metals the low AVS is of no consequence.

12. TOC content is a measure of organics in the sediment. Sources of organic material are dead plant and animal matter, microbes, living things and organic chemical

contaminants. The measured values indicate the sediment is very low in organic carbon. Organic contaminants were not detected except for two PAHs that were detected at very low concentrations (Table 3). The low TOC content, combined with low organic contaminants, is another indication of the clean nature of this material.

13. These physical and chemical results are typical of high energy areas in river systems where exposure to contaminants from local and upstream sources is limited. In high energy areas the sedimentary material is usually sandy and free of contaminants. Typically, contaminants, if present, would be associated with the fine grained fraction. As can be seen from the physical results the sediment is very low in fine grained material.

Conclusions

14. This sediment evaluation was conducted following procedures outlined in the Draft Inland Testing Manual, developed to implement section 404 of the Clean Water Act and the "Green Book", developed to implement section 103 of the Marine Protection Research and Sanctuaries Act (8,9). These procedures describe methods for conducting ecological evaluations of dredge material to determine the potential for toxicity.

15. The methods utilize a Tiered Testing Procedure to evaluate dredged material for acceptability of disposal. Tier I allows the material to be evaluated based on existing information. Tiers II through IV require further testing of the material. An evaluation only needs to proceed through the Tiers to a point where a decision can be rendered. In this sediment evaluation only Tier I was needed to come to a conclusion regarding acceptability of disposal. Existing information shows the material to meet the exclusionary criteria of both the MPRSA and CWA. The lack of contamination in the sediment lends credence to this conclusion. In terms of impacts related to contaminants, the sediment alongside the western end of the Newport North Marina Jetty is acceptable for in-water disposal at freshwater or ocean disposal sites and at upland disposal sites according to requirements of the MPRSA and CWA. Non adverse ecological impacts are expected from such disposal.

REFERENCES

1. Britton J. U. S. Army Corps of Engineers, Portland District. October 1990. Characterization of Sediments at Yaquina Bay & Harbor. Prepared for U. S. Environmental Protection Agency, Region 10.
2. Britton J. U. S. Army Corps of Engineers, Portland District. 17 July 1990. Yaquina Bay Sediment Evaluation April 1990.
3. Turner, R. 1980 and 1986. Findings of Compliance, Dredged Material Disposal Activities, Yaquina Bay and River Federal Navigation Channel. U.S. Army Corp of Engineers, Portland District.
4. U. S. Army Corps of Engineers, Portland District. 1986. Data on file in the Portland District database. No formal sediment evaluation prepared.
5. U. S. Army Corps of Engineers, Portland District. April 1985. Yaquina Bay Interim Ocean Dredged Material Disposal Site Evaluation Study.
6. Britton J. U. S. Army Corps of Engineers, Portland District. April 1994. Yaquina River sediment evaluation.
7. Siipola, M. U. S. Army Corps of Engineers, Portland District. July 1991. Yaquina Bay South Beach Marina Sediment Evaluation June 1991.
8. U. S. Environmental Protection Agency and U. S. Army Corps of Engineers. February 1991. Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual).
9. U. S. Environmental Protection Agency and U. S. Army Corps of Engineers. May 1993. Evaluation of Dredged Material proposed for Discharge in Inland and Near Coastal Waters - Testing Manual (Draft) (Inland Testing Manual).

Figure 1 Locations of sediment samples taken at the tip of New, North Marina Jetty.

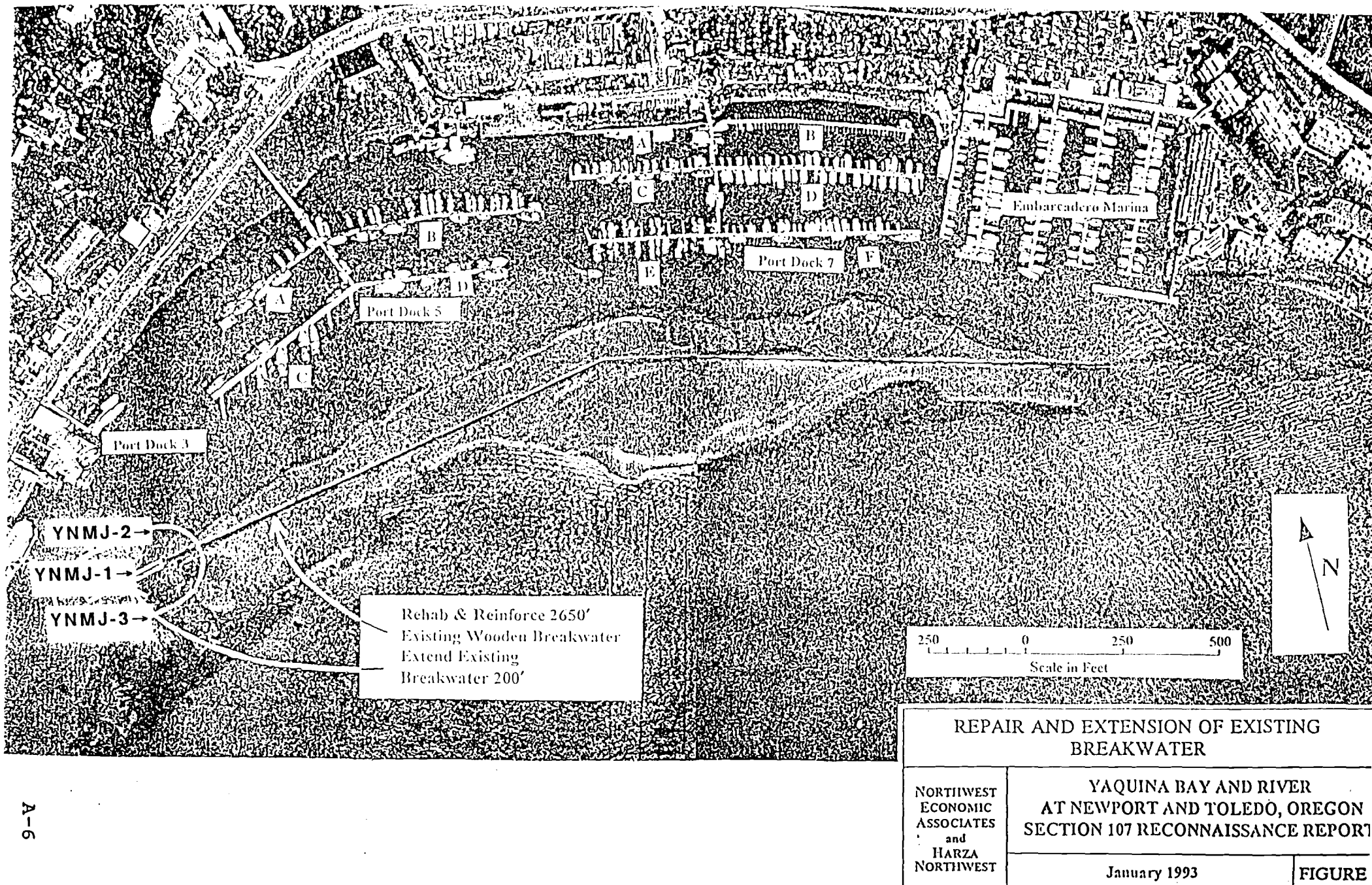


Table 1. Results of physical analyses of Newport North Marina Jetty sediment.

sample	median grain size mm	sand	silt	clay	volatile solids
			%		
YNMJ-1	0.18	98.6	1.4	0.0	0.8
YNMJ-2	0.16	90.6	7.6	1.8	1.5
YNMJ-3	0.18	99.1	0.9	0.0	0.8
mean	0.17	96.1	3.3	0.6	1.0

Table 2. Concentrations of metals, AVS and TOC in sediment near the west end of Newport Marina Jet

sample	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	AVS	TOC (%)
	(ppm)									
YNMJ-1,3	2.8	0.34	11.5	2.20	1.78	<0.02	7.3	13.9	19	0.73
YNMJ-2	4.5	0.15	20.7	7.57	3.58	<0.02	16.0	29.8	110	1.07
mean	3.7	0.25	16.1	4.89	2.68	0.00	11.7	21.9	65	0.90
SL*	57	0.96	180	81	66	0.21	140	160	NA	NA

* EPA, Region 10 screening level for marine waters.

Table 3. Concentrations of organics in Newport North Marina Jetty sediment.

samples	pesticides*	PCBs*	fluoranthene^	phenol^	TBT*
ppb					
YNMJ-1,3	ND	ND	ND	ND	ND
YNMJ-2	ND	ND	21	33	ND
SL#	6.9-10	130	630	120	30

* Pesticide method reporting limits (MRLs) ranged from 2-30 ppb, PCBs ranged from 1-30 ppb, and the TBT MRL was 3.0 ppb.

^ Of 18 PAHs only fluoranthene was detected and of 14 phenols only phenol. The detection limits for PAH was 20 ppb and for phenols, 20 or 50 ppb.

EPA Region 10 screening level for marine waters.



DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION LABORATORY
CORPS OF ENGINEERS
1491 N.W. GRAHAM AVENUE
TROUTDALE, OREGON 97060-9503

CENPD-ET-PL (1110-1-8100c)

March 28, 1995

MEMORANDUM FOR: Commander, Portland District ATTN:CENPP-PE-HR (Britton)

SUBJECT: W.O. #95-191, Report of Sediment Analysis

Project: Newport North Marine Jetty
Location: Newport, Oregon
Submitted by: CENPP-PE-HR (Britton)
Date Sampled: -- Date Received: 16 March 95
Method of Test or Specification: EMM1110-2-1906, ASTM
Reference: a) DD Form 448, MIPR no. E86-95-0068 dated 13 March 95
b) NPD Form 303, Transmittal of Sedimentation Samples, dated
16 March 95 outlining required tests.

1. Enclosed is report of mechanical analysis for 3 sediment samples submitted from the above project. Included are:

- a) Enclosure 1, Summary of Dredge Test Analysis.
- b) Enclosures 2 through 4, Report of Particle Size Analysis and Classification Tests, one for each sample submitted.

2. This completes all physical analysis requested to date for this project.

Enclosures

JAMES K. HINDS, PE
Deputy Director

Copy Furnished: CENPD-ET-P

CENPD-ET-P-L (1110-1-8100c)
SUBJECT: W.O. 95-191, Results of Chemical Analysis

4. This completes all work requested for this project.

Enclosures

Approved
For TIMOTHY J. SEEMAN
Director

Copy Furnished: CENPD-ET-P
CEMRD-ED-EC
CEMP-RT

NEWPORT NORTH MARINE JETTY
Newport, Oregon**Results of Dredge Test Analysis**

<u>CENPD Sample No.</u>	<u>Resuspended Density, gm/L</u>	<u>Void Ratio</u>	<u>Volatile Solids, %</u>	<u>Specific Gravity</u>	<u>Soil Classification ASTM D2487</u>	<u>Particle Roundness Grading</u>
YNMJ-1	1833	1.009	0.8	2.673	SP	Subangular-subrounded
YNMJ-2	1676	1.450	1.5	2.656	SP-SM	Subangular-subrounded
YNMJ-3	1871	0.938	0.8	2.689	SP	Subangular-subrounded

NEWPORT NORTH MARINE JETTY 95-91

Boring: Sample: YNMJ-1 Depth: -- Lab No.: 9101

----- Sieve Analysis -----

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	612.00	0.0
No. 18	0.07	100.0
No. 35	0.30	99.8
No. 60	11.79	91.6
No. 120	131.89	6.1
No. 230	138.44	1.4
Pan	140.42	0.0

No hydrometer analysis.

D85: 0.24 D60: 0.19 D50: 0.18 D30: 0.15 D15: 0.13 D10: 0.13 mm
Cu: 1.50 Cc: 0.92

Liquid Limit: NP Plasticity Index: NP
Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 97.4% Fines: 2.6%

----- ASTM D 2487 Classification -----

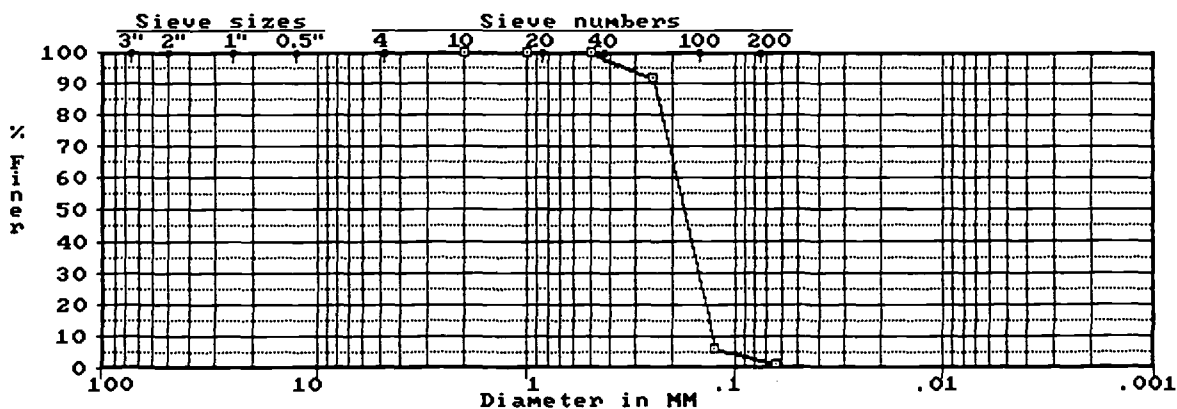
SP Poorly graded SAND

----- TM 5-818-2 Frost Classification -----

Frost Classification: NFS

----- Comments -----

-DATE SAMPLED: 15 MARCH 1995
-VOLATILE SOIDS: 0.8%



5/6
sand 98.6
silt 1.4
clay -

NEWPORT NORTH MARINE JETTY 95-91

Boring: Sample: YNMJ-2 Depth: -- Lab No.: 9102

Sieve Analysis			Hydrometer Analysis				
Cumulative			Sample Weight: 92.20 gr. Start Time: 0000				
Sieve	Grams Retained	Percent Passing	Time	Temp (C)	Hydrometer Reading	Diameter in mm	Percent Finer
5 In.	0.00	100.0	1	20.0	7.1	0.0521	8.2
2.5 In.	0.00	100.0	3	20.0	5.6	0.0303	6.5
1.25 In.	0.00	100.0	10	20.0	4.1	0.0167	4.9
5/8 In.	0.00	100.0	100	20.0	2.1	0.0069	2.8
5/16 In.	0.00	100.0	200	20.0	1.2	0.0049	1.8
No. 5	0.00	100.0					
No. 10	0.00	100.0					
Pan	406.22	0.0					
No. 18	0.05	99.9					
No. 35	0.17	99.8					
No. 60	4.40	95.2					
No. 120	74.82	18.9					
No. 230	83.53	9.4					
Pan	92.20	0.0					

D85: 0.23 D60: 0.18 D50: 0.17 D30: 0.14 D15: .094 D10: .066 mm
Cu: 2.75 Cc: 1.60

Liquid Limit: NP Plasticity Index: NP
Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 88.2% Fines: 11.8%

ASTM D 2487 Classification

SP-SM Poorly graded SAND with silt

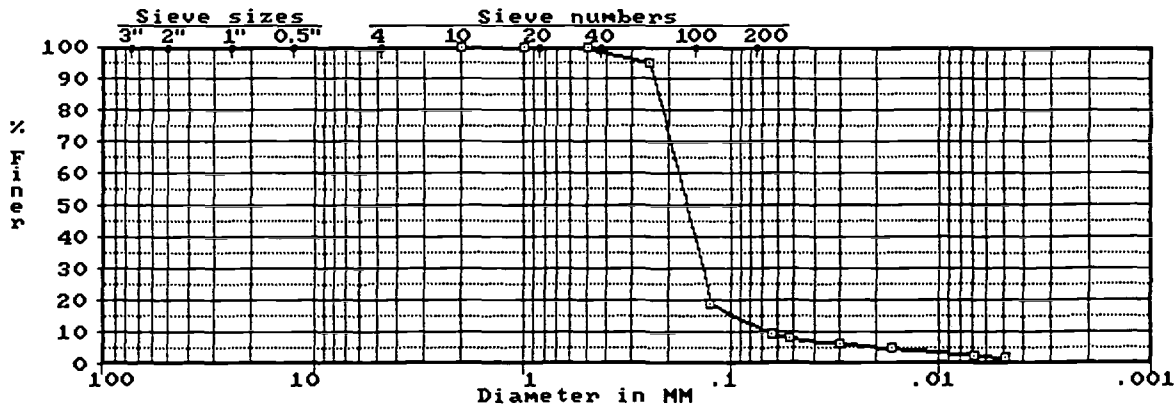
TM 5-818-2 Frost Classification

Percent finer than 0.02 mm: 5.4 Frost Classification: S2

Comments

-DATE SAMPLED: 15 MARCH 1995

-VOLATILE SOIDS: 1.5%



7.6
sand 90.6
silt 7.6
clay 1.8

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * *
NEWPORT NORTH MARINE JETTY 95-91

Boring: Sample: YNMJ-3 Depth: -- Lab No.: 9103

----- Sieve Analysis -----

Sieve	Cumulative Grams Retained	Percent Passing
5 In.	0.00	100.0
2.5 In.	0.00	100.0
1.25 In.	0.00	100.0
5/8 In.	0.00	100.0
5/16 In.	0.00	100.0
No. 5	0.00	100.0
No. 10	0.00	100.0
Pan	893.74	0.0
No. 18	0.02	100.0
No. 35	0.17	99.8
No. 60	4.72	95.2
No. 120	91.96	5.8
No. 230	96.69	0.9
Pan	97.61	0.0

No hydrometer analysis.

D85: 0.23 D60: 0.19 D50: 0.18 D30: 0.15 D15: 0.13 D10: 0.13 mm
Cu: 1.47 Cc: 0.93

Liquid Limit: NP Plasticity Index: NP
Fines Type Used for Classification: ML, SILT

Gravel: 0.0% Sand: 97.9% Fines: 2.1%

----- ASTM D 2487 Classification -----

SP Poorly graded SAND

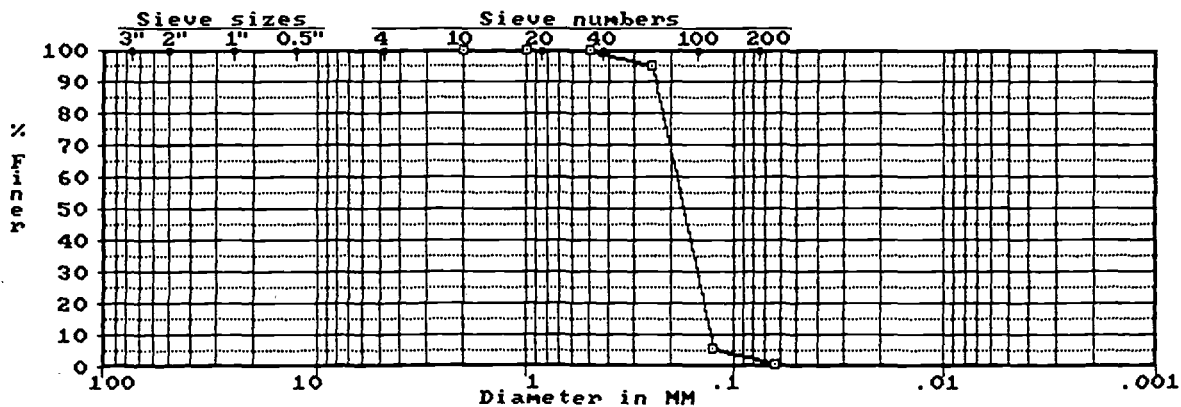
----- TM 5-818-2 Frost Classification -----

Frost Classification: NFS

----- Comments -----

-DATE SAMPLED: 15 MARCH 1995

-VOLATILE SOIDS: 0.8%



76
 Sand 99.1
 silt 0.9
 clay -



DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION LABORATORY
CORPS OF ENGINEERS
1491 N.W. GRAHAM AVENUE
TROUTDALE, OREGON 97060-9503

CENPD-ET-P-L (1110-1-8100c)

27 Apr 95

MEMORANDUM FOR: Commander, Portland District, ATTN: CENPP-PE-HR (Britton)

SUBJECT: W.O. 95-191, Results of Chemical Analysis

Project: Newport North Marina Jetty Sediment/Project
Intended Use: Site Evaluation
Source of Material: Reference Chain of Custody Records
Submitted By: CENPP-PE-HR (Britton)
Date Sampled: 15 Mar 95 Date Received: 22 Mar 95
Reference: a) DD Form 448 MIPR No. E86-95-0066 dated 13 Mar 95
b) Original report number K9501715 from Columbia Analytical Services,
Inc. submitted to your office by the laboratory

1. Enclosed are the original Quality Assurance Report, original report number K9501715 from Columbia Analytical Services (CAS) Inc., and original CENPD-ET-P-L sample cooler receipt form, and original chain of custody record for the samples collected from Newport North Marina Jetty Sediment site.

2. **EVALUATION OF THE PROJECT LABORATORY'S' RESULTS:** All laboratory method blanks were free of targeted analytes. All holding times, detection limits met method requirements. Chain of custody record and sample cooler receipt form met Corps of Engineers ER 1110-1-263 protocols except the sample cooler temperature was 7.6 °C which is above COE required limits of 4±2 °C. All surrogate, matrix spike (MS), matrix spike duplicate (MSD), laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries and relative percent differences (RPD) results were within EPA, Laboratory Established (LE). Quality Control (QC) limits, with the following exceptions; mercury MS recovery was within CAS LE QC limits of [60-130] but above EPA QC limits of [75-125], since no mercury was detected in any sample the high recovery did not affect the results, cadmium duplicate RPD result was above EPA limit, the cadmium data are considered estimates, lead RPD result was not calculable due to the detection at or near the detection limit, which is not considered significant. Overall the project data are acceptable.

3. If you have any questions or comments regarding the Chemical Quality Assurance Report, please contact Dr. Ajmal M. Ilias at (503) 669-0246.

HTRW COOLER RECEIPT FORM

Project: Yaguin Bay W.O.# 95-186
Newport N. Marina Jetty 95-191
 Cooler received on 3/16/95 and opened on 3/16/95 by [Signature]
 (signature)

1. Was cooler scanned for presence of radioactivity, and noted if found? YES NO
2. Were custody seals on outside of cooler and intact? YES ☒ NO Hand-Delivered
 - a. If YES, how many and where: N/A
 - b. Were signature and date correct? YES NO N/A
3. Were custody papers taped to the lid inside the cooler? YES ☒ NO Hand-Delivered
4. Were custody papers properly filled out (ink, signed, dated, etc.)? ☒ YES NO
5. Did you sign custody papers in the appropriate place? ☒ YES NO
6. Did you attach shipper's packing slip to this form? YES ☒ NO N/A
7. What kind of packing material was used? ice bags
8. Temperature of cooler 4 °C

Approved by PDH Date 3/16/95

9. Were all bottles sealed in separate plastic bags? ☒ YES NO
10. Did all bottles arrive in good condition (unbroken)? ☒ YES NO
11. Were all bottle labels complete (ID. No., dated, Anal. method, etc.) YES ☒ NO 1
12. Did all bottle labels agree with custody papers? ☒ YES NO
13. Were correct bottles used for the tests indicated? YES NO 2
14. If present, were VOA vials/containers checked for absence of air bubbles/
head space and noted if found? YES NO N/A
15. Was sufficient volume of sample sent in each bottle? ☒ YES NO
16. Were correct preservatives used? ☒ YES NO

Approved by: PDH Date 3/16/95

If not approved:

- a. Name of person contacted _____ Date _____
- b. Corrective action taken; if necessary: Samples Held until MPR Received.
 (see attached)

Additional Comments: 1) Analytical Methods not listed on labels.
2) 1 sixteen ounce jar submitted/sample for a large
number of analyses.

HTRW COOLER RECEIPT FORM

Project: Yaguinz Bay W.O.# 95-186
Newport N. Marina Jetty W.O.# 95-191
 Cooler received on 3/16/95 and opened on 3/16/95 by _____

(signature)

1. Was cooler scanned for presence of radioactivity, and noted if found? YES NO
2. Were custody seals on outside of cooler and intact? YES NO *Hand-Delivered*
 - a. If YES, how many and where: N/A
 - b. Were signature and date correct? YES NO N/A
3. Were custody papers taped to the lid inside the cooler? YES NO *Hand-Delivered*
4. Were custody papers properly filled out (ink, signed, dated, etc.)? YES NO
5. Did you sign custody papers in the appropriate place? YES NO
6. Did you attach shipper's packing slip to this form? YES NO N/A
7. What kind of packing material was used? ice bags
8. Temperature of cooler 4 °C

Approved by PDH Date 3/16/95

9. Were all bottles sealed in separate plastic bags? YES NO
10. Did all bottles arrive in good condition (unbroken)? YES NO
11. Were all bottle labels complete (ID. No., dated, Anal. method, etc.) YES NO 1
12. Did all bottle labels agree with custody papers? YES NO
13. Were correct bottles used for the tests indicated? YES NO 2
14. If present, were VOA vials/containers checked for absence of air bubbles/
head space and noted if found? YES NO N/A
15. Was sufficient volume of sample sent in each bottle? YES NO
16. Were correct preservatives used? YES NO

Approved by: PDH Date 3/16/95

If not approved:

- a. Name of person contacted _____ Date _____
- b. Corrective action taken; if necessary: Samples Held until MPR Received.
(see attached)

Additional Comments: 1) Analytical Methods not listed on labels.
2) 1 sixteen ounce jar submitted/sample for a large
number of analyses.

**Columbia
Analytical
Services^{INC.}**

April 21, 1995

Service Request No.: K9501715

Director
U. S. Army Corps of Engineers
CENPD Materials Laboratory
1491 NW Graham Avenue
Troutdale, OR 97060-9503

Re: Newport North Marina Jetty Sediment/Project #95-0191

Dear Director:

Enclosed are the results of the sample(s) submitted to our laboratory on March 22, 1995. For your reference, these analyses have been assigned our service request number K9501715.

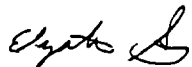
The Electronic Data Deliverable (EDD) will follow shortly.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 281.

Respectfully submitted,

Columbia Analytical Services, Inc.



Elizabeth Schneider
Project Chemist

ES/sam

RECEIVED
APR 21 1995

Page 1 of 31

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

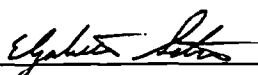
Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: NA
Date Analyzed: 3/29/95

Sulfide, Acid Volatile
EPA Method Draft Dec '91
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
YNMJ-1,3 Composite	K9501715-003	0.5	19
YNMJ-2	K9501715-004	0.5	110
Method Blank	K9501715-MB	0.5	ND

Approved By:



Date:

4/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

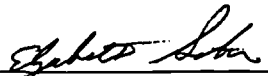
Analytical Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: NA
Date Analyzed: 4/7/95

Total Organic Carbon (TOC)
ASTM Method D4129-82 Modified
Units: Percent (%)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
YNMJ-1,3 Composite	K9501715-003	0.05	0.73
YNMJ-2	K9501715-004	0.05	1.07
Method Blank	K9501715-MB	0.05	ND

Approved By:  Date: 4/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

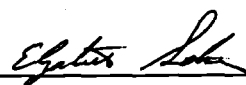
Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/30/95

Total Metals
Units: mg/Kg (ppm)
Dry Weight Basis

	YNMJ-1,3	YNMJ-2	Method Blank
Sample Name:	Composite		
Lab Code:	K9501715-003	K9501715-004	K9501715-MB
Date Analyzed:	4/4/95	4/4/95	4/4/95

Analyte	EPA Method	MRL			
Arsenic	200.8	0.5	2.8	4.5	ND
Cadmium	200.8	0.02	0.34	0.15	ND
Chromium	200.8	0.2	11.5	20.7	ND
Copper	200.8	0.05	2.20	7.57	ND
Lead	200.8	0.02	1.78	3.58	ND
Mercury	7471	0.02	ND	ND	ND
Nickel	200.8	0.2	7.3	16.0	ND
Zinc	200.8	0.5	13.9	29.8	ND

Solids, Total (%)	160.3 M	-	76.7	74.5	-
M	Modified				

Approved By: 

Date: 4/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: U.S. Army Corps of Engineers
 Project: Newport North Marina Jetty Sediment/#95-0191
 Sample Matrix: Soil

Service Request: K9501715
 Date Collected: 3/15/95
 Date Received: 3/22/95
 Date Extracted: 3/29/95

Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) - Low Level

EPA Methods 3550/8080

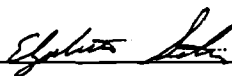
Units: mg/Kg (ppm)

Dry Weight Basis

Analyte	MRL	YNMJ-1,3	YNMJ-2	Method Blank
		Sample Name:	Composite	
		Lab Code:	K9501715-003	K9501715-004
		Date Analyzed:	4/7/95	4/7/95
Alpha-BHC	0.002	ND	ND	ND
Beta-BHC	0.005	ND	ND	ND
Delta-BHC	0.002	ND	<0.006(a)	ND
Heptachlor	0.002	ND	ND	ND
Aldrin	0.002	ND	ND	ND
Heptachlor Epoxide	0.002	ND	ND	ND
Gamma-BHC (Lindane)	0.002	ND	ND	ND
Endosulfan I	0.002	ND	ND	ND
Endrin	0.002	ND	ND	ND
Endosulfan II	0.002	ND	ND	ND
4,4'-DDD	0.002	ND	ND	ND
Endrin Aldehyde	0.002	ND	ND	ND
Endosulfan Sulfate	0.002	ND	ND	ND
4,4'-DDT	0.002	ND	ND	ND
4,4'-DDE	0.002	ND	ND	ND
Dieldrin	0.002	ND	ND	ND
Methoxychlor	0.004	ND	ND	ND
Toxaphene	0.03	ND	<0.1(a)	ND
Chlordane	0.01	ND	ND	ND
PCBs: Aroclor 1016	0.01	ND	ND	ND
Aroclor 1221	0.01	ND	<0.03(a)	ND
Aroclor 1232	0.01	ND	<0.03(a)	ND
Aroclor 1242	0.01	ND	ND	ND
Aroclor 1248	0.01	ND	ND	ND
Aroclor 1254	0.01	ND	ND	ND
Aroclor 1260	0.01	ND	ND	ND

a

The MRL is elevated because of matrix interferences.

Approved By: 

Date: 4/21/95

3S30/111094

K9501715.XLS - 3S30 4/21/95

Page No.:

000006

Analytical Report

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/28/95

Butyltins*
Units: µg/Kg (ppb)
Dry Weight Basis

Analyte:	Tributyltin	Dibutyltin	Butyltin
Method Reporting Limit:	3	3	3

Sample Name	Lab Code	Date Analyzed			
YNMJ-1,3 Composite	K9501715-003	4/7/95	ND	ND	ND
YNMJ-2	K9501715-004	4/7/95	ND	ND	ND
Method Blank	K950328-SB1	4/7/95	ND	ND	ND

Methodology based on C.A.Krone, et al., "A Method for Analysis of Butyltin Species and Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound," National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Seattle, WA, November 1988.

Approved By: 100 Date: 4/10/25

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/27/95

Phthalate Esters and Polynuclear Aromatic Hydrocarbons
EPA Method 3550 in combination with GC/MS SIM Method
Units: µg/Kg (ppb)
Dry Weight Basis

	YNMJ-1,3	YNMJ-2	Method Blank
Sample Name:	Composite		
Lab Code:	K9501715-003	K9501715-004	K950327-SB1
Date Analyzed:	3/30/95	3/30/95	3/30/95

Analyte	MRL			
Naphthalene	20	ND	ND	ND
2-Methylnaphthalene	20	ND	ND	ND
Acenaphthylene	20	ND	ND	ND
Dibenzofuran	20	ND	ND	ND
Acenaphthene	20	ND	ND	ND
Fluorene	20	ND	ND	ND
Phenanthrene	20	ND	ND	ND
Anthracene	20	ND	ND	ND
Fluoranthene	20	ND	21	ND
Pyrene	20	ND	ND	ND
Benz(a)anthracene	20	ND	ND	ND
Chrysene	20	ND	ND	ND
Benzo(b)fluoranthene	20	ND	ND	ND
Benzo(k)fluoranthene	20	ND	ND	ND
Benzo(a)pyrene	20	ND	ND	ND
Indeno(1,2,3-cd)pyrene	20	ND	ND	ND
Dibenz(a,h)anthracene	20	ND	ND	ND
Benzo(g,h,i)perylene	20	ND	ND	ND

Approved By: Elyse SelvaDate: 4/14/95

3S30/120594

K9501715.XLS - PAH-Phth 4/14/95

Page No.:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/27/95

Phenols

EPA Method 3550 in combination with GC/MS SIM Method

Units: $\mu\text{g/Kg}$ (ppb)

Dry Weight Basis

	YNMJ-1,3	YNMJ-2	Method Blank
Sample Name:	Composite		
Lab Code:	K9501715-003	K9501715-004	K950327-SB1
Date Analyzed:	4/3/95	4/3/95	4/3/95

Analyte	MRL	YNMJ-1,3	YNMJ-2	Method Blank
Phenol	20	ND	33	ND
2-Chlorophenol	20	ND	ND	ND
2-Methylphenol	20	ND	ND	ND
3- and 4-Methylphenol*	20	ND	ND	ND
2-Nitrophenol	20	ND	ND	ND
2,4-Dichlorophenol	20	ND	ND	ND
2,4-Dimethylphenol	20	ND	ND	ND
4-Chloro-3-methylphenol	20	ND	ND	ND
2,4,6-Trichlorophenol	20	ND	ND	ND
2,4,5-Trichlorophenol	20	ND	ND	ND
2,4-Dinitrophenol	50	ND	ND	ND
4-Nitrophenol	50	ND	ND	ND
2-Methyl-4,6-dinitrophenol	50	ND	ND	ND
Pentachlorophenol	50	ND	ND	ND

* Quantified as 4-methylphenol.

Approved By: _____

Date: 4/6/95

3S22/120594

017155VM.NH1 - Phenols 4/6/95

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APPENDIX A
LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

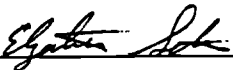
QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: NA
Date Analyzed: 3/29/95

Duplicate Summary
Sulfide, Acid Volatile
EPA Method Draft Dec '91
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Batch QC	K9501663-001	0.5	75	65	70	14

Approved By: Date: 4/14/95

DUP1A/102194

01715ICP.GJ1 - DUP (2) 4/14/95

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00011

COLUMBIA ANALYTICAL SERVICES, INC.

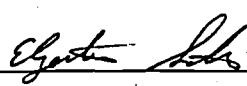
QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: NA
Date Analyzed: 3/29/95

Matrix Spike Summary
Sulfide, Acid Volatile
EPA Method Draft Dec '91
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Batch QC	K9501663-001	0.5	2700	75	3400	123	75-125

Approved By: Date: 4/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

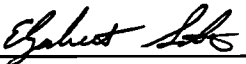
QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: NA
Date Analyzed: 4/7/95

Duplicate Summary
Total Organic Carbon (TOC)
ASTM Method D4129-82 Modified
Units: Percent (%)
Dry Weight Basis

Sample Name	Lab Code	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
YNMJ-1,3 Composite	K9501715-003	0.05	0.73	0.73	0.73	< 1

Approved By: 

Date: 4/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/30/95
Date Analyzed: 4/4/95

Duplicate Summary
Total Metals
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name: YNMJ-2
Lab Code: K9501715-004

Analyte	EPA Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Arsenic	200.8	0.5	4.5	4.5	4.5	<1
Cadmium	200.8	0.02	0.15	0.20	0.18	28
Chromium	200.8	0.2	20.7	19.9	20.3	4
Copper	200.8	0.05	7.57	7.29	7.43	4
Lead	200.8	0.02	3.58	3.38	3.48	6
Mercury	7471	0.02	ND	0.03	NC	NC
Nickel	200.8	0.2	16.0	15.3	15.6	4
Zinc	200.8	0.5	29.8	30.0	29.9	1

Approved By: EgatesDate: 4/14/95

DUP1SEPA/102194

01715ICP.GJ1 - DUP 4/14/95

Page No.:
00011

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

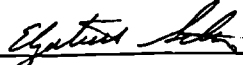
Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/30/95
Date Analyzed: 4/4/95

Matrix Spike Summary
Total Metals
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name: YNMJ-2
Lab Code: K9501715-004

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS
						Percent Recovery Acceptance Limits
Arsenic	0.5	27	4.5	28.1	87	60-130
Cadmium	0.02	6.7	0.15	6.24	91	60-130
Chromium	0.2	27	20.7	46.5	96	60-130
Copper	0.05	34	7.57	38.3	90	60-130
Lead	0.02	67	3.58	73.8	105	60-130
Mercury	0.02	0.07	ND	0.09	130	60-130
Nickel	0.2	67	16.0	79.9	95	60-130
Zinc	0.5	67	29.8	87.9	87	60-130

Approved By: 

Date: 4/14/95

MSIS/102194

01715ICP.G/1 - Spike 4/14/95

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/29/95
Date Analyzed: 4/7/95

Surrogate Recovery Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) - Low Level
EPA Methods 3550/8080

Sample Name	Lab Code	Percent Recovery	Percent Recovery
		Tetrachloro- <i>m</i> -xylene	Decachlorobiphenyl
YNMJ-1,3 Composite	K9501715-003	60	66
YNMJ-2	K9501715-004	75	58
Batch QC	K9501682-003	46	47
Batch QC	K9501682-003MS	56	52
Batch QC	K9501682-003DMS	41	50
Lab Control Sample	K950329-LCS	55	74
Method Blank	K950329-MB	62	72

CAS Acceptance Limits:

26-124

31-146

Approved By: *Tram* Date: 4/12/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

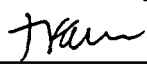
Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/29/95
Date Analyzed: 4/7/95

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) - Low Level
EPA Methods 3550/8080
Units: mg/Kg (ppm)
Dry Weight Basis

Sample Name: Batch QC
Lab Code: K9501682-003

Analyte	Percent Recovery								Relative Percent Difference
	Spike Level		Sample Result	Spike Result		CAS Acceptance Limits			
	MS	DMS		MS	DMS	MS	DMS		
Heptachlor	0.024	0.024	ND	0.012	0.015	50	63	27-130	22
Aldrin	0.024	0.024	ND	0.019	0.019	79	79	28-127	<1
Gamma-BHC (Lindane)	0.024	0.024	ND	0.012	0.017	50	71	28-127	34
Endrin	0.024	0.024	ND	0.014	0.018	58	75	27-153	25
4,4'-DDT	0.024	0.024	ND	0.015	0.018	63	75	27-151	18
Dieldrin	0.024	0.024	ND	0.012	0.014	50	58	29-142	15

Approved By: Date: 4/12/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
LCS Matrix: Soil

Service Request: K9501715
Date Collected: NA
Date Received: NA
Date Extracted: 3/29/95
Date Analyzed: 4/7/95

Laboratory Control Sample Summary
Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) - Low Level
EPA Methods 3550/8080
Units: mg/Kg (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Heptachlor	0.017	0.012	71	33-130
Aldrin	0.017	0.012	71	31-126
Gamma-BHC (Lindane)	0.017	0.013	76	35-126
Endrin	0.017	0.014	82	45-133
4,4'-DDT	0.017	0.014	82	39-143
Dieldrin	0.017	0.012	71	42-135

Approved By: TKarnDate: 4/12/95

QA/QC Report

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/28/95
Date Analyzed: 4/7/95

Sample Name	Lab Code	Percent Recovery
		Tripropyltin
YNMJ-1,3 Composite	K9501715-003	85
YNMJ-2	K9501715-004	57
YNMJ-2	K9501715-004MS	63
YNMJ-2	K9501715-004DMS	72
Lab Control Sample	K950328-SL1	61
Method Blank	K950328-SB1	48

* Methodology based on C.A.Krone, et al., "A Method for Analysis of Butyltin Species and Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound," National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Seattle, WA, November 1988.

SUROTS/060194

01715SYM.KY1 - BuSn Sur 4/10/95

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QA/QC Report

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/22/95
Date Extracted: 3/28/95
Date Analyzed: 4/7/95

Butyltins*

Sample Name: YNMJ-2
Lab Code: K9501715-004

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery			
	MS	DMS		MS	DMS	CAS Acceptance Limits		Relative Percent Difference	
						MS	DMS		
Tributyltin	24	24	ND	19	20	79	83	-	5

* Methodology based on C.A.Krone, et al., "A Method for Analysis of Butyltin Species and Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound," National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Seattle, WA, November 1988.

Approved By: [Signature] Date: 4/10/95

00020

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
LCS Matrix: Soil

Service Request: K9501715
Date Collected: NA
Date Received: NA
Date Extracted: 3/28/95
Date Analyzed: 4/7/95

Laboratory Control Sample Summary
Butyltins*
Units: $\mu\text{g/Kg}$ (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Tributyltin	18	14	78	-

* Methodology based on C.A.Krone, et al., "A Method for Analysis of Butyltin Species and Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound," National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Seattle, WA, November 1988.

Approved By: _____

Date: 4/12/95

LCSOTS/060194

01715SVM.KY1 - BuSn LCS 4/10/95

Page No.:

00021

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: 3/15/95
Date Received: 3/21/95
Date Extracted: 3/27/95
Date Analyzed: 3/30-4/3/95

Surrogate Recovery Summary
Phthalate Esters and Polynuclear Aromatic Hydrocarbons and Phenols
EPA Method 3550 in combination with GC/MS SIM Method

Sample Name	Lab Code	NAP	P e r c e n t		R e c o v e r y		
			FLR	CRY	2FP	PHL	TBP
YNMJ-1,3 Composite	K9501715-003	22	33	26	20	23	30
YNMJ-2	K9501715-004	53	86	70	52	62	84
Batch QC	K9501663-002	60	86	70	53	65	84
Batch QC	K9501663-002MS	54	85	66	52	63	99
Batch QC	K9501663-002DMS	55	89	71	56	69	110
Lab Control Sample	K950327-SL1	64	91	72	49	63	67
Method Blank	K950327-SB1	62	79	67	46	60	41

CAS Acceptance Limits: 17-100 15-135 10-138 13-114 D-161 D-134

NAP	Naphthalene-d8
FLR	Fluorene-d10
CRY	Chrysene-d12
2FP	2-Fluorophenol
PHL	Phenol-d6
TBP	2,4,6-Tribromophenol

Approved By: _____

Date: _____

4/6/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
Sample Matrix: Soil

Service Request: K9501715
Date Collected: NA
Date Received: NA
Date Extracted: 3/27/95
Date Analyzed: 3/30-4/3/95

Matrix Spike/Duplicate Matrix Spike Summary
Phthalate Esters and Polynuclear Aromatic Hydrocarbons and Phenols
EPA Method 3550 in combination with GC/MS SIM Method
Units: $\mu\text{g/Kg}$ (ppb)
Dry Weight Basis

Sample Name: Batch QC
Lab Code: K9501663-002

Analyte	Percent Recovery								Relative Percent Difference
	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	
	MS	DMS		MS	DMS	MS	DMS		
Acenaphthene	430	430	ND	240	240	56	56	16-132	-
Pyrene	430	430	190	390	380	47	44	6-159	3
Benzo(a)pyrene	430	430	90	290	290	47	47	D-159	-
Pentachlorophenol	430	430	ND	330	330	77	77	10-120	-

D Detected; result must be greater than zero.

Approved By: _____

Date: 4/6/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: U.S. Army Corps of Engineers
Project: Newport North Marina Jetty Sediment/#95-0191
LCS Matrix: Soil

Service Request: K9501715
Date Collected: NA
Date Received: NA
Date Extracted: 3/27/95
Date Analyzed: 3/30-4/3/95

Laboratory Control Sample Summary
 Phthalate Esters and Polynuclear Aromatic Hydrocarbons and Phenols
 EPA Method 3550 in combination with GC/MS SIM Method
 Units: µg/Kg (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Acenaphthene	500	290	58	39-121
Pyrene	500	330	66	32-136
Benzo(a)pyrene	500	300	60	D-159
Pentachlorophenol	500	350	70	10-120

D Detected; result must be greater than zero.

Approved By: _____

LCS/120594

01715SVM.NH1 - LCS 4/6/95

Date: _____

4/6/95

Page No.:

00024

APPENDIX B
CHAIN OF CUSTODY INFORMATION

Army Corps of Engineers
Cooler Receipt Form

Project: NEWPORT NORTH MARINA JETTY SEDIMENT

Cooler received on 3/22 and opened on 3/22 by LB

1. Were custody seals on outside of cooler? YES NO
If yes, how many and where? 2
Were signature and date correct? YES NO
2. Were custody papers taped to lid inside cooler? YES NO
3. Were custody papers properly filled out (ink, signed, etc.)? YES NO
4. Did you sign custody papers in the appropriate place? YES NO
5. Did you attach shipper's packing slip to this form? YES NO
6. What kind of packing material was used? _____
7. Was sufficient ice used (if appropriate)? YES NO
8. Were all bottles sealed in separate plastic bags YES NO
9. Did all bottles arrive in good condition (unbroken)? YES NO
10. Were all bottle labels complete (No., date, signed, analysis, pres., etc)? YES NO
11. Did all bottle labels and tags agree with custody papers? YES NO
12. Were correct bottles used for the tests indicated? YES NO
13. Were VOA vials checked for absence of air bubbles, and noted if so? YES NO
14. Was sufficient amount of sample sent in each bottle? YES NO
15. Temperature of cooler(s) upon receipt: 7.6°C _____
Identification number of thermometer: #20 _____
Is the temperature within $4 \pm 2^\circ \text{C}$?
Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐

Explain any discrepancies _____

00027

APPENDIX C

RAW DATA

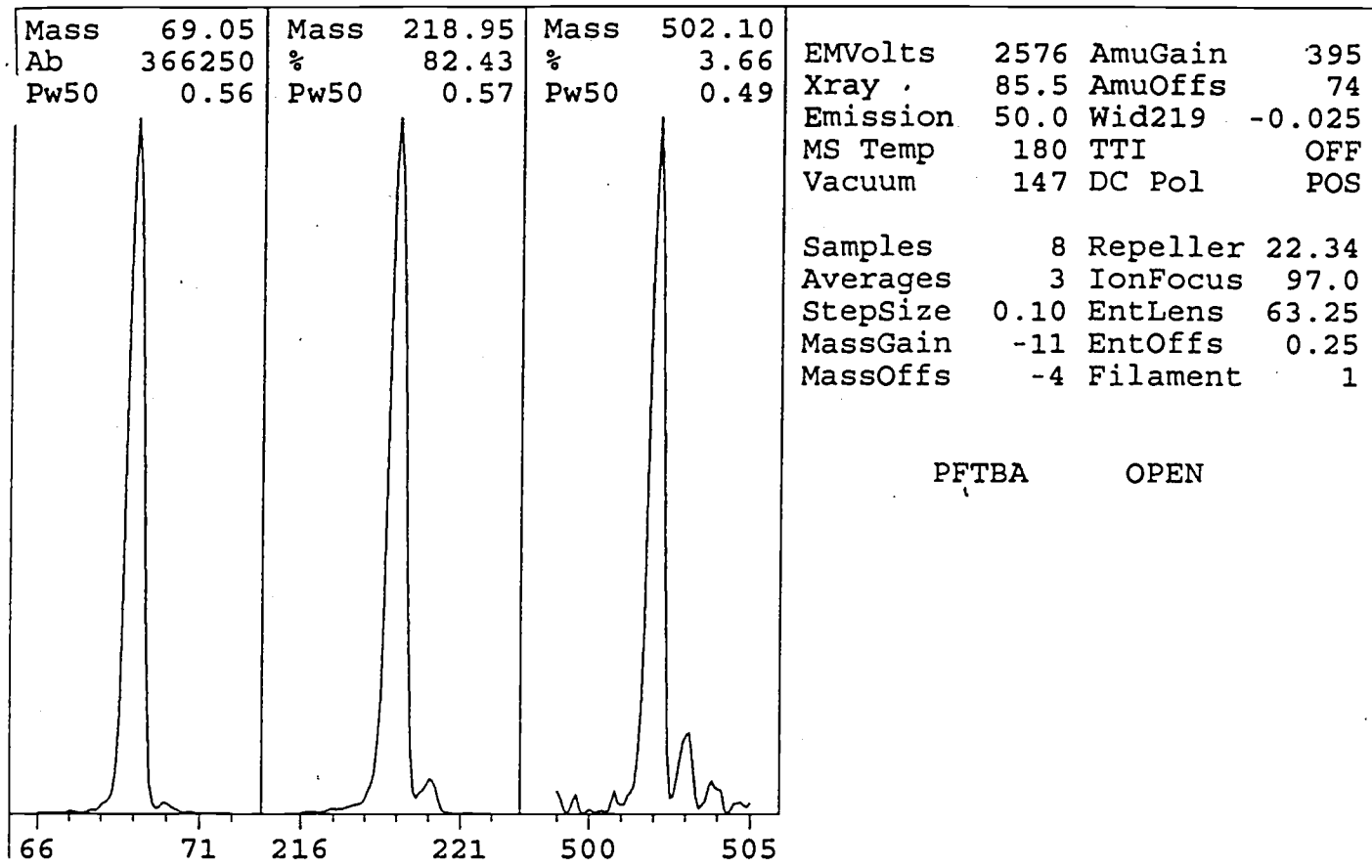
00028

~~00028~~

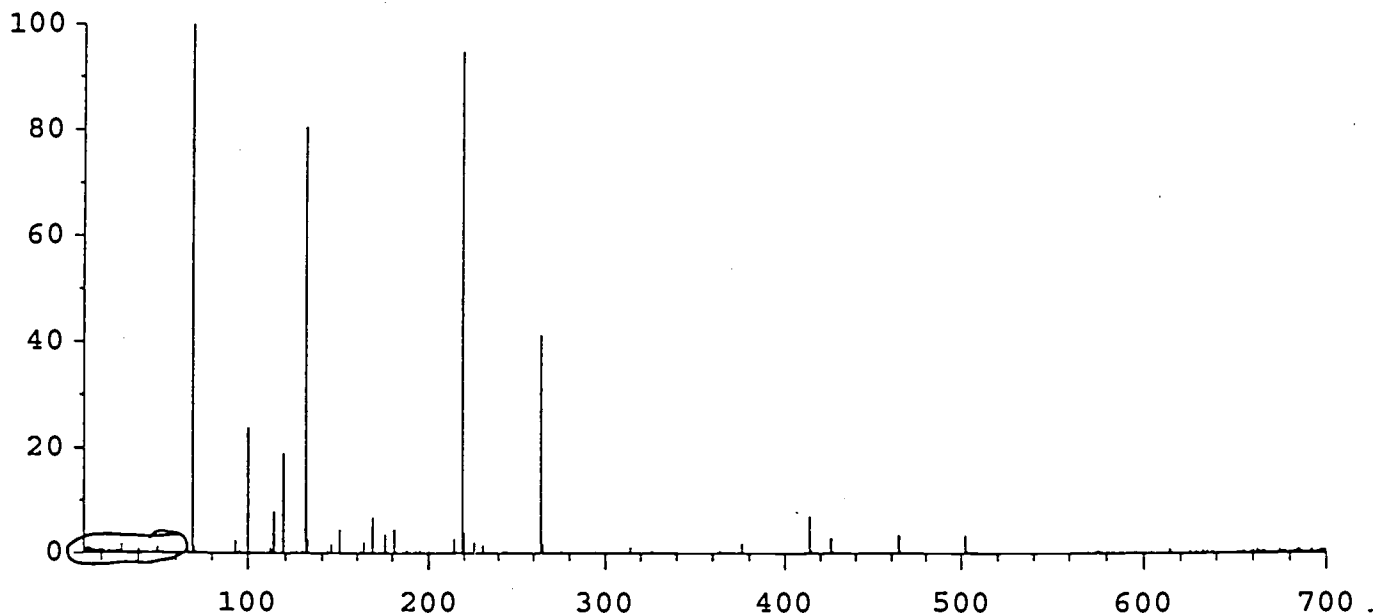
Instrument: MS07

Fri Apr 07 14:19:58 1995

J:\MS07\TUNES\SIM02.U



Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10
 797 peaks Base: 69.05 Abundance: 306560



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.05	306560	100.00	70.05	4139	1.35
218.90	290496	94.76	219.90	12227	4.21
502.10	10576	3.45	503.10	1361	12.87

COPY

00030

Boat Basin West, F1W
Elev 241
371,465

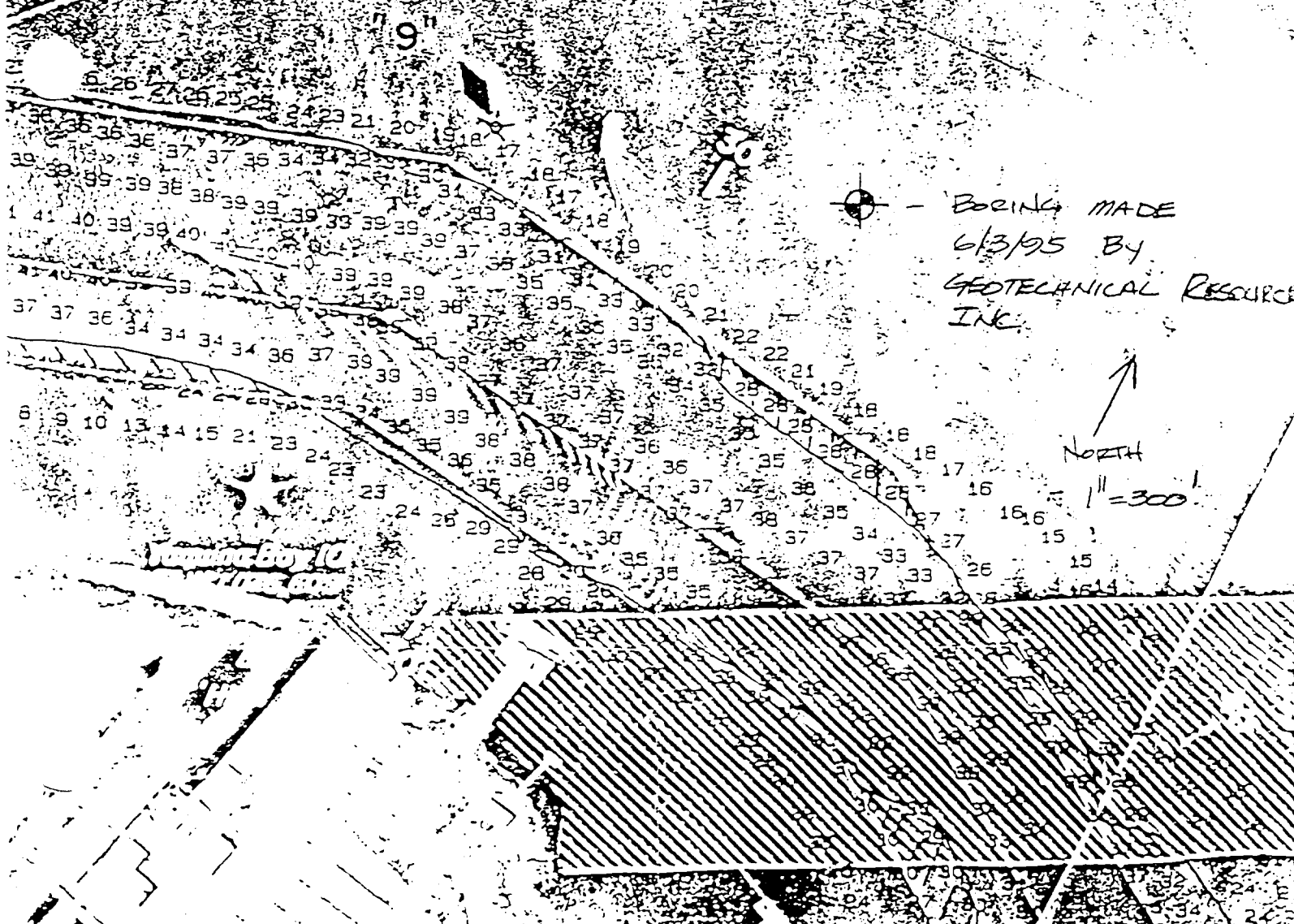
Yaquina Bay Inner Range
Rear, Elev R 1,076,763
371,460

Yaquina Bay Inner Range
Front, Elev R 1,076,487
371,464

BOILING MADE
6/3/95 BY
GEOTECHNICAL RESOURCE
INC.

↑
NORTH
1"=300'

Yaquina Bay 10
Elev 241



GEOTECHNICAL RESOURCES, INC.
Engineers, Geologists, and Environmental Scientists
9725 SW Beaverton-Hillsdale Hwy., Suite 140
Beaverton, OR 97005-3364
(503) 641-3478 FAX (503) 644-8034

LETTER OF TRANSMITTAL

Date: June 6, 1995

Job No: 1864

Re: COE NEWPORT BAY

To: Rich Hannan
U.S. Army Corps of Engineers
Portland District
333 SW First Avenue, 9th Floor
Portland, OR 97204

Copies	Dated	Contents
1	6/3/95	BORINGS DH-A, DH-B, DH-C, AND DH-D
1	--	SITE MAP
1	--	JAR SAMPLES

THESE ARE TRANSMITTED as checked below:

☒ For your use ☐ As requested ☐ For approval ☐ For review and comment

REMARKS:

COPY TO:

BY: Michael W. Reed, P.E./md

SENT VIA: ☐ Regular Mail

☒ Courier

☐ Overnight/UPS

☐ Hold for Pick Up



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Beaverton, OR 97005
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GRI Rep.	DKF
Page 1 of 1	Job No. 1864
Date 6/3/95	Boring No. PH-A

Location	Project COE NEWPORT
Drill Method MUD ROTARY	Driller GED - TECH EXPLORATIONS

Depth	Intvl	Sample No./SPT	Rec. (in.)	Description	Remarks
4.0		S-1 2-1-1 H=2	11	LOOSE, DARK GRAY SILTY SAND; FINE-GRAINED, TRACE ORGANICS, SCATTERED SHELL FRAGMENTS	* W.D. = 22 ft (6:45 AM) W.L. = +3.5 ft MUDLINE ELEV = -18.5 ft
5		S-2 8-28-40 H=68	5"	SOFT (PH-1) GRAY SILTSTONE/ CLAYSTONE	- STIFFER @ 4' ft + BASED ON DRILLING N80°E (80°) S20°W (200°) W.L. = +1.5 8:30 AM
10		S-3 20-50-50 1/2" H=100 1/2"	13"	11.3 ft (6/3/95)	
5					* W.D. = WATER DEPTH W.L. = WATER LEVEL
20					
25					



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GRI Rep. DFF

Page 1 of 1

Job No. 1864

Date 6/3/95

Boring No. DH-B

Location

Project COE NEWPORT

Drill Method

MUD ROTARY

Driller GEO-TECH

Depth	Int.	Sample No./SPT	Rec. (in.)	Description	Remarks
				UPPER 1-2 ft loose BASED ON DRIVING CASING	W.D. = 5.0 ft 120 pm W.L. = 3.0 ft MUDLINE ELEV = +2.0 ft
5	I	S-1 6-7-7 N=14	8"	MEDIUM DENSE, GRAY SAND; TRACE SILT, FINE-GRAINED	
10	I	S-2 7-8-10 N=18	10"		
	I	S-3 9-10-17 N=27	10"	-- SCATTERED GRAVEL AND SHELL FRAGMENTS BELOW 15 ft	
20	I	S-4 7-16-20 N=36	13"	-- DENSE BELOW 20 ft SCATTERED SHELL FRAGMENTS TRACE to SOME SILT	W.L. = +5 ft 2:30 pm
25	I	S-5 6-15-20 N=35	12"		
				26.5 ft (6/3/95)	



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GRI Rep. **DKF**
Job No. **1864**
Boring No. **PH-C**

Page **1** of **1**

Date **6/3/95**

Location

Project **COE NEWPORT**

Drill Method

MUD ROTARY

Driller

GEO-TECH

Depth	Intv	Sample No./SPT	Rec. (in.)	Description	Remarks
2.0		S-1 2-1-1 4=2	10"	^{PTRE} loose, GRAY SAND; SOME SILT TO SILTY, FINE-GRAINED, CONTAINS SCATTERED ORGANICS, SHELL AND GLASS FRAGMENTS, GRAY SILTSTONE IN SAMPLER SIDE	W.O. = 18 ft W.L. = +0.5 MUDLINE ELEV = -17.5 ft 9:15 AM
5		S-2 39-50 2/3"	7"	SOFT TO MEDIUM SOFT (RH-1) GRAY SILTSTONE, PARTING DISCERNIBLE ALONG BEDDING PLANES ORIENTED NEARLY HORIZONTAL	N 70 W (290°) N 25 W (335°) W.L. = 0 ft 10 AM
10		S-3 50-50 1/2"	6"		

10.7 ft (6/3/95)



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GRI Rep. DKF

Page 1 of 1

Job No. 1864

Date 6/3/95

Boring No. DH-D

Location

Project COE NEWPORT

Drill Method

MUD ROTARY

Driller GFD-TECH EXPLORATIONS

Depth	Instr.	Sample No./SPT	Rec. (in.)	Description	Remarks
5		S-1 2-1-1	4"	LOOSE, DARK GRAY SAND, TRACE TO SOME SILT, FINE-GRAINED	W.D. = 2.0 ft W.L. = +1.0 ft 11:15 AM MUDLINE ELEV = -1.0 ft
10		S-2 0-0-0 N=0	NR		-- SAMPLER SANK 1.5 ft UNDER STATIC WT. OF 140 lb HAMMER + 15 ft OF N-ROP
15		S-3 6-7-10 N=17	12"	-- MEDIUM DENSE, GRAY, TRACE SILT, BELOW 10 ft.	CASING SANK ABOUT 1.5 ft ALSO
18.5		S-4 7-7-9 N=16	12"		W.L. = +2 ft 12:30 PM
20		S-5 16-30-50 5 1/2	13"	SOFT (RH-1) GRAY SILTSTONE/CLAYSTONE	
25		S-6 31-50 1/4"		22.8 ft (6/3/95)	