

DRAFT

**Sediment Characterization Report
Port of Vancouver, Gateway
Expansion - Vessel Approach and
Turning Basin Project**

Prepared for

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CITATION

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	III
1. INTRODUCTION AND BACKGROUND INFORMATION	1
1.1 PROJECT LOCATION AND DESCRIPTION.....	1
1.2 SITE DESCRIPTION AND HISTORY	2
2. SAMPLING APPROACH.....	3
2.1 SEDIMENT INVESTIGATION OBJECTIVES AND DESIGN.....	3
2.2 NUMBER AND TYPE OF SEDIMENT SAMPLES.....	3
2.3 SAMPLE STATION LOCATIONS	4
3. FIELD SAMPLING METHODS.....	5
3.1 STATION POSITIONING METHODS.....	5
3.2 SAMPLING EQUIPMENT	5
3.3 SAMPLE COMPOSITING STRATEGY AND METHODS.....	5
3.3.1 Compositing Strategy	5
3.3.2 Compositing Method.....	6
3.4 FIELD DOCUMENTATION	7
4. SAMPLE HANDLING PROCEDURES	8
4.1 SAMPLE STORAGE	8
4.2 CHAIN-OF-CUSTODY PROCEDURES	8
5. LABORATORY ANALYTICAL METHODS	9
5.1 CHEMICAL ANALYSIS.....	9
5.2 PHYSICAL ANALYSIS	9
5.3 LABORATORY CORRECTIVE ACTIONS	9
6. QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS.....	11
6.1 QA/QC FOR CHEMICAL ANALYSES.....	11
6.2 DATA QUALITY ASSURANCE REVIEW	11
7. SEDIMENT DATA RESULTS.....	12
7.1 GENERAL PHYSICAL CHARACTERISTICS	12
7.2 ANALYSIS OF SEDIMENT CHEMISTRY DATA	12
7.3 PROJECT-SPECIFIC RESULTS AND DISCUSSION.....	12
8. REFERENCES	13

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

- 1-1 Vicinity Map – Port of Vancouver
- 1-2 Columbia Gateway Detail Plan
- 1-3A Dredged Material Management Units and Proposed Sampling Locations
- 1-3B Dredged Material Management Units and Proposed Sampling Locations
- 1-4 Dredging Profile Cross-Sections A and B
- 1-5 Dredging Profile Cross-Section C
- 2-1A Actual Sediment Sampling Locations
- 2-1B Actual Sediment Sampling Locations

LIST OF TABLES

- 1 Sediment Analytes
- 2 Sediment Sampling Locations
- 3 Grain Size, Total Organic Carbon, and Total Solids
- 4 Analytical Data

APPENDICES

- A Sampling and Analysis Plan Approval Documentation
- B Field Documentation
- C Laboratory Data Reports and Data Validation Memoranda

EXECUTIVE SUMMARY

The Port of Vancouver (the Port) proposes to dredge approximately 2,030,000 cubic yards of sediment material from the Columbia River in an area adjacent to the north side of the Federal Navigation Channel between River Mile (RM) 101 and 102 to accommodate a vessel approach and turning basin. The Port is proposing to maintain the turning basin at the proposed depth of 48 feet (43 feet plus 5 feet advance maintenance over dredge) below Columbia River Datum (CRD) for a period of 20 years, with approximately 260,000 cubic yards of dredge material being removed for maintenance every 4 years (i.e., 1,300,000 total cubic yards over 20-year period). The proposed project includes the construction of new berthing piers offshore of the 20 ft contour to accommodate large vessels.

Material will be removed using either a clamshell bucket dredge or a cutterhead suction dredge operated from a barge. No dredging is proposed above the -20 ft CRD, and the dredge cut slope will be 3:1 (or less) to minimize sloughing.

Dredged material will likely be disposed of as fill in an upland location at the Port of Vancouver Gateway site. This dredged material will likely be stockpiled near the Columbia River on Port of Vancouver property and will be dewatered, with return water flowing to the Columbia River.

In support of this project, Parametrix prepared, submitted, and received approval of a Draft Sediment Sampling and Analysis Plan (SAP) (Parametrix 2006) to conduct characterization of sediments proposed for removal during construction of the new vessel approach and turning basin. The SAP was developed according to the Dredged Material Evaluation Framework (DMEF) (USACE 1998).

Sediment characterization was conducted to evaluate sediment conditions and confirm that sediments and new surface material (NSM) in the dredging area are in compliance with DMEF and other relevant sediment quality criteria. In light of the sediment being disposed in an upland area on Port property, dredge material was also evaluated against applicable Model Toxics Control Act (MTCA) (WAC 173-340) criteria.

Samples were collected in October 2006, and were analyzed for the chemical and conventional sediment parameters listed in Table 8-1 of DMEF guidance (USACE 1998). A total of fifty-two sediment cores were collected as part the project. The sediment cores were processed, composited, and submitted for analysis by Severn Trent Laboratories, Inc. (STL) in Tacoma, Washington.

Results of the analyses reveal that all of the specified analytes are below DMEF, MTCA, and other relevant screening levels. As such, the sediment to be removed is acceptable for upland disposal.

1. INTRODUCTION AND BACKGROUND INFORMATION

A Draft Sediment Sampling and Analysis Plan (SAP) (Parametrix 2006) was developed in support of permit application for dredging at the Port of Vancouver (POV), Washington. Dredging is proposed as part of the POV – Gateway Expansion, Vessel Approach and Turning Basin Project and is designed to provide access for deep-draft cargo vessels at the proposed docks at Parcel 3 (Figure 1-2). The project will require the initial removal of approximately 1,950,000 cubic yards of sediment from the Columbia River adjacent to the POV facility. It is anticipated that dredged material will be disposed in an upland area on POV property.

Sediment characterization was conducted in October 2006 to evaluate sediment conditions and confirm that sediments in the dredge prism are characterized according to the Dredged Material Evaluation Framework (DMEF) and other relevant criteria, as approved by the Regional Management Team (RMT).

1.1 PROJECT LOCATION AND DESCRIPTION

The Gateway Expansion project location is Parcel 3 in the northern undeveloped portion of the Port of Vancouver along the Columbia River, between approximately RM 101 and 102. The project site lies in Section 40, Township 2 North, Range 1 West, Vancouver, Clark County, Washington, as illustrated on the Sauvie Island Oregon – Washington Quadrangle, United States Geological Survey 7.5 Minute Series. The site is known as the Columbia Gateway property. The proposed dredge prism is located on the Washington side of the Federal Navigation Channel, opposite the Columbia River confluence of the Willamette River (Figure 1-1). The project address is:

3103 Lower River Road
Vancouver, WA 98660

The Port of Vancouver proposes to dredge material from the Columbia River in an area adjacent to the north side of the Federal Navigation Channel, generally between RM 101 and 102, to accommodate a vessel approach and turning basin. The Port is proposing to maintain the turning basin at the proposed depth of 48 feet (43 feet plus 5 feet advance maintenance over dredge) below Columbia River Datum (CRD) for a period of 20 years, with approximately 260,000 cubic yards of dredge material being removed for maintenance every 4 years (i.e., 1,300,000 total cubic yards over 20-year period). The proposed project includes the construction of new berthing piers offshore of the 20 ft contour to accommodate large vessels, as shown in Figure 1-2. Further details of the area from which material is proposed to be dredged are shown in Figures 1-3A and 1-3B, which also show the proposed sediment sampling locations.

Material will be removed using either a clamshell bucket dredge or a cutterhead suction dredge operated from a barge. No dredging is proposed above the -20 ft CRD, and the dredge cut slope will be 3:1 (or less) to minimize sloughing (Figures 1-4 and 1-5).

Dredged material will likely be disposed of as fill in an upland location at the Port of Vancouver Gateway site. This dredged material will likely be stockpiled near the Columbia River on Port of Vancouver property and will be dewatered, with return water flowing to the Columbia River.

1.2 SITE DESCRIPTION AND HISTORY

The Port of Vancouver is located on the Columbia River between RM 101 and 105 in Vancouver, Washington. The Port of Vancouver includes berths for Break Bulk, Dry Bulk, Liquid Bulk and Auto unloading facilities. The Break Bulk facility, managed by the Port, handles a wide range of commodities, including pulp, lumber, plywood, and steel. Dry bulk includes grain, fertilizer, and metal ores. The liquid bulk dock handles bulk fuels; the floating auto dock is capable of high volume automobile unloading, sorting and staging.

The Port of Vancouver is primarily zoned Heavy Industrial, and light industrial with a River Industrial overlay by the City of Vancouver. The proposed Columbia Gateway project site is located between the Columbia River and Vancouver Lake in the northern portion of the Port of Vancouver property, approximately between RM 101 and 102. The expanded area is proposed for use as a Grain/Bulk Facility, Auto Facility and Industrial area.

2. SAMPLING APPROACH

2.1 SEDIMENT INVESTIGATION OBJECTIVES AND DESIGN

The sediment monitoring objectives for work described in this report include:

- Collect sediment within the proposed dredging area and determine whether the sediments to be dredged meet the applicable screening levels.
- Collect chemical and physical information to support upland disposal or reuse decisions.
- Collect chemical and physical information for sediments below the dredge prism to determine if chemical contaminants would be present in the new surface material (NSM).

The sediment investigation followed the DMEF (USACE 1998) and the Sediment Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-204 WAC) (SAPA) (PTI and McFarland 1995). The Port of Vancouver SAP was approved by the RMT on August 21, 2006. SAP approval documentation is contained in Appendix A.

Samples were collected in October 2006 and were analyzed for the chemicals and conventional sediment parameters listed in Table 8-1 of DMEF guidance, which is reproduced herein as Table 1.

2.2 NUMBER AND TYPE OF SEDIMENT SAMPLES

The DMEF guidance document describes the process by which the number of samples within a proposed dredge area is determined. Factors include river mile location in the Columbia River, type of facility, proximity to known chemical contaminant sources, and recent data from the site.

The Port of Vancouver proposed dredge area, between RM 101 and 102, is within RMs 0 to 106, which are generally considered “exclusionary” in the main stem of the Columbia River. The exclusionary ranking is based on available data that indicate that sediments within the Federal Navigation Channel of the Columbia River generally consist of coarse-grained sediment with at least 80 percent sand and a Total Volatile Solids (TVS) content of less than 5.0 percent. Sediments that are composed of greater than 80 percent sand, gravel or other naturally occurring bottom material and that have a TVS content of less than 5.0 percent, or sediments that meet this requirement and are targeted for beach nourishment or restoration, are excluded from further testing for aquatic disposal in the Lower Columbia River Management Area, provided that the sediments are not located within the likely impact zone of an active and significant contaminant source.

Sediments within the Federal Navigation Channel at RM 101 and 102 generally consist of material containing greater than 80 percent sand. However, available data from recent studies conducted in the region indicate the potential for sediments in the proposed dredge area to contain low concentrations of chemicals of concern, particularly PCBs. Table 5-2 of the DMEF indicates that those sites where available data indicate the potential for low concentrations of contaminants of concern (CoCs) to exist in the sediments will be given a low ranking. However, in addition to the project site being an area in which offshore barge staging occurs the project site is also located downstream of several potential sources of contamination. As a result, the site was given a moderate ranking by the RMT.

Table 6-1 of the DMEF indicates that for a moderate-ranked site, the number of samples to collect is one sample per 40,000 cubic yards of dredged material for homogeneous sediments. The proposed volume of sediments to be dredged is 1,950,000 cubic yards, resulting in 49 individual dredged material management units (DMMUs). Immediately prior to sediment sampling mobilization, it was determined that the proposed dredge volume may increase, pending additional engineering evaluation; the increase in dredged material volume was estimated to be 80,000 cubic yards. As a result, conservative application of the DMEF sampling intensity formula resulted in 3 additional DMMUs, for a total of 52 DMMUs (core/sample locations) and an approximate total of up to 2,030,000 cubic yards of material to be dredged.

2.3 SAMPLE STATION LOCATIONS

The locations of samples were determined based on dividing the entire dredge prism into 52 individual DMMUs, each representing approximately 40,000 cubic yards of sediment. Proposed sampling stations were located in the approximate center of each DDMU (see Figures 1-3A and 1-3B). Actual sampling locations are shown in Figures 2-1A and 2-1B. Analytical results are discussed in Section 7.

3. FIELD SAMPLING METHODS

3.1 STATION POSITIONING METHODS

Prior to mobilizing onto the river, sample location coordinates (latitude and longitude) were determined using CAD/GIS software. Once in the field, station positioning was accomplished from the sampling vessel using a differential global positioning system (DGPS). The coordinates of each sample location were entered into the on-board DGPS computer and displayed onscreen with a real-time indicator of the boat's position. The sampling vessel then set up in the pre-determined location, and, once on location, the DGPS was used to document the actual sampling position coordinates at the time the samples were collected. Actual sample coordinates were recorded on the core log sheet along with water depth measurements. For all sampling stations, latitude and longitude were recorded in the North American Datum (NAD83). Water depths recorded were later converted to elevations based on Columbia River Datum. Table 2 presents the in-field coordinates for each sampling location along with the mud line elevations and sample recovery for each location.

Prior to the sampling event, dredge prism cross-sections (from shore to toe of dredge prism) were generated such that sediment core locations could be plotted on the cross-section. This, along with record of the percent recovery (or core length) for each core, enabled field personnel to plot the core and determine which portions of the core represent material to be dredged and which portions represent NSM. The depth of the dredge prism is substantially less at the toe than it is at the shoreward edge of the prism. Appendix B includes copies of the cross-sections used in the field.

3.2 SAMPLING EQUIPMENT

Sediment cores were collected using a vibrocoker and pre-decontaminated 4-inch diameter aluminum core barrels supplied by the sampling vessel operator.

Stainless steel bowls, spoons, and other sampling utensils were used in the collection of the sediment samples and were decontaminated prior to sampling and sealed in aluminum foil unless used immediately after decontamination. The decontamination process utilized the following sequence:

- Initial wash and scrub with Alconox and site water
- Rinse and scrub with site water
- Rinse again with site water
- Rinse a final time with purified (de-ionized) water

Items such as aluminum foil upon which the sediment cores were laid was disposed of and replaced between each sample collection to ensure that the subsequent cores processed did not come in contact with residuals from the previous pair of cores.

3.3 SAMPLE COMPOSITING STRATEGY AND METHODS

3.3.1 Compositing Strategy

Sediment cores were collected from within each of the 52 DMMUs, the locations of which are shown in Figures 2-1A and 2-1B. As specified in the SAP, it was initially proposed that samples would be collected from each core in 4-foot intervals and analyzed separately, and

material representing NSM, if any, would be archived and sampled pending results of chemical analysis of the overlying sediment samples. However, during SAP revision negotiations with the regulating agencies, a revised sampling scheme was suggested and approved (Appendix A). The revised sampling scheme allowed for compositing the uppermost 10 feet of core sample from two adjacent DMMUs into one sample; NSM material would still be archived as initially prescribed. This modified sampling scheme resulted in a total of 26 samples, each of which represented 2 DMMUs. One duplicate sample was also collected for a total of 27 samples.

Although samples were composited over 10-foot intervals, discrete samples were concurrently collected from every 4-foot core interval and archived separately for possible follow-up analysis should any of the analyzed composite samples prove to be contaminated. If analytical results indicated contamination in the composite samples, having the archived samples on hand would allow for additional sub-analysis and more precise determination as to where the contamination, if any, occurs. Also, and equally important, the 4-foot interval scheme is conducive to real world dredging and sediment management in which material is typically handled in 4-foot lifts (penetration of dredge clamshell bucket).

3.3.2 Compositing Method

Following retrieval of the sediment cores and placement on the deck of the sampling vessel, the percent recovery was determined for each core. The portion of core containing sediment was then cut into 4-foot increments (typically 2 or 3 sections) and capped for storage on-board until processed. Prior to capping, the nature of the sediments visible at the top of each core and at the divisions between each core section was noted on the core log sheet. The cores were removed from the sampling vessel at the end of the each work day and stored overnight in a locked 16-ft truck or immediately transported to the processing facility for storage. While in overnight storage, the cores were kept on ice and in an upright position.

Core processing was initiated on the day following collection of each core. Core sections were split longitudinally using a circular saw and then placed onto the processing table along with the core sections from an adjacent DMMU (composite pair). Once opened, the sediment was described by the project geologist and logged on the sediment core log sheets. Copies of the sediment core log sheets are presented in Appendix B.

The next processing step first required identifying whether material in the cores represented sediment to be dredged or NSM (sediment to be dredged could be composited with the adjacent core while NSM was to be archived). This determination was made by plotting the location and length of the core on the dredge prism cross-sections mentioned above (see Appendix B). This enabled personnel to graphically represent the location of the core with respect to the upper and lower limits of the dredge prism, and also indicated the depth to which the core penetrated.

Once it was determined which portions of the sediment core were to be composited for analysis, equal volumes of sediment from the core pair were placed in stainless steel bowls and thoroughly mixed. The sediment was then transferred to the sample containers in preparation for shipment to the lab.

As mentioned, composite samples were composed of sediment from adjacent DMMUs. For the most part, the pairing of cores involved adjacent DMMUs, but this was not always the case. Composite sample pairing is indicated in Table 2 (e.g., core POV-01 was composited with POV-02).

3.4 FIELD DOCUMENTATION

Field documentation included a field log, sediment core log sheets, a sample log sheet, cross-section worksheets, chain-of-custody forms, and digital photographs of each core. The field log was used to record general information, including sampling dates, sample depths, sample positions and other observations.

A sediment core log was maintained throughout the sampling event to record information pertaining to each core. The log includes station ID, core number, time, location coordinates, and depth to the mud line as measured using a weighted fiberglass tape measure and adjusted for the river stage at the time of sampling. Observations of core material in each core were also recorded at the time of core processing, including layer depths, color, sediment type, type and amount of any debris observed in the sample, and any anomalies worthy of note (e.g., odors, staining, etc). Sediment core log sheets are presented in Appendix B.

For reference, digital photographs were taken of the entire length of every sediment core; photographs are on file with Parametrix.

4. SAMPLE HANDLING PROCEDURES

Sample handling procedures were followed to ensure sample integrity between the time of collection and the time that laboratory analysis begins. These procedures included sample storage, chain-of-custody, and sample delivery.

4.1 SAMPLE STORAGE

All sediment samples were placed in sample jars, then the jars were placed on ice in a cooler until receipt by the analytical laboratory. Immediately prior to shipment to the lab, each cooler was taped shut and equipped with a signed custody seal. Upon sample receipt, the laboratories noted compliance with storage temperatures and custody procedures. No sample handling issues were noted as part of this project. Chemical analyses were done as soon as possible after sample collection; deviations from specified holding times are discussed in Section 5.3.

4.2 CHAIN-OF-CUSTODY PROCEDURES

Chain-of-custody procedures documented the transfer of all samples from the Field Operations Coordinator to the analytical laboratories. Triplicate chain-of-custody (COC) forms were used to record each sample container, sample collection dates and times, the project name, the number of sample containers, and prescribed analyses. Sample containers were delivered to the laboratory via courier or by Parametrix personnel (on the last day of each sampling week). The Field Operations Coordinator retained one copy of each COC form; copies of these are included in Appendix B.

5. LABORATORY ANALYTICAL METHODS

Laboratory analysis was conducted by Severn Trent Laboratories – Seattle (STL), and included physical and chemical analysis as specified in Section 2. In order to meet required analytical data turnaround times, a portion of the sediment samples for which grain size analyses were to be conducted was sub-contracted to Analytical Resources Incorporated (ARI), located in Tukwila, Washington.

Results of sample analysis are presented in Section 7.

5.1 CHEMICAL ANALYSIS

Sediment samples were analyzed as specified in Table 8-1 of the DMEF and as indicated in Table 1 of this report. As mentioned, archived material representing discrete core intervals and the NSM is currently archived at the lab.

5.2 PHYSICAL ANALYSIS

Grain size and other conventional sediment parameter analyses were conducted for each composite sample submitted to the lab (27 samples). Similarly, archived material representing discrete core intervals and the NSM is in storage at the lab.

5.3 LABORATORY CORRECTIVE ACTIONS

Corrective actions were required as part of sample analysis during this project and are discussed below. It should be noted, however, that none of the issues encountered resulted in the rejection of any of the data. Nonetheless, the issues are discussed separately below.

- 1) During preparation of samples for the analysis of interstitial tributyltin (TBT), laboratory personnel were unable to extract a supernatant from the sampling containers after centrifuging. This difficulty was attributed to the dense nature of the sediment (predominantly sand) and a lack of pore water. Hence, the lab was unable to do an analysis for interstitial TBT. As a result, it was decided that bulk sediment analysis of TBT would be an acceptable alternative. Subsequent conversation with regulatory personnel (USACE) confirmed that this approach was acceptable. In fact, for coarse-grained material, the bulk sediment analysis is actually preferred (as stated in the Interim Final Sediment Evaluation Framework, September 2006). However, the bulk sediment TBT analysis was not performed until after the holding time had expired. Nonetheless, the results are presented herein with the appropriate flag; none of the data were rejected.
- 2) Laboratory error during sample preparation and analysis of benzoic acid, a miscellaneous extractable reported as part of the 8270 method, resulted in method detection limits (MDL) that exceed the DMEF sediment quality screening level of 650 µg/kg. Data received from the lab typically provided a MDL for benzoic acid around 900 µg/kg. Although, none of the sample results actually indicated the detection of benzoic acid, re-analysis for benzoic acid at appropriate MDLs (<100 µg/kg) was conducted at a rate of 10 percent (3 samples); samples were selected from the archived discrete samples and were chosen based on their location within the dredge prism; one sample each was selected from the downstream, middle, and upstream portions of the dredge prism. Results of the follow-up analyses indicated benzoic acid concentrations of 89, 99 and 100 µg/kg, well

below the DMEF screening level. Laboratory data reports for the follow-up analyses are included in Appendix C.

- 3) Upon receipt of the final data packages, it was noted that the lab had failed to conduct total organic carbon (TOC) analysis for 3 of the 26 samples submitted (POV-2530, -2732, and -4344). However, given the highly homogenous nature of the sediments throughout the dredge prism and the low levels of TOC observed in samples analyzed (undetected in several samples), the existing weight of evidence compensates for this minor data gap.

6. QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

Quality assurance and quality control (QA/QC) procedures are discussed in detail in the analytical protocols for each chemical. The recommended frequency of specific quality control procedures and associated control limits are summarized in published sediment sampling and analysis guidance (PTI and McFarland 1995).

6.1 QA/QC FOR CHEMICAL ANALYSES

Quality control procedures for chemical analyses included analytical instrument calibration, sample holding times, blank analyses to identify potential sample contamination in the laboratory, duplicate analyses to test analytical precision, and analyses of spikes and standards to test analytical accuracy.

6.2 DATA QUALITY ASSURANCE REVIEW

In addition to the quality control reviews provided by STL, the Project QA Manager conducted a quality assurance review. Data were subjected to a QA1-type review, using the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for guidance. Data qualifiers were applied where necessary, based on the reviewer's judgment and experience. Data review for each analysis included evaluation of the following (where appropriate):

- Chain-of-custody documentation
- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample (LCS) recoveries;
- Matrix spike/spike duplicate (MS/MSD) recoveries; and
- Laboratory sample or spike replicate results and relative percent differences (RPDs).

The data packages submitted by STL and ARI were sufficient for this review. They included case narrative summaries of the work performed and any problems encountered during analysis, copies of the chain-of-custody forms, summary sample results, calibration data, raw analytical data, and summary QC results.

As determined by the review, samples tested by STL and ARI were analyzed within recommended technical holding times, with exceptions noted, and following appropriate methods and procedures. The bulk sediment TBT analysis was performed outside the recommended holding time, as were some of the total sulfides, TOC, and total volatile solids analyses. Nevertheless, the analytical accuracy and precision were generally acceptable, as demonstrated by the results of the laboratory QC analyses. Although some data were qualified due to out of control QC results, and organotin data was qualified due to holding time exceedances, no data were rejected based on this review. All data reported are considered valid, representative of the samples, and acceptable for further use. Data QA/QC summaries for each sample delivery group are included in Appendix C.

7. SEDIMENT DATA RESULTS

7.1 GENERAL PHYSICAL CHARACTERISTICS

Length of sediment samples (core recovery) ranged from 6.1 ft to 10.0 ft, with an average recovery of 8.1 ft. On average the sediment observed was composed of 95 percent sand (41 percent medium, 26 percent fine, 19 percent coarse), with fines comprising approximately 1 percent of the samples. The percentage of fines in a majority of samples was less than 1 percent. The average total organic carbon (TOC) was approximately 0.12 percent. Table 3 presents the grain size, TOC, and total solids data.

Visual observation of the sediment cores indicated that the sediment was highly homogenous. Typically, the only discernible change in sediment characteristics was a gradational change in the grain size of the sand. Of the 52 cores collected, silt (fines) was observed in only 4 cores, in isolated lenses approximating 4 to 6 inches in thickness.

7.2 ANALYSIS OF SEDIMENT CHEMISTRY DATA

Table 4 lists the dry weight chemical concentrations measured for all analytes. Data qualifiers attached to chemical concentrations are discussed in the “Checklist for Data Validation” memos included in Appendix A. Method detection limits are reported for undetected analytes, with the “U” symbol to indicate that the chemical was not detected. The following documents and their respective sediment quality criteria were used in assessing the sediment samples:

- *Dredged Material Evaluation Framework*, USACE 1998.
- Washington Department of Ecology, *Phase II Report: Development and Recommendations of SQVs for Freshwater Sediments in Washington State*, Table 3-3.
- National Oceanic and Atmospheric Administration *Screening Quick Reference Tables* (SQuaRT), Freshwater Threshold Effects Levels (updated September 1999).
- *Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems*. MacDonald D.D., C.G. Ingersoll CG, and T. Berger. 2000.

For reference, these various criteria are included in Table 4. For criteria that apply to the sum of individual compounds, isomers, or groups of congeners (if detected), the sums and their applicable criteria are reported as recommended in published sediment sampling and analysis guidance (PTI and McFarland 1995). The following observations were made in comparing sample results to the above criteria.

7.3 PROJECT-SPECIFIC RESULTS AND DISCUSSION

There were no exceedances of analyte criteria in any of the samples collected from the Port of Vancouver Gateway Expansion dredge prism.

Sediment sample core logs show that the sediment material to be dredged and the NSM consist primarily of fine to coarse sand (95 percent, on average) with an average total organic carbon content of 0.12 percent. Fines (silt) were observed in only 4 of the 52 sediment cores collected, and in small amounts (4-6 inch lenses).

8. REFERENCES

- Parametrix. 2005. Draft – Sediment Sampling and Analysis Plan, Port of Vancouver, Vessel Approach and Turning Basin Dredging Project. October 2005.
- MacDonald D.D., C.G. Ingersoll CG, and T. Berger. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. 2000.
- PTI and McFarland. 1995. Draft Sediment Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-204 WAC). Prepared by PTI Environmental Services. Revisions by B. McFarland. Washington Department of Ecology, Sediment Management Unit. Olympia, Washington. December 1995.
- USACE (U.S. Army Corps of Engineers). Dredged Material Evaluation Framework, Lower Columbia River Management Area. November 1998.
- USACE. Northwest Regional Sediment Evaluation Framework, Interim Final. September 2006.
- Washington Department of Ecology, Phase II Report: Development and Recommendations of SQVs for Freshwater Sediments in Washington State, September 2003.

FIGURES



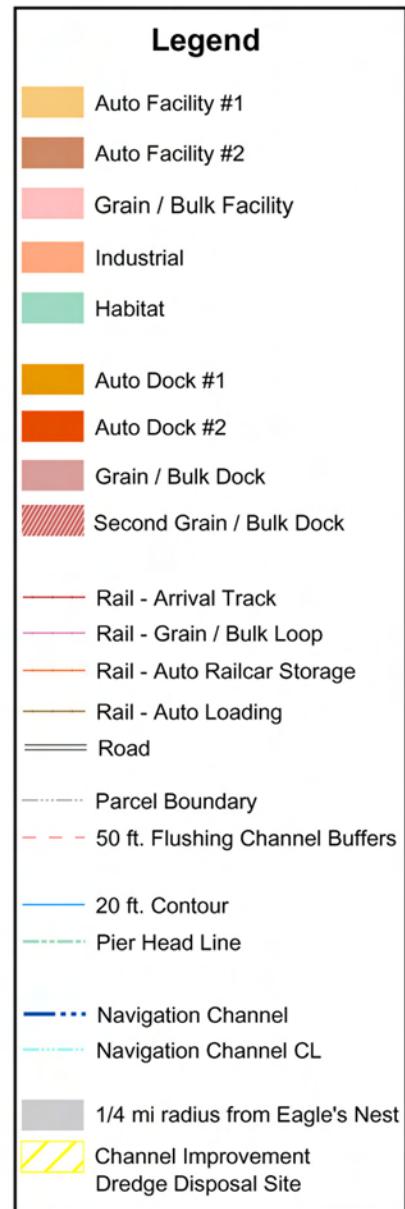
Parametrix Port of Vancouver 553-4523-802/01(01) 8/05 (B)

Figure 1-1
Port of Vancouver
Vessel Approach and Turning Basin



Columbia Gateway

Preferred Alternative Parcel 3 Detail Plan



All information is subject to survey verification

Produced December 10, 2003

Prepared for: Port of Vancouver

Prepared by: PB Ports & Marine

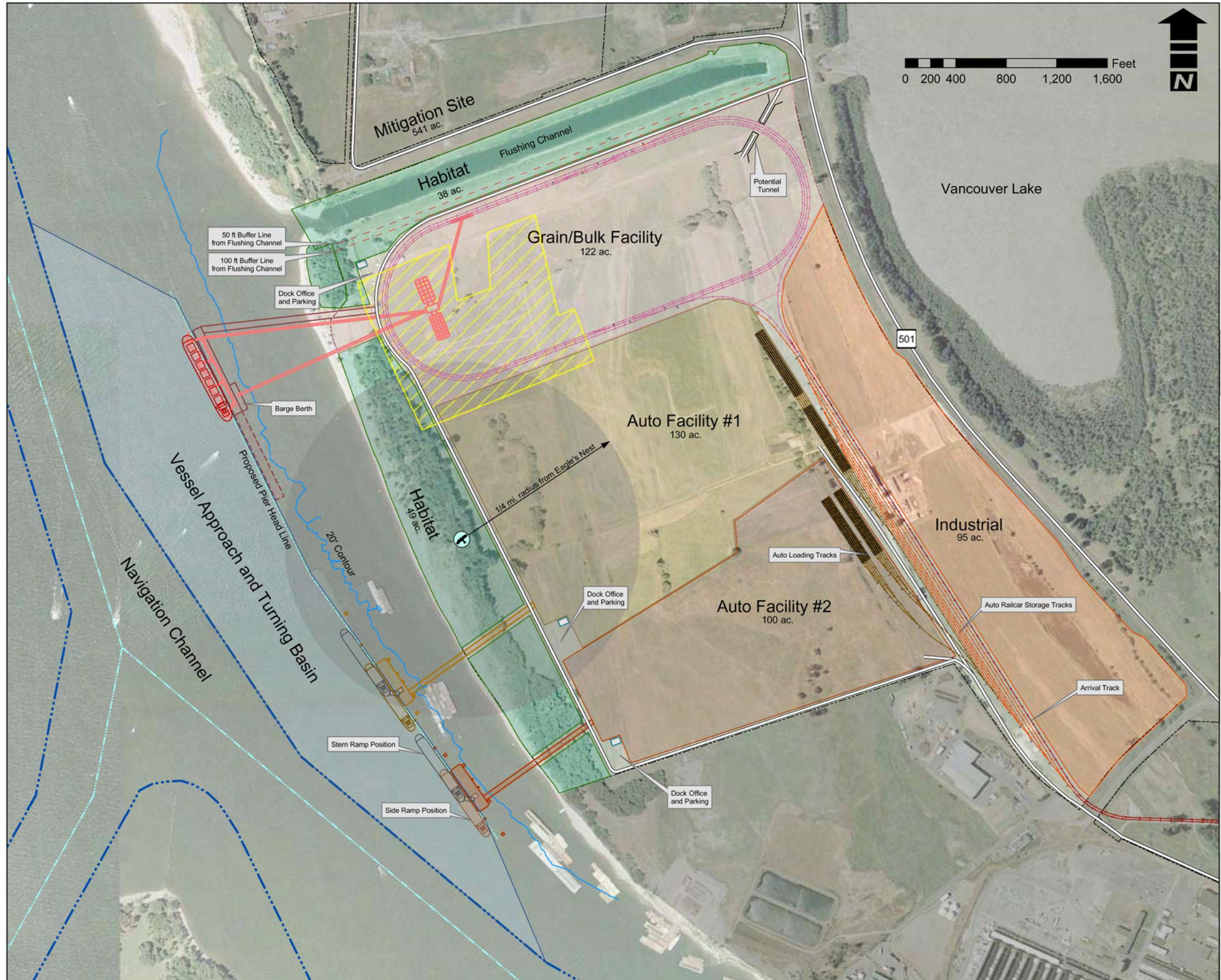
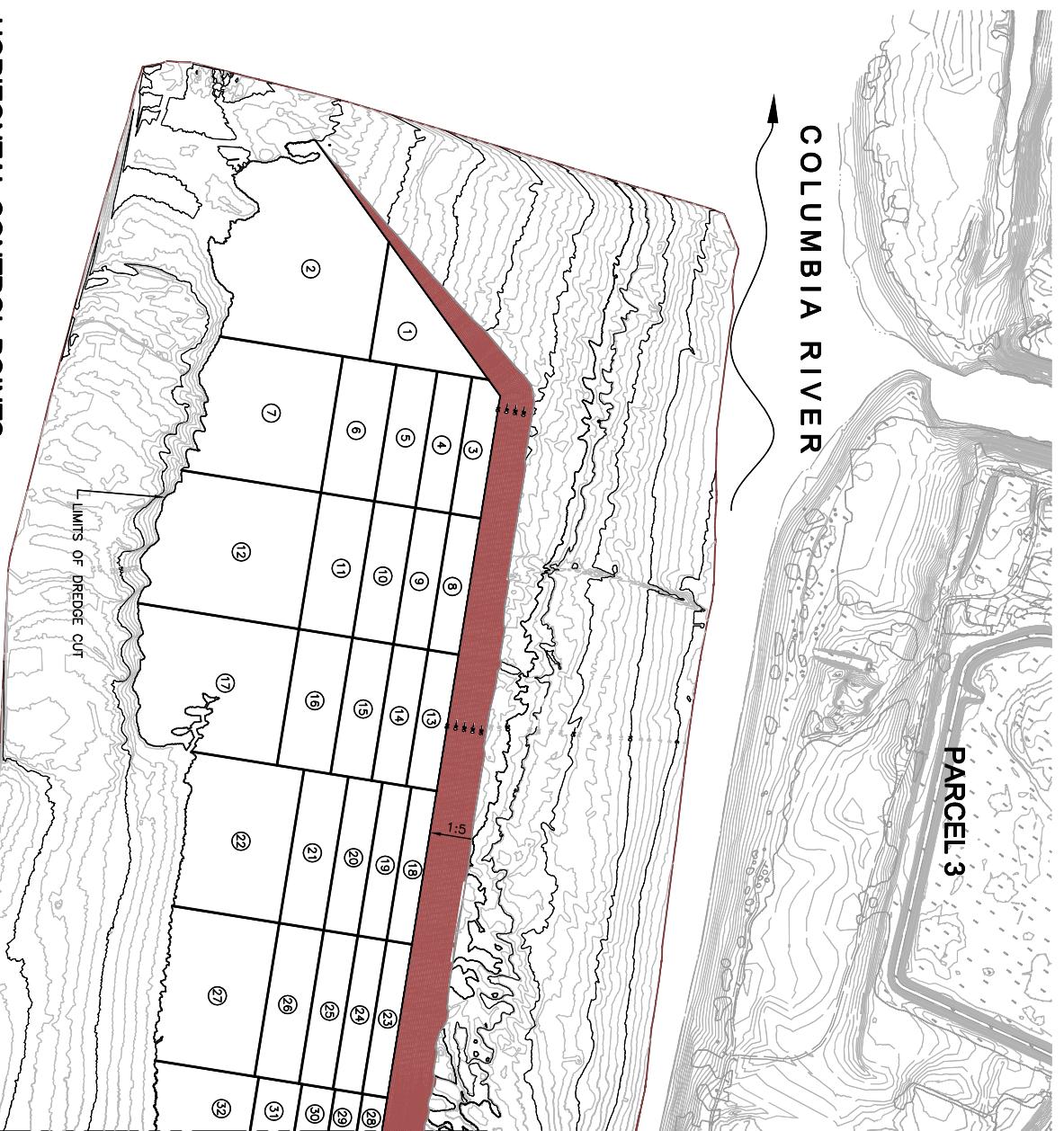


Figure 1-2
Port of Vancouver
Columbia Gateway Detail Plan

COLUMBIA RIVER

PARCE 3



MATCH LINE SEE FIGURE 1-3B



VANCOUVER
U.S.A.

PORT OF VANCOUVER
COLUMBIA GATEWAY
CONCEPTUAL PARCEL 3
DREDGE SAMPLING PLAN

3103 N.W. LOWER RIVER ROAD
VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

NOTE

1. DREDGED MATERIAL MANAGEMENT UNITS (DMMU) EXTEND TO A DEPTH OF 48 FEET BELOW COLUMBIA RIVER DATUM (CRD).
 2. ALL DMMU HAVE APPROXIMATE EQUAL VOLUME.

HORIZONTAL DATUM : WASHINGTON STATE PLANE SOUTH
VERTICAL DATUM: COLUMBIA RIVER DATUM

HORIZONTAL DATUM SURVEY CONSTRUCTION

SURVEY CONTROL:

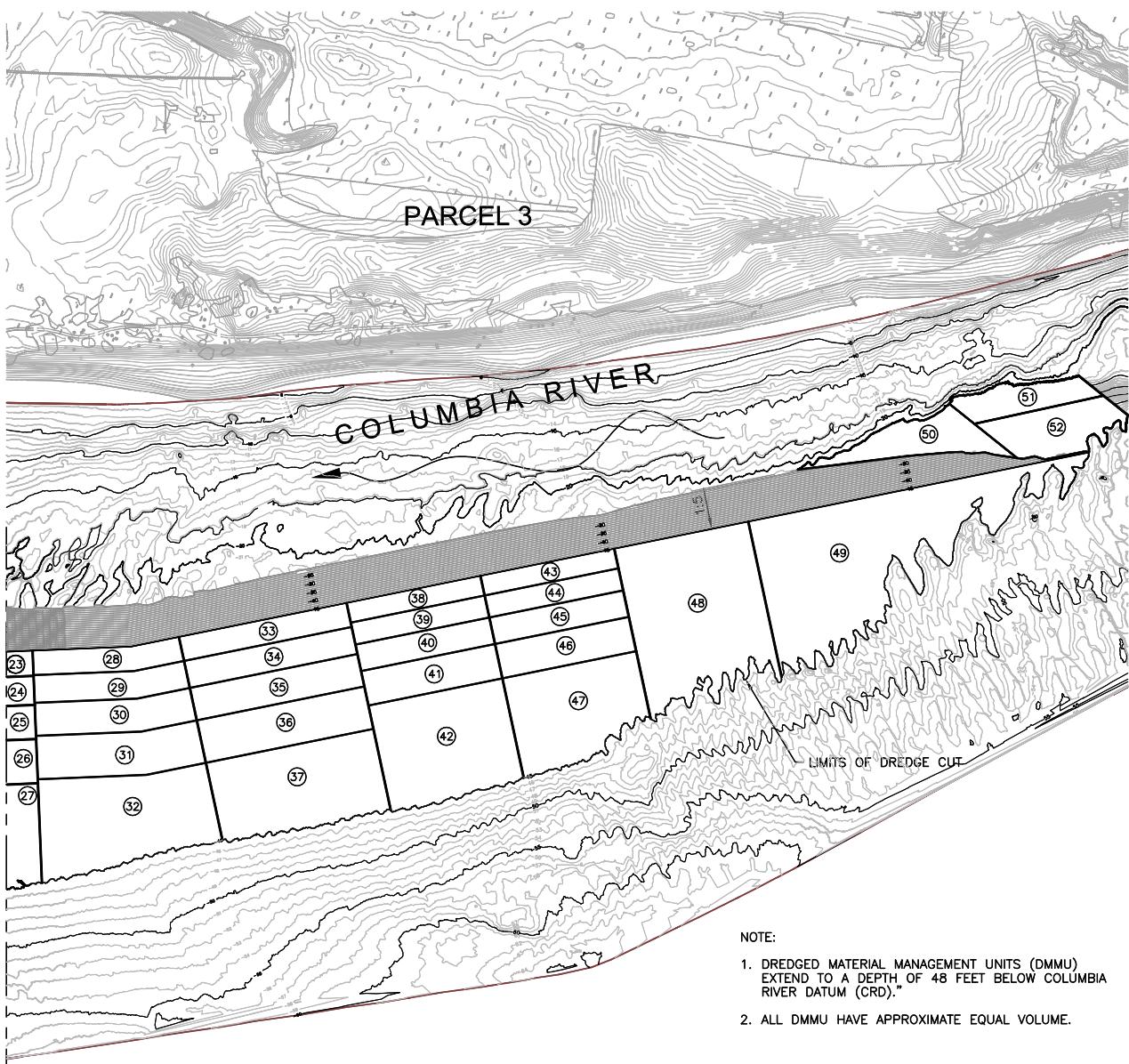
A horizontal scale bar representing distance. It features a vertical scale line with numerical markings at 0, 250, and 500. The word "feet" is written vertically below the scale line. Two thick black arrows point away from the scale line, indicating the direction of measurement.

NUM	NAME	NAME	NAME
(1)	N 128645.11	E 1061600.15	(10) N 128025.08
(2)	N 128630.93	E 1061267.56	(11) N 128630.93
(3)	N 128473.68	E 1061953.89	(12) N 127545.64
(4)	N 128433.24	E 1061871.46	(13) N 127769.22
(5)	N 128389.60	E 1061774.03	(14) N 127722.45
(6)	N 128324.96	E 1061645.23	(15) N 127678.08
(7)	N 128223.84	E 1061415.43	(16) N 127617.01
(8)	N 128116.82	E 1062133.68	(17) N 127508.54
(9)	N 128073.69	E 1062047.07	(18) N 127380.90

UNI	NAME	UNI
(19)	N 127345.68	E 1062441.47
(20)	N 127310.37	E 1062354.31
(21)	N 127253.21	E 1062248.76
(22)	N 127161.13	E 1062060.37
(23)	N 126986.08	E 1062704.65
(24)	N 126949.29	E 1062631.91
(25)	N 126907.65	E 1062554.38
(26)	N 126853.02	E 1062444.37
(27)	N 126756.13	E 1062263.31

 <p>PORT OF VANCOUVER U.S.A.</p> <p>3103 N.W. LOWER RIVER ROAD VANCOUVER, WA 98660-1027 (360) 693-3611 FAX (360) 735-1565</p>	<h1>PORT OF VANCOUVER</h1> <h2>COLUMBIA GATEWAY</h2> <h3>CONCEPTUAL PARCEL 3</h3> <h3>DREDGE SAMPLING PLAN</h3>	<p>DRAWING SCALE: AS SHOWN</p> <p>DRAWN BY: CBD</p> <p>APPROVED BY: DATE: 14-AUG-06</p> <p>REVISIONS NO. _____ NO. _____ NO. _____ NO. _____</p>	 <p>700 NE MULTNOMAH ST, SUITE 900 PORTLAND, OREGON 97232-4189 VOICE: (503)731-6041 FAX: (503)731-8902</p> <p>A/E PROJECT NUMBER: PAPOR-05-099</p>
FIG1-3A	DRAWING NUMBER <hr/> SHEET CONTENTS: 3D FIGURE <hr/> <hr/>		
SHEET NUMBER 1 OF 2 POY PROJECT NO: <hr/>			

MATCH LINE SEE FIGURE 1-3A



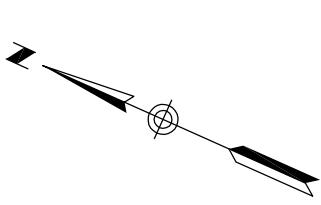
HORIZONTAL CONTROL POINTS (REVISED)

UNIT	NORTHING	EASTING
(28)	N 126575.09	E 1062906.91
(29)	N 126528.35	E 1062837.41
(30)	N 126490.60	E 1062766.38
(31)	N 126428.90	E 1062665.17
(32)	N 126346.87	E 1062536.54
(33)	N 126190.94	E 1063166.42
(34)	N 126146.07	E 1063104.44
(35)	N 126096.42	E 1063028.86
(36)	N 126036.64	E 1062942.76
(37)	N 125941.55	E 1062810.40
(38)	N 125829.26	E 1063431.24
(39)	N 125791.34	E 1063380.41
(40)	N 125750.94	E 1063324.04

UNIT	NORTHING	EASTING
(41)	N 125693.28	E 1063250.42
(42)	N 125581.37	E 1063101.68
(43)	N 125506.23	E 1063659.23
(44)	N 125469.67	E 1063608.54
(45)	N 125427.66	E 1063550.72
(46)	N 125377.56	E 1063479.72
(47)	N 125278.56	E 1063347.21
(48)	N 125075.22	E 1063749.70
(49)	N 124754.36	E 1064051.81
(50)	N 124656.11	E 1064475.11
(51)	N 124435.42	E 1064691.83
(52)	N 124322.60	E 1064645.57

SURVEY CONTROL:

HORIZONTAL DATUM : WASHINGTON STATE PLANE SOUTH
VERTICAL DATUM: COLUMBIA RIVER DATUM



250 0 250 500
scale feet

PORT OF VANCOUVER
COLUMBIA GATEWAY
CONCEPTUAL PARCEL 3
DREDGE SAMPLING PLAN



3103 N.W. LOWER RIVER ROAD
VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

SHEET CONTENTS:
SAP FIGURE
REV. HORIZONTAL
CONTROL POINTS

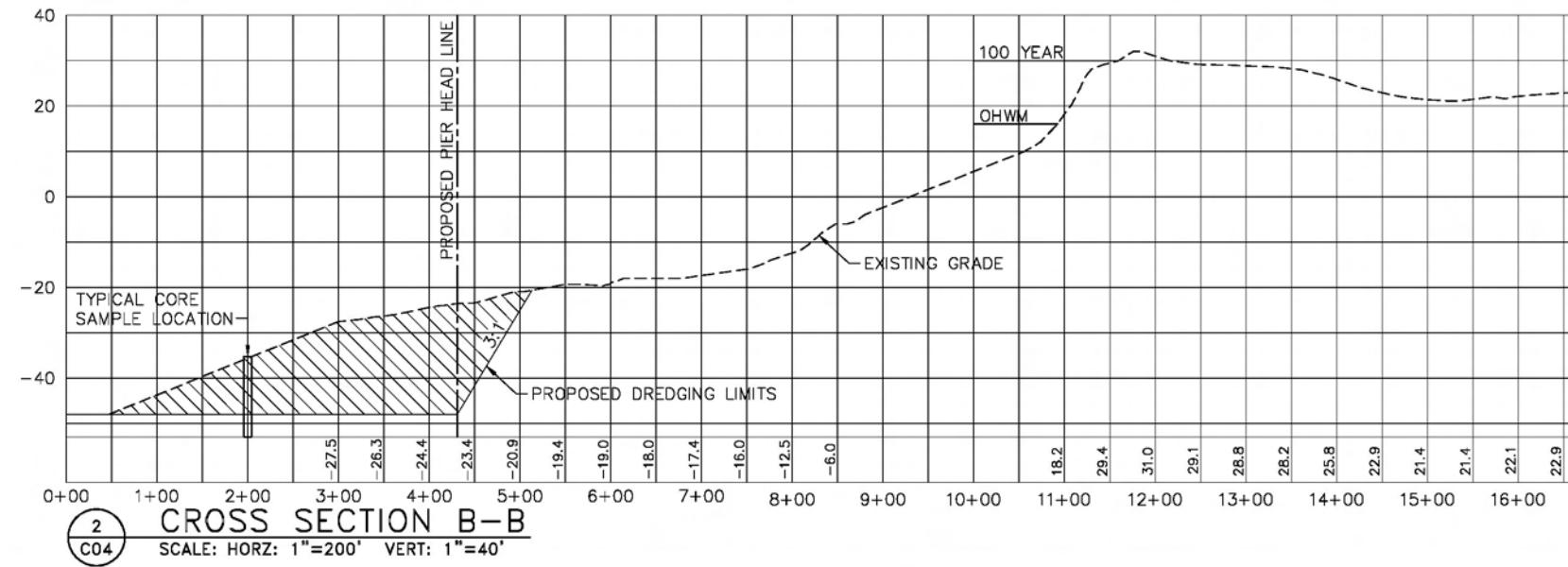
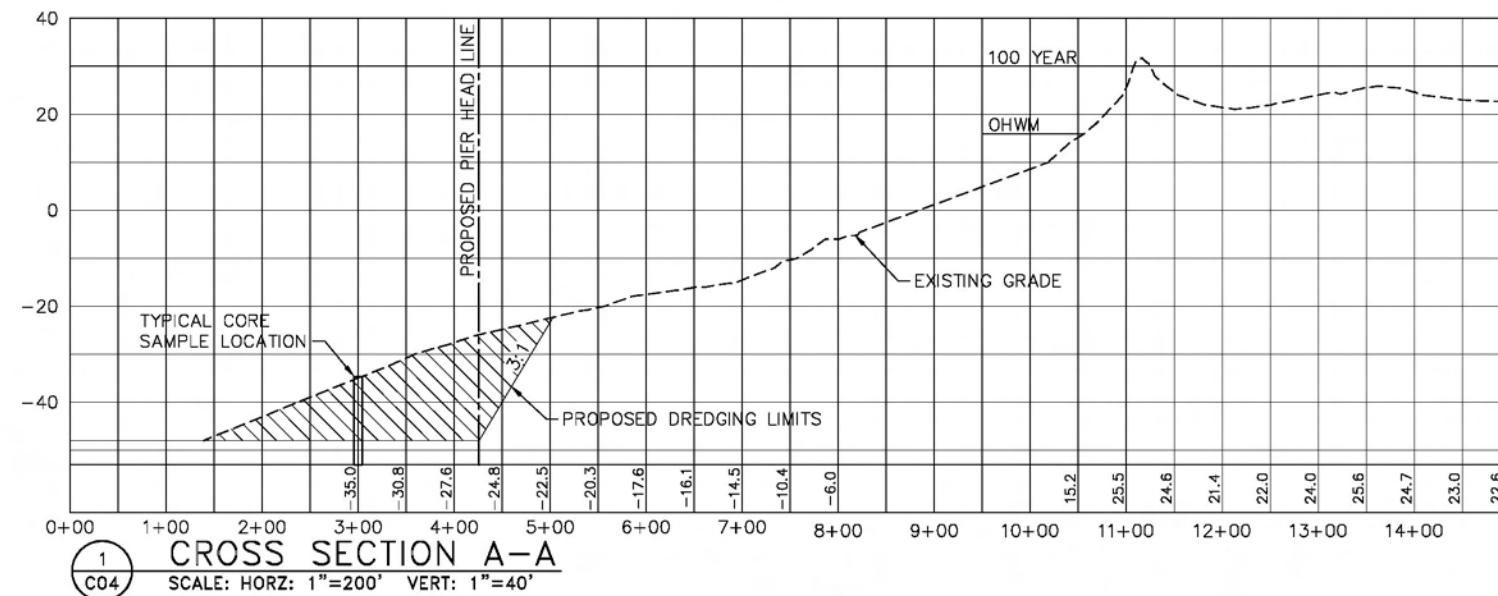
DRAWING NUMBER

FIG1-3B

SHEET NUMBER 2 OF 2
POV PROJECT NO:

700 NE MULINOWAH ST SUITE 900
PORTLAND, OREGON
97232-4180
VOICE: (503) 733-4601
FAX: (503) 731-6802

A/E PROJECT NUMBER: PAPOR-05-099

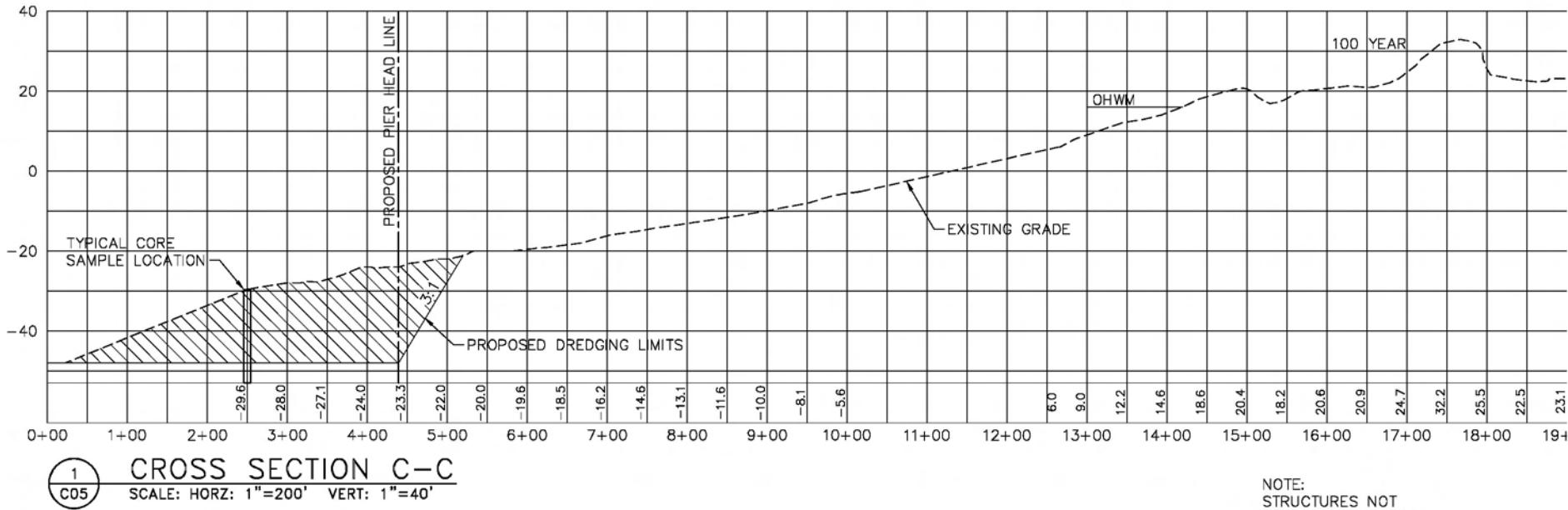


830 NE HOLLADAY ST, SUITE 140
PORTLAND, OREGON
97232-2107
ENGINEERS IN C. VOICE: (503)731-6041
FAX: (503)731-8902

PORT OF VANCOUVER - COLUMBIA GATEWAY NEPA SUPPORT

FIGURE 1-4
AUTO DOCK DREDGING SECTIONS AND TYPICAL CORE SAMPLE LOCATION

DRAWN BY: T. NGUYEN
DESIGNED BY: M. EDBERG
CHECKED BY: M. EDBERG
DATE: 09/02/2005
SHEET: 4 OF 5

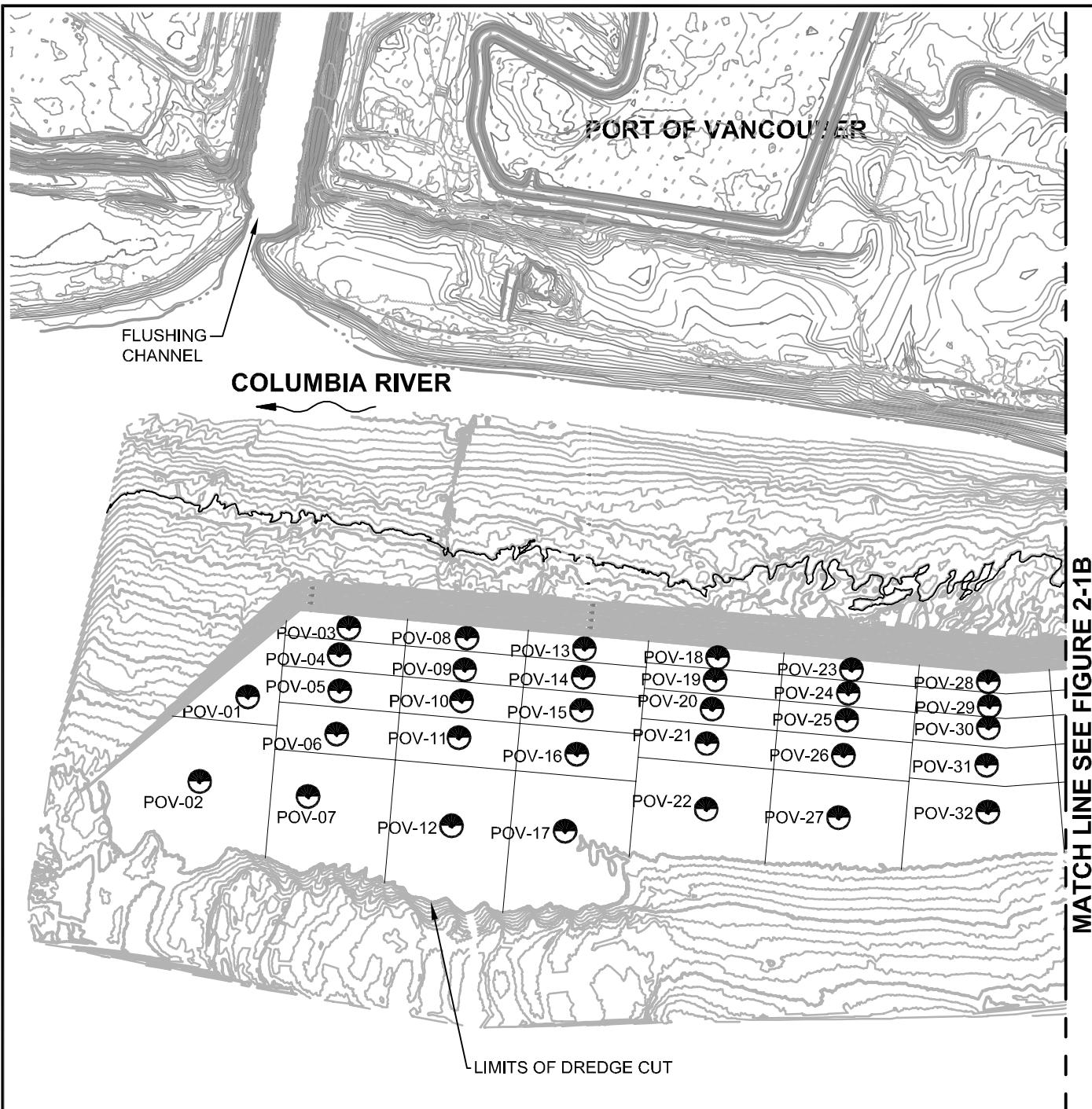


830 NE HOLLADAY ST, SUITE 140
PORTLAND, OREGON
97232-2107

PORT OF VANCOUVER - COLUMBIA GATEWAY NEPA SUPPORT

FIGURE 1-5
AUTO DOCK DREDGING SECTION AND TYPICAL CORE SAMPLE LOCATION

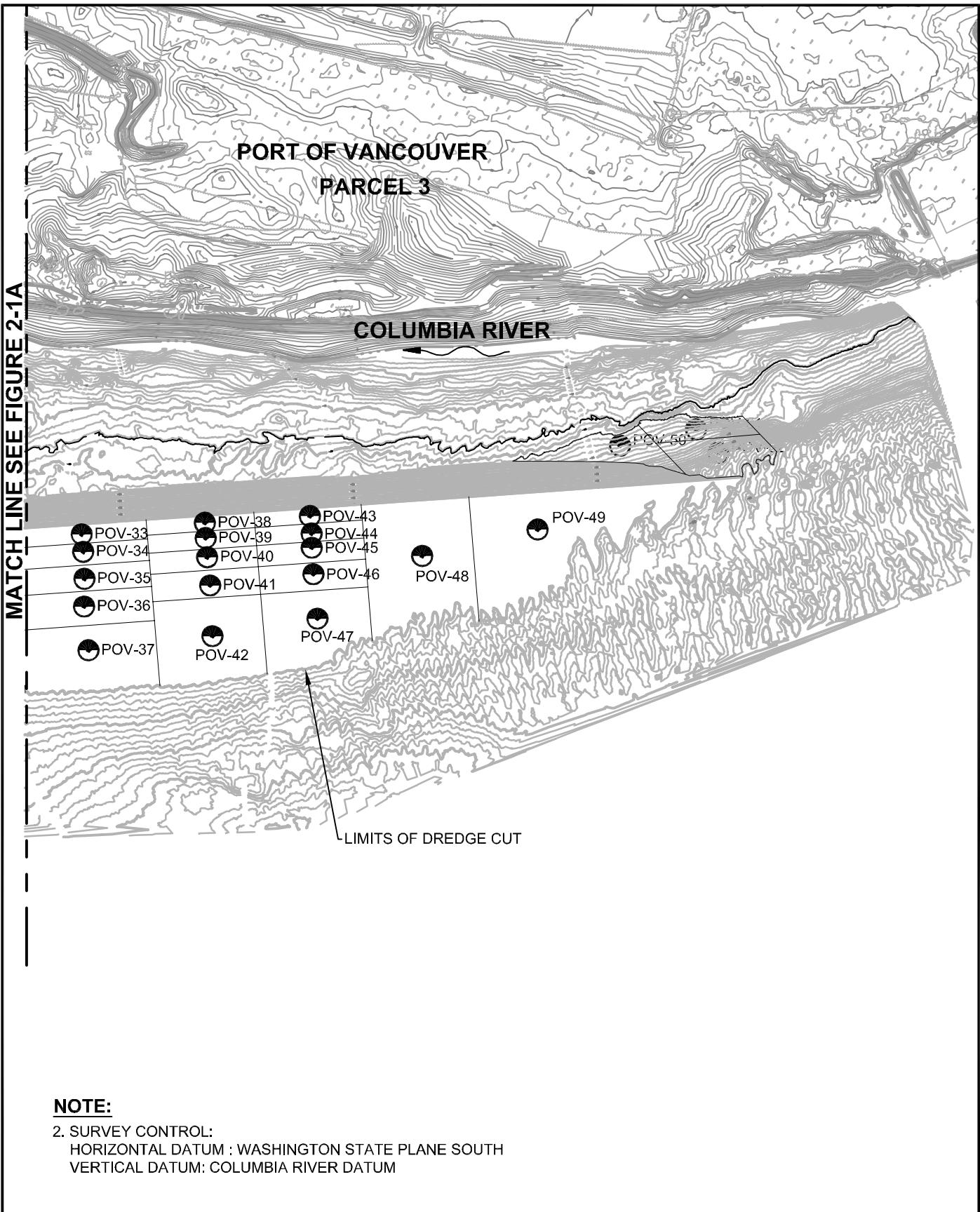
DRAWN BY: T. NGUYEN
DESIGNED BY: M. EDBERG
CHECKED BY: M. EDBERG
DATE: 09/02/2005
SHEET: 5 OF 5



NOTES:

2.SURVEY CONTROL:
HORIZONTAL DATUM : WASHINGTON STATE PLANE SOUTH
VERTICAL DATUM: COLUMBIA RIVER DATUM

Figure 2-1A
Actual Sediment Sampling Locations
Port of Vancouver-Gateway Expansion
Vessel Approach and Turning Basin Project



Parametrix DATE: Jan 18, 2007 FILE: PO4523003P01F-03

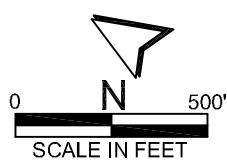


Figure 2-1B
Actual Sediment Sampling Locations
Port of Vancouver-Gateway Expansion
Vessel Approach and Turning Basin Project

TABLES

Table 1
Port of Vancouver
Sediment Analytes

Conventional Parameters	Metals (mg/kg)
Ammonia (mg/kg)	Antimony
Total Solids (%)	Arsenic
Total Volatile Solids (%)	Cadmium
Total Organic Carbon (%)	Chromium
Total Sulfides (mg/kg)	Copper
Grain Size	Lead
Polynuclear Aromatic Hydrocarbons (ug/kg)	
2-Methylnaphthalene	Mercury (ug/kg)
Acenaphthene	Nickel
Acenaphthylene	Silver
Anthracene	Zinc
Fluorene	
Naphthalene	
Phenanthrene	
Total LPAH	
Benzo[a]anthracene	
Benzo[a]pyrene	
Benzo[g,h,i]perylene	
Benzofluoranthene	
Chrysene	
Dibenzo(a,h)anthracene	
Fluoranthene	
Indeno[1,2,3-cd]pyrene	
Pyrene	
Total HPAH	
Chlorinated Hydrocarbons (ug/kg)	
1,2,4-Trichlorobenzene	4,4'-DDD
1,2-Dichlorobenzene	4,4'-DDE
1,3-Dichlorobenzene	4,4'-DDT
1,4-Dichlorobenzene	Total DDT
Hexachlorobenzene	Aldrin
Phthalates (ug/kg)	
Bis(2-ethylhexyl) phthalate	alpha-Chlordane
Butyl benzyl phthalate	Dieldrin
Diethyl phthalate	gamma-BHC (Lindane)
Dimethyl phthalate	Heptachlor
Di-n-butyl phthalate	
Di-n-octyl phthalate	
Phenols (ug/kg)	
2,4-Dimethylphenol	Polychlorinated biphenyls (mg/kg)
2-Methylphenol	PCB-1016
3 & 4 Methylphenol	PCB-1221
Pentachlorophenol	PCB-1232
Phenol	PCB-1242
	PCB-1248
	PCB-1254
	PCB-1260
	Total PCBs

Notes: List of compounds taken from Table 8-1 of the Dredged Material Evaluation Framework

Table 2
Sediment Sampling Locations

Station ID	Latitude	Longitude	Mudline Elevation (CRD)	Core Recovery (ft)	Depth of Penetration (CRD)	Composite Pair	NSM Encountered?
POV-01	45.66332	-122.76407	-37.31	8.4	-45.71	POV-02	
POV-02	45.66327	-122.76533	-46.34	8.8	-55.14	POV-01	yes
POV-03	45.66289	-122.76261	-29.52	7.4	-36.92	POV-08	
POV-04	45.66283	-122.76297	-34.07	7.5	-41.57	POV-09	
POV-05	45.66265	-122.76336	-38.19	8.4	-46.59	POV-10	
POV-06	45.66246	-122.76385	-40.03	7.7	-47.73	POV-11	
POV-07	45.66237	-122.76473	-44.87	8.4	-53.27	POV-12	yes
POV-08	45.66194	-122.76189	-29.36	7.5	-36.86	POV-03	
POV-09	45.66180	-122.76225	-35.98	8.2	-44.18	POV-04	
POV-10	45.66167	-122.76261	-34.8	7.5	-42.3	POV-05	
POV-11	45.66151	-122.76303	-34.21	7.9	-42.11	POV-06	
POV-12	45.66113	-122.76404	-47.37	6.1	-53.47	POV-07	yes
POV-13	45.66099	-122.76118	-31.1	9.1	-40.2	POV-18	
POV-14	45.66086	-122.76150	-32.9	8.8	-41.7	POV-19	
POV-15	45.66071	-122.76187	-34.38	9.4	-43.78	POV-20	
POV-16	45.66053	-122.76238	-38.52	6.9	-45.42	POV-21	
POV-17	45.66024	-122.76330	-45.98	6.6	-52.58	POV-22	yes
POV-18	45.65993	-122.76034	-28.23	7.9	-36.13	POV-13	
POV-19	45.65984	-122.76060	-31.17	7.5	-38.67	POV-14	
POV-20	45.65972	-122.76094	-33.31	7.3	-40.61	POV-15	
POV-21	45.65959	-122.76135	-37	7.4	-44.4	POV-16	
POV-22	45.65927	-122.76207	-43.01	8.7	-51.71	POV-17	yes
POV-23	45.65885	-122.75953	-25.95	8.6	-34.55	POV-28	
POV-24	45.65876	-122.75981	-28.91	7.4	-36.31	POV-29	
POV-25	45.65864	-122.76011	-30.48	8.2	-38.68	POV-30	
POV-26	45.65849	-122.76052	-36.25	8.2	-44.45	POV-31	
POV-27	45.65822	-122.76123	-42.68	8	-50.68	POV-32	yes
POV-28	45.65775	-122.75870	-26.42	7.4	-33.82	POV-23	
POV-29	45.65762	-122.75896	-29.35	7.4	-36.75	POV-24	
POV-30	45.65752	-122.75920	-33.21	8.1	-41.31	POV-25	
POV-31	45.65735	-122.75962	-36.05	8.6	-44.65	POV-26	
POV-32	45.65711	-122.76012	-41.27	7.7	-48.97	POV-27	yes
POV-33	45.65672	-122.75765	-26.62	8.6	-35.22	POV-38	
POV-34	45.65661	-122.75785	-27.57	8.2	-35.77	POV-39	
POV-35	45.65645	-122.75817	-31.54	7.3	-38.84	POV-40	
POV-36	45.65630	-122.75851	-34.88	8.6	-43.48	POV-41	
POV-37	45.65602	-122.75901	-39.36	10	-49.36	POV-42	yes
POV-38	45.65573	-122.75654	-27.18	9.1	-36.28	POV-33	
POV-39	45.65564	-122.75672	-28.35	6.5	-34.85	POV-34	
POV-40	45.65552	-122.75694	-31.09	7.3	-38.39	POV-35	
POV-41	45.65534	-122.75726	-34.34	9.1	-43.44	POV-36	
POV-42	45.65504	-122.75786	-39.78	8.9	-48.68	POV-37	yes
POV-43	45.65487	-122.75563	-28.77	8.9	-37.67	POV-44	
POV-44	45.65476	-122.75583	-29.99	6.8	-36.79	POV-43	
POV-45	45.65468	-122.75600	-30.85	8.3	-39.15	POV-46	
POV-46	45.65452	-122.75631	-34.72	9	-43.72	POV-45	
POV-47	45.65424	-122.75682	-41.01	8.9	-49.91	POV-48	yes
POV-48	45.65369	-122.75523	-36.85	8.8	-45.65	POV-47	

Table 2
Sediment Sampling Locations

POV-49	45.65285	-122.75400	-40.4	8	-48.4	POV-52	yes
POV-50	45.65261	-122.75233	-29.07	8	-37.07	POV-51	
POV-51	45.65205	-122.75153	-26.82	8	-34.82	POV-50	
POV-52	45.65173	-122.75164	-38.54	7.6	-46.14	POV-49	

Table 3
Port of Vancouver
Grain Size, Total Organic Carbon, and Total Solids

Sample			Grain Size (percent retained)												
			Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Total Sand (% of solids)	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay	Total Fines
	% Total Solids	% TOC	#10	#18	#35	#60	#120	#230	-	(62.5 - 31)	(31 - 15.6)	(15.6 - 7.8)	(7.8 - 3.9)	(3.9 - 1.0)	<230
POV-0102	87.0	.0502 U	1.6	2.6	13.7	24.3	54.8	0.8	96.2	2.1	NA	NA	0.1	0.8	3.0
POV-0308	86.9	.0503 U	2.6	2.7	15.5	20.7	54.3	3.3	96.5	NA	NA	0.6	NA	0.1	0.7
POV-0409	82.3	0.097 J	4.3	12.9	24.1	37.3	19.2	1.7	95.2	NA	NA	NA	NA	NA	0.6
POV-0510	93.4	0.067 J	4.0	7.0	15.7	49.4	21.7	1.3	95.1	NA	NA	NA	NA	NA	0.9
POV-0611	85.9	.0503 U	1.8	3.6	16.0	28.4	46.8	1.8	96.6	1.6	0.5	NA	0.1	1.2	3.4
POV-0712	82.5	.0502 U	0.8	8.7	29.7	41.3	15.1	2.1	96.9	NA	NA	NA	NA	NA	1.0
POV-1318	79.6	0.344 J	4.1	11.1	21.9	40.9	19.6	1.9	95.4	NA	NA	NA	NA	NA	0.6
POV-1419	80.4	0.066 J	4.0	12.6	22.1	38.2	20.4	1.7	95.0	NA	NA	NA	NA	NA	0.9
POV-1520	80.8	0.055 J	2.5	9.1	23.1	44.7	18.6	1.3	96.8	NA	NA	NA	NA	NA	0.7
POV-1621	74.9	0.094 J	4.1	9.6	19.7	47.1	17.3	1.2	94.9	NA	NA	NA	NA	NA	0.9
POV-1722	79.9	.0503 U	0.6	2.0	13.7	21.8	60.3	0.6	98.4	NA	NA	NA	NA	NA	1.5
POV-2328	73.1	0.158 J	3.9	7.2	16.9	47.7	22.5	1.4	95.7	NA	NA	NA	NA	NA	0.5
POV-2429	78.4	0.142 J	2.9	7.9	17.5	48.3	20.1	1.8	95.6	NA	NA	NA	NA	NA	1.4
POV-2530	74.3	nm	2.4	9.0	23.0	44.6	18.5	1.2	96.5	NA	NA	NA	NA	NA	1.1
POV-2631	92.5	0.050 J	3.9	8.0	16.6	46.8	23.0	1.5	95.9	NA	NA	NA	NA	NA	0.4
POV-2732	79.2	nm	4.1	8.2	16.8	47.0	22.2	1.7	95.9	NA	NA	NA	NA	NA	0.8
POV-3338	87.5	0.208 J	1.7	5.1	13.2	49.2	28.7	1.9	98.1	NA	NA	NA	NA	NA	0.2
POV-3439	79.8	0.179 J	5.8	10.6	18.5	44.2	18.9	1.2	93.4	NA	NA	NA	NA	NA	0.9
POV-3540	83.2	0.084 J	7.1	10.3	16.0	45.9	18.6	1.3	92.1	NA	NA	NA	NA	NA	0.8
POV-3641	89.6	0.126 J	5.0	8.4	14.2	45.5	25.0	1.5	94.6	NA	NA	NA	NA	NA	0.4
POV-3742	82.8	.0502 U	3.9	3.5	14.3	19.2	56.7	0.9	94.6	NA	NA	NA	NA	NA	2.4
POV-4344	80.7	nm	4.0	10.1	21.6	41.7	18.7	2.0	94.1	NA	NA	NA	NA	NA	1.6
POV-4546	83.6	0.111 J	4.1	9.2	18.0	46.7	20.0	1.1	95.0	NA	NA	NA	NA	NA	0.9
POV-4748	81.2	0.0504 U	2.4	5.1	11.4	46.8	28.0	3.7	95.0	NA	NA	NA	NA	NA	1.7
POV-4952	77.2	0.061 J	2.3	6.0	16.4	49.1	24.2	1.6	97.3	NA	NA	NA	NA	NA	0.5
POV-5051	78.2	0.091 J	7.7	13.2	26.8	38.3	12.4	0.8	91.5	NA	NA	NA	NA	NA	0.7
Averages		81.9	0.121	3.6	8.0	18.5	41.2	26.0	1.6	95.4	NA	NA	NA	NA	1.0

Notes: nm = not measured

Table 4
Port of Vancouver
Analytical Data

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results										
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-0102	POV-0308	POV-0409	POV-0510	POV-0611	POV-0712	POV-1318	POV-1419					
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/13/06	10/12/06	10/12/06	10/12/06	10/13/06	10/13/06	10/18/06	10/18/06				
Phthalates (ug/kg)																					
Bis(2-ethylhexyl) phthalate	47	8,300	--	--	--	2520	6380	--	270	U	260	U	270	U	260	U	300	U	290	U	
Butyl benzyl phthalate	4.9	970	--	--	--	260	366	--	33	U	31	U	32	U	33	U	31	U	36	U	
Diethyl phthalate	61	1,200	--	--	--	--	--	--	8.1	UJ	7.7	U	8	U	8.1	U	7.7	UJ	8.9	UJ	
Dimethyl phthalate	53	1,400	--	--	--	311	436	--	8.7	U	8.2	U	8.6	U	8.6	U	8.2	U	9.5	U	
Di-n-butyl phthalate	220	5,100	--	--	200,000	--	103	--	--	15	U	37	JB M	14	U	15	U	14	U	16	U
Di-n-octyl phthalate	58	6,200	--	--	--	11	201	--	37	U	35	U	37	U	37	U	35	U	41	U	
Phenols (ug/kg)																					
2,4-Dimethylphenol	29	29	210	--	--	--	--	--	21	U	20	U	21	U	21	U	20	U	23	U	
2-Methylphenol	63	63	77	--	--	--	--	--	32	U	30	U	31	U	31	U	30	U	35	U	
3 & 4 Methylphenol	670	670	3,600	--	--	760	2360	--	60	U	56	U	59	U	59	U	56	U	65	U	
Pentachlorophenol	360	400	690	--	11,000	--	--	--	35	U	33	U	34	U	35	U	33	U	38	U	
Phenol	420	420	1,200	--	--	--	--	--	30	U	29	U	30	U	30	U	29	U	33	U	
Miscellaneous Extractables (ug/kg)																					
Benzoic acid	650	650	760	--	--	--	2910	3790	--	940	U	880	U	920	U	930	U	880	U	1000	U
Benzyl alcohol	57	57	870	--	--	--	--	--	34	U	32	U	33	U	34	U	32	U	37	U	
Dibenzofuran	15	540	1,700	--	--	--	399	443	--	19	U	18	U	19	U	19	U	18	U	21	U
Hexachlorobutadiene	3.9	29	270	--	--	--	--	--	0.11	U	0.12	U	0.12	U	0.13	U	0.12	U	0.13	UJ	
N-Nitrosodiphenylamine	11	28	130	--	--	--	--	--	17	UJ	16	U	17	U	17	U	16	UJ	19	UJ	
Pesticides (ug/kg)																					
4,4'-DDD	--	--	--	--	--	3.54	96	--	28.0	0.28	U	0.29	U	0.29	U	0.31	U	0.29	U	0.33	U
4,4'-DDE	--	--	--	--	--	1.42	21	--	31.3	0.24	U	0.24	U	0.25	U	0.27	U	0.24	U	0.28	U
4,4'-DDT	--	--	--	--	--	--	19	--	62.9	0.28	U	0.28	U	0.29	U	0.31	U	0.28	U	0.33	U
Total DDT	--	6.9	69	4,000	1,000	6.98	--	--	572												
Aldrin	--	10	--	--	170	--	--	--	0.11	U	0.12	U	0.12	U	0.13	U	0.12	U	0.13	U	
alpha-Chlordane	--	10	--	--	1,000	4.5	--	--	17.6	0.13	U	0.13	U	0.13	U	0.14	U	0.13	U	0.15	U
Dieldrin	--	10	--	--	170	2.85	--	--	61.8	0.23	U	0.24	U	0.24	U	0.26	U	0.24	U	0.28	U
gamma-BHC (Lindane)	--	10	--	10	--	0.94	--	--	4.99	0.12	U	0.13	U	0.13	U	0.14	U	0.13	U	0.15	U
Heptachlor	--	10	--	--	--	0.6	--	--	16.0	0.14	U	0.14	U	0.15	U	0.16	U	0.14	U	0.17	U
Polychlorinated biphenyls (mg/kg)																					
PCB-1016	--	--	--	--	--	--	--	--	0.0066	UJ	0.0065	U	0.0066	U	0.0067	U	0.0061	UJ	0.007	UJ	
PCB-1221	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0066	U	0.0067	U	0.0061	U	0.007	U	
PCB-1232	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0066	U	0.0067	U	0.0061	U	0.007	U	
PCB-1242	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0066	U	0.0067	U	0.0061	U	0.007	U	
PCB-1248	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0066	U	0.0067	U	0.0061	U	0.007	U	
PCB-1254	--	--	--	--	--	230	294	--	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0016	U	0.0018	U	
PCB-1260	--	--	--	--	--	138	140	--	0.0017	UJ	0.0017	U	0.0017	U	0.0017	U	0.0016	UJ	0.0018	UJ	
Total PCBs	12	0.13	3.1	10.0	2.0	0.0341	62	354	676												

Notes:

-- Indicates no numerical criterion of this type for this chemical. nm = not measured

¹Sediment Management Standard (WAC 173-204)

²NOAA SQuIRT - NOAA Screening Quick Reference Tables, developed by the Coastal Protection & Restoration Division of NOAA

³MacDonald - Values obtained from *Prediction of sediment toxicity using consensus-based freshwater sediment quality guidelines*, EPA 905/R-00/007. June 2000

⁴Total organic carbon (TOC) analyzed via two different methods: STL used the PSEP Modified Lloyd-Kahn method; ARI used the Plumb, 1981 method.

SL = screening level. ML = maximum level

TEL = threshold effects level. LAET = Lowest Apparent Effects Threshold. 2LAET = Second Lowest Apparent Effects Threshold. PEC = probable effect concentration

U = compound analyzed but not detected above the reporting limit. H = sample analyzed outside holding time. J = estimated value. M

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results												
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-1520	POV-1621	POV-1722	POV-2328	POV-2328 DUP	POV-2429	POV-2530								
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/17/06	10/17/06	10/16/06	10/19/06	10/19/06	10/19/06	10/18/06							
Conventional Parameters																							
Ammonia (mg/kg)	--	--	--	--	--	--	--	--	17	17	19	17	17	18	18								
Total Solids (%)	--	--	--	--	--	--	--	--	85	84	78	82	82	78	79								
Total Volatile Solids (%)	--	--	--	--	--	--	--	--	0.63	0.6	1.2	0.63	0.64	0.63	0.64	J							
Total Organic Carbon (%) ⁴	--	--	--	--	--	9.82	--	--	0.055	J	0.094	J	0.0503	U	0.158	J	0.074	J	nm				
Total Sulfides (mg/kg)	--	--	--	--	--	702	941	--	6.0	UJ	6.0	UJ	6.8	UJ	6.8	UJ	6.2	UJ	6.0	UJ			
Metals (mg/kg)																							
Antimony	--	150	200	--	--	--	0.6	1.9	--	0.055	JB M	0.069	JB M	0.042	JB M	0.091	JB M	0.13	JB M	0.1	JB M	0.17	M
Arsenic	57	57	700	20	20	5.9	31.4	50.9	33	1.3		1.3		2		1.2		1.1		1.5		1.2	
Cadmium	5.1	5.1	14	2	25	0.596	2.39	2.9	4.98	0.0042	U	0.0043	U	0.0043	U	0.0045	U	0.0041	U	0.0046	U	0.0045	U
Chromium	260	--	--	19	42	37.3	95	133	111	7.2		7.9		11		7.4		8.5		8.6		6.9	
Copper	390	390	1,300	--	100	35.7	619	829	149	7.3		6.4		9.2		6.7		7.2		7.7		7	
Lead	450	450	1,200	1,000	220	35.0	335	431	128	1.7		1.7		2		2		2		2.3		1.7	
Mercury	0.41	0.41	2.3	2	9	0.174	0.8	3.04	1.06	0.0076	U	0.0086	U	0.0083	U	0.0077	U	0.0071	U	0.0091	U	0.0094	U
Nickel	--	140	370	--	1000	18.0	53.1	113	48.6	9.3		8.3		11		8		8		9.5		7.2	
Silver	6.1	6.1	8.4	--	--	0.545	3.5	--	0.03	M	0.027	M	0.048	M	0.035	M	0.041	M	0.044	M	0.049	M	
Zinc	410	410	3,800	--	270	123.1	683	1080	459	22		22		30		25		27		27		23	
Organotins (ug/kg, bulk)																							
Dibutyltin	--	--	--	--	--	--	--	--	0.14	UJ	0.14	UJ	0.15	UJ	0.15	UJ	0.14	UJ	0.15	UJ	0.15	UJ	
Monobutyltin	--	--	--	--	--	--	--	--	0.085	UJ	0.083	UJ	0.089	UJ	0.088	UJ	0.086	UJ	0.093	UJ	0.091	UJ	
Tetra-n-butyltin	--	--	--	--	--	--	--	--	0.43	UJ	0.42	UJ	0.45	UJ	0.45	UJ	0.44	UJ	0.47	UJ	0.46	UJ	
Tributyltin (bulk)	--	75 (SEF)	--	--	--	--	--	--	0.46	UJ	0.44	UJ	0.47	UJ	0.47	UJ	0.46	UJ	0.49	UJ	0.49	UJ	
Polynuclear Aromatic Hydrocarbons (ug/kg)																							
2-Methylnaphthalene	38	670	1,900	--	--	--	469	555	--	3.2	U	3.6	U	3.8	U	3.5	U	3.7	U	3.9	U	3.7	U
Acenaphthene	16	500	2,000	--	--	--	1060	1320	--	5.9	U	6.5	U	7	U	6.4	U	6.7	U	7.2	U	6.8	U
Acenaphthylene	66	560	1,300	--	--	--	470	640	--	2.4	U	2.6	U	2.8	U	2.6	U	2.7	U	2.9	U	2.7	U
Anthracene	220	960	13,000	--	--	--	1230	1580	845	4.4	U	4.9	U	5.3	U	4.8	U	5.1	U	5.4	U	5.1	U
Fluorene	23	540	3,600	--	--	--	1070	3850	536	2.7	U	3	U	3.2	U	2.9	U	3.1	U	3.3	U	3.1	U
Naphthalene	99	2,100	2,400	5,000	--	--	529	1310	561	5.9	U	6.5	U	7	U	6.4	U	6.7	U	7.2	U	6.8	U
Phenanthrene	100	1,500	21,000	--	30,000	41.9	6,100	7,570	1170	4.1	U	4.6	U	4.9	U	4.5	U	4.7	U	5.1	U	4.8	U
Total LPAH	370	5,200	29,000	--	--	--	6590	9200	--														
Benzo[a]anthracene	110	1,300	5,100	--	--	31.7	4260	5800	1050	6.7	U	7.4	U	8	U	7.3	U	7.7	U	8.2	U	7.7	U
Benzo[a]pyrene	99	1,600	3,600	2,000	--	31.9	3300	4810	1450	8.7	U	9.7	U	10	U	9.6	U	10	U	11	U	10	U
Benzo[g,h,i]perylene	31	670	3,200	--	--	--	4020	5200	--	7.5	U	8.4	U	9	U	8.2	U	8.6	U	9.2	U	8.7	U
Benzofluoranthene (b + k)	230	3,200	9,900	--	--	--	11000	13800	--	10	U	11	U	12	U	11	U	12	U	13	U	12	U
Chrysene	110	1,400	21,000	--	--	57.1	5940	6400	1290	7.7	U	8.6	U	9.2	U	8.4	U	8.9	U	9.5	U	8.9	U
Dibenzo(a,h)anthracene	12	230	1,900	--	--	--	800	839	--	12	U	14	U	15	U	14	U	14	U	15	U	14	U
Fluoranthene	160	1,700	30,000	--	--	111	11100	15000	2230	3.2	U	3.6	U	3.8	U	3.5	U	3.7	U	6.1	J M	3.7	U
Indeno[1,2,3-cd]pyrene	34	600	16,000																				

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results												
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-1520	POV-1621	POV-1722	POV-2328	POV-2328 DUP	POV-2429	POV-2530								
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/17/06	10/17/06	10/16/06	10/19/06	10/19/06	10/19/06	10/19/06	10/18/06						
Phthalates (ug/kg)																							
Bis(2-ethylhexyl) phthalate	47	8,300	--	--	--	2520	6380	--	250	U	270	U	300	U	270	U	280	U	300	U	290	U	
Butyl benzyl phthalate	4.9	970	--	--	--	260	366	--	30	U	33	U	36	U	33	U	34	U	37	U	35	U	
Diethyl phthalate	61	1,200	--	--	--	--	--	--	7.4	U	8.2	U	8.9	UJ	8.1	U	8.5	U	9.1	U	8.6	U	
Dimethyl phthalate	53	1,400	--	--	--	311	436	--	7.9	U	8.8	U	9.5	U	8.7	U	9.1	U	9.7	U	9.2	U	
Di-n-butyl phthalate	220	5,100	--	--	200,000	--	103	--	--	58	JB M	62	JB M	16	U	65	JB M	66	JB M	71	JB M	15	U
Di-n-octyl phthalate	58	6,200	--	--	--	--	11	201	--	34	U	190	M	41	U	37	U	39	U	42	U	39	U
Phenols (ug/kg)																							
2,4-Dimethylphenol	29	29	210	--	--	--	--	--	20	U	22	U	23	U	21	U	22	U	24	U	23	U	
2-Methylphenol	63	63	77	--	--	--	--	--	29	U	32	U	34	U	32	U	33	U	35	U	33	U	
3 & 4 Methylphenol	670	670	3,600	--	--	--	760	2360	--	55	U	61	U	65	U	60	U	63	U	67	U	63	U
Pentachlorophenol	360	400	690	--	11,000	--	--	--	32	U	36	U	38	U	35	U	37	U	39	U	37	U	
Phenol	420	420	1,200	--	--	--	--	--	28	U	31	U	33	U	30	U	32	U	34	U	32	U	
Miscellaneous Extractables (ug/kg)																							
Benzoic acid	650	650	760	--	--	--	2910	3790	--	850	U	950	U	1000	U	940	UJ	980	UJ	1000	UJ	990	U
Benzyl alcohol	57	57	870	--	--	--	--	--	31	U	34	U	37	U	34	U	35	U	38	U	36	U	
Dibenzofuran	15	540	1,700	--	--	--	399	443	--	17	U	19	U	21	U	19	U	20	U	21	U	20	U
Hexachlorobutadiene	3.9	29	270	--	--	--	--	--	0.1	U	0.097	U	0.13	U	0.12	U	0.13	U	0.14	U	0.11	U	
N-Nitrosodiphenylamine	11	28	130	--	--	--	--	--	15	UJ	17	UJ	18	UJ	17	U	18	U	19	U	18	U	
Pesticides (ug/kg)																							
4,4'-DDD	--	--	--	--	--	3.54	96	--	28.0	0.25	U	0.24	U	0.33	U	0.31	U	0.33	U	0.34	U	0.27	U
4,4'-DDE	--	--	--	--	--	1.42	21	--	31.3	0.21	U	0.21	U	0.29	U	0.26	U	0.28	U	0.29	U	0.23	U
4,4'-DDT	--	--	--	--	--	--	19	--	62.9	0.25	U	0.24	U	0.33	U	0.3	U	0.32	U	0.34	U	0.27	U
Total DDT	--	6.9	69	4,000	1,000	6.98	--	--	572														
Aldrin	--	10	--	--	170	--	--	--	0.1	U	0.097	U	0.13	U	0.12	U	0.13	U	0.14	U	0.11	U	
alpha-Chlordane	--	10	--	--	1,000	4.5	--	--	17.6	0.11	U	0.22	M	0.15	U	0.14	U	0.15	U	0.15	U	0.12	U
Dieldrin	--	10	--	--	170	2.85	--	--	61.8	0.21	U	0.2	U	0.28	U	0.25	U	0.27	U	0.28	U	0.23	U
gamma-BHC (Lindane)	--	10	--	10	--	0.94	--	--	4.99	0.11	U	0.11	U	0.15	U	0.13	U	0.14	U	0.15	U	0.12	U
Heptachlor	--	10	--	--	--	0.6	--	--	16.0	0.13	U	0.12	U	0.17	U	0.15	U	0.16	U	0.17	U	0.14	U
Polychlorinated biphenyls (mg/kg)																							
PCB-1016	--	--	--	--	--	--	--	--	0.0062	U	0.0065	U	0.0072	UJ	0.007	U	0.0065	U	0.0074	U	0.007	U	
PCB-1221	--	--	--	--	--	--	--	--	0.0062	U	0.0065	U	0.0072	U	0.007	U	0.0065	U	0.0074	U	0.007	U	
PCB-1232	--	--	--	--	--	--	--	--	0.0062	U	0.0065	U	0.0072	U	0.007	U	0.0065	U	0.0074	U	0.007	U	
PCB-1242	--	--	--	--	--	--	--	--	0.0062	U	0.0065	U	0.0072	U	0.007	U	0.0065	U	0.0074	U	0.007	U	
PCB-1248	--	--	--	--	--	--	--	--	0.0062	U	0.0065	U	0.0072	U	0.007	U	0.0065	U	0.0074	U	0.007	U	
PCB-1254	--	--	--	--	--	--	230	294	--	0.0016	U	0.0017	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U	0.0018	U
PCB-1260	--	--	--	--	--	--	138	140	--	0.0016	U	0.0017	U	0.0019	UJ	0.0018	U	0.0017	U	0.0019	U	0.0018	U
Total PCBs	12	0.13	3.1	10.0	2.0	0.0341	62	354	676														

Notes:

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels											Analytical results											
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-2631	POV-2732	POV-3338	POV-3439	POV-3540	POV-3641	POV-3742								
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/17/06	10/16/06	10/19/06	10/18/06	10/17/06	10/17/06	10/16/06	10/17/06	10/17/06	10/16/06	10/17/06	10/16/06		
Conventional Parameters																							
Ammonia (mg/kg)	--	--	--	--	--	--	--	--	17	18	17	18	17	17	17	17	17	17	17	17	17		
Total Solids (%)	--	--	--	--	--	--	--	--	83	78	82	78	84	83	85								
Total Volatile Solids (%)	--	--	--	--	--	--	--	--	0.59	0.43	0.69	0.6	J	0.56	0.53	0.55							
Total Organic Carbon (%) ⁴	--	--	--	--	--	9.82	--	--	0.050	J	nm	0.208	J	0.179	J	0.084	J	0.126	J	0.0502	U		
Total Sulfides (mg/kg)	--	--	--	--	--	702	941	--	6.2	UJ	6.3	UJ	6.6	UJ	6.4	UJ	6.1	UJ	6.1	UJ	6.9	UJ	
Metals (mg/kg)																							
Antimony	--	150	200	--	--	--	0.6	1.9	--	0.1	M	0.052	JB M	0.19	JB M	0.12	M	0.06	M	0.16	M	0.045	JB M
Arsenic	57	57	700	20	20	5.9	31.4	50.9	33	1		1.5		1.4		1.8		1.2		1.1		1.3	
Cadmium	5.1	5.1	14	2	25	0.596	2.39	2.9	4.98	0.0043	U	0.0045	U	0.0034	U	0.0046	U	0.0044	U	0.0043	U	0.0042	U
Chromium	260	--	--	19	42	37.3	95	133	111	7.3		9.8		8.2		7.6		7.2		7.9		9.9	
Copper	390	390	1,300	--	100	35.7	619	829	149	6.2		8.7		6.9		6.3		6.8		6.2		7.4	
Lead	450	450	1,200	1,000	220	35.0	335	431	128	1.9		2		2.6		2		2.1		2.1		2.1	
Mercury	0.41	0.41	2.3	2	9	0.174	0.8	3.04	1.06	0.0074	U	0.0085	M	0.0074	U	0.01	U	0.009	U	0.068		0.0086	U
Nickel	--	140	370	--	1000	18.0	53.1	113	48.6	8.6		11		10		8		8.3		8		10	
Silver	6.1	6.1	8.4	--	--	0.545	3.5	--	0.027	M	0.042	M	0.04	M	0.036	M	0.038	M	0.022	M	0.038	M	
Zinc	410	410	3,800	--	270	123.1	683	1080	459	25		28		32		26		27		29		31	
Organotins (ug/kg, bulk)																							
Dibutyltin	--	--	--	--	--	--	--	--	0.14	UJ	0.15	UJ	0.14	UJ	0.15	UJ	0.14	UJ	0.14	UJ	0.14	UJ	
Monobutyltin	--	--	--	--	--	--	--	--	0.083	UJ	0.089	UJ	0.086	UJ	0.092	UJ	0.086	UJ	0.083	UJ	0.082	UJ	
Tetra-n-butyltin	--	--	--	--	--	--	--	--	0.42	UJ	0.45	UJ	0.44	UJ	0.47	UJ	0.44	UJ	0.42	UJ	0.42	UJ	
Tributyltin (bulk)	--	75 (SEF)	--	--	--	--	--	--	0.45	UJ	0.48	UJ	0.46	UJ	0.49	UJ	0.46	UJ	0.44	UJ	0.44	UJ	
Polynuclear Aromatic Hydrocarbons (ug/kg)																							
2-Methylnaphthalene	38	670	1,900	--	--	--	469	555	--	3	U	3.8	U	3.6	U	3.7	U	3.7	U	2.6	U	3.5	U
Acenaphthene	16	500	2,000	--	--	--	1060	1320	--	5.6	U	6.9	U	6.6	U	6.9	U	6.8	U	4.8	U	6.5	U
Acenaphthylene	66	560	1,300	--	--	--	470	640	--	2.3	U	2.8	U	2.7	U	2.8	U	2.7	U	2	U	2.6	U
Anthracene	220	960	13,000	--	--	--	1230	1580	845	4.2	U	5.2	U	5	U	5.2	U	5.1	U	3.6	U	4.9	U
Fluorene	23	540	3,600	--	--	--	1070	3850	536	2.6	U	3.2	U	3	U	3.1	U	3.1	U	2.2	U	3	U
Naphthalene	99	2,100	2,400	5,000	--	--	529	1310	561	5.6	U	6.9	U	6.6	U	6.9	U	6.8	U	4.8	U	6.5	U
Phenanthrene	100	1,500	21,000	--	30,000	41.9	6,100	7,570	1170	3.9	U	4.9	U	4.6	U	4.8	U	4.8	U	3.4	U	4.6	U
Total LPAH	370	5,200	29,000	--	--	--	6590	9200	--														
Benzo[a]anthracene	110	1,300	5,100	--	--	31.7	4260	5800	1050	6.4	U	7.9	U	7.5	U	7.9	U	7.7	U	5.5	U	7.4	U
Benzo[a]pyrene	99	1,600	3,600	2,000	--	31.9	3300	4810	1450	8.3	U	10	U	9.9	U	10	U	10	U	7.2	U	9.7	U
Benzo[g,h,i]perylene	31	670	3,200	--	--	--	4020	5200	--	7.2	U	8.9	U	8.5	U	8.8	U	8.7	U	6.2	U	8.3	U
Benzofluoranthene (b + k)	230	3,200	9,900	--	--	--	11000	13800	--	9.8	U	12	U	12	U	12	U	12	U	8.5	U	11	U
Chrysene	110	1,400	21,000	--	--	57.1	5940	6400	1290	7.4	U	9.1	U	8.7	U	9.1	U	8.9	U	6.4	U	8.6	U
Dibenzo(a,h)anthracene	12	230	1,900	--	--	--	800	839	--	12	U	15	U	14	U	14	U						

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results												
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-2631	POV-2732	POV-3338	POV-3439	POV-3540	POV-3641	POV-3742								
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/17/06	10/16/06	10/19/06	10/18/06	10/17/06	10/17/06	10/16/06							
Phthalates (ug/kg)																							
Bis(2-ethylhexyl) phthalate	47	8,300	--	--	--	2520	6380	--	240	U	290	U	280	U	290	U	290	U	200	U	270	U	
Butyl benzyl phthalate	4.9	970	--	--	--	260	366	--	28	U	35	U	34	U	35	U	35	U	25	U	33	U	
Diethyl phthalate	61	1,200	--	--	--	--	--	--	7.1	U	8.7	UJ	8.4	U	8.7	U	8.6	U	6.1	U	8.2	UJ	
Dimethyl phthalate	53	1,400	--	--	--	311	436	--	7.6	U	9.3	U	8.9	U	9.3	U	9.2	U	6.5	U	8.8	U	
Di-n-butyl phthalate	220	5,100	--	--	200,000	--	103	--	60	JB M	16	U	67	JB M	16	U	15	U	48	JB M	15	U	
Di-n-octyl phthalate	58	6,200	--	--	--	11	201	--	32	U	40	U	38	U	40	U	39	U	140	M	38	U	
Phenols (ug/kg)																							
2,4-Dimethylphenol	29	29	210	--	--	--	--	--	19	U	23	U	22	U	23	U	23	U	16	U	22	U	
2-Methylphenol	63	63	77	--	--	--	--	--	27	U	34	U	33	U	34	U	33	U	24	U	32	U	
3 & 4 Methylphenol	670	670	3,600	--	--	760	2360	--	52	U	64	U	62	U	64	U	63	U	45	U	61	U	
Pentachlorophenol	360	400	690	--	11,000	--	--	--	30	U	38	U	36	U	37	U	37	U	26	U	35	U	
Phenol	420	420	1,200	--	--	--	--	--	27	U	33	U	31	U	33	U	32	U	23	U	31	U	
Miscellaneous Extractables (ug/kg)																							
Benzoic acid	650	650	760	--	--	--	2910	3790	--	820	U	1000	U	960	UJ	1000	U	990	U	700	U	950	U
Benzyl alcohol	57	57	870	--	--	--	--	--	29	U	36	U	35	U	36	U	36	U	25	U	34	U	
Dibenzofuran	15	540	1,700	--	--	--	399	443	--	17	U	21	U	20	U	21	U	20	U	14	U	19	U
Hexachlorobutadiene	3.9	29	270	--	--	--	--	--	0.11	U	0.13	U	0.13	U	0.093	UJ	0.1	U	0.11	U	0.12	U	
N-Nitrosodiphenylamine	11	28	130	--	--	--	--	--	15	UJ	18	UJ	17	U	18	U	18	U	13	UJ	17	UJ	
Pesticides (ug/kg)																							
4,4'-DDD	--	--	--	--	--	3.54	96	--	28.0	0.27	U	0.33	U	0.32	U	0.23	UJ	0.25	U	0.26	U	0.3	U
4,4'-DDE	--	--	--	--	--	1.42	21	--	31.3	0.23	U	0.28	U	0.27	U	0.2	UJ	0.22	U	0.22	U	0.25	U
4,4'-DDT	--	--	--	--	--	--	19	--	62.9	0.27	U	0.33	U	0.32	U	0.35	JM	0.34	M	0.26	U	0.29	U
Total DDT	--	6.9	69	4,000	1,000	6.98	--	--	572														
Aldrin	--	10	--	--	170	--	--	--	0.11	U	0.13	U	0.13	U	0.093	UJ	0.1	U	0.11	U	0.12	U	
alpha-Chlordane	--	10	--	--	1,000	4.5	--	--	17.6	0.12	U	0.15	U	0.14	U	0.1	UJ	0.11	U	0.12	U	0.13	U
Dieldrin	--	10	--	--	170	2.85	--	--	61.8	0.22	U	0.27	U	0.27	U	0.19	UJ	0.21	U	0.22	U	0.25	U
gamma-BHC (Lindane)	--	10	--	10	--	0.94	--	--	4.99	0.12	U	0.14	U	0.14	U	0.1	UJ	0.11	U	0.11	U	0.13	U
Heptachlor	--	10	--	--	--	0.6	--	--	16.0	0.14	U	0.17	U	0.16	U	0.12	UJ	0.13	U	0.13	U	0.15	U
Polychlorinated biphenyls (mg/kg)																							
PCB-1016	--	--	--	--	--	--	--	--	0.0068	U	0.0068	UJ	0.0066	U	0.0074	U	0.0068	U	0.0064	U	0.0067	UJ	
PCB-1221	--	--	--	--	--	--	--	--	0.0068	U	0.0068	U	0.0066	U	0.0074	U	0.0068	U	0.0064	U	0.0067	U	
PCB-1232	--	--	--	--	--	--	--	--	0.0068	U	0.0068	U	0.0066	U	0.0074	U	0.0068	U	0.0064	U	0.0067	U	
PCB-1242	--	--	--	--	--	--	--	--	0.0068	U	0.0068	U	0.0066	U	0.0074	U	0.0068	U	0.0064	U	0.0067	U	
PCB-1248	--	--	--	--	--	--	--	--	0.0068	U	0.0068	U	0.0066	U	0.0074	U	0.0068	U	0.0064	U	0.0067	U	
PCB-1254	--	--	--	--	--	230	294	--	0.0018	U	0.0018	U	0.0017	U	0.0019	U	0.0018	U	0.0017	U	0.0017	U	
PCB-1260	--	--	--	--	--	138	140	--	0.0018	U	0.0018	UJ	0.0017	U	0.0019	U	0.0018	U	0.0017	U	0.0017	UJ	
Total PCBs	12	0.13	3.1	10.0	2.0	0.0341	62	354	676														

Notes:

-- Indicates no numerical criterion of this type for this chemical. nm = not measured

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results						
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-4344	POV-4546	POV-4748	POV-4952	POV-5051				
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/19/06	10/19/06	10/17/06	10/19/06	10/19/06			
Conventional Parameters																	
Ammonia (mg/kg)	--	--	--	--	--	--	--	--	17	17	17	18	17				
Total Solids (%)	--	--	--	--	--	--	--	--	84	84	83	J	80	85			
Total Volatile Solids (%)	--	--	--	--	--	--	--	--	0.65	0.61	0.66	0.62	0.63				
Total Organic Carbon (%) ⁴	--	--	--	--	--	9.82	--	--	nm	0.111	J	0.0504	U	0.061	J	0.091	
Total Sulfides (mg/kg)	--	--	--	--	--	702	941	--	5.9	UJ	6.6	UJ	6.8	UJ	6.5	UJ	
Metals (mg/kg)																	
Antimony	--	150	200	--	--	0.6	1.9	--	0.12	JB M	0.095	JB M	0.041	JB M	0.076	JB M	
Arsenic	57	57	700	20	20	5.9	31.4	50.9	33	0.93		1	1.2		1.2	1.2	
Cadmium	5.1	5.1	14	2	25	0.596	2.39	2.9	4.98	0.0041	U	0.0045	U	0.0043	U	0.0042	U
Chromium	260	--	--	19	42	37.3	95	133	111	7.2		8.4		8.1		8	7.5
Copper	390	390	1,300	--	100	35.7	619	829	149	6.2		6.8		6.3		6.7	6.7
Lead	450	450	1,200	1,000	220	35.0	335	431	128	2.3		2.2		2		2	2.7
Mercury	0.41	0.41	2.3	2	9	0.174	0.8	3.04	1.06	0.0086	U	0.0075	U	0.0071	U	0.0088	U
Nickel	--	140	370	--	1000	18.0	53.1	113	48.6	7.2		9.1		9.2		9.8	7.5
Silver	6.1	6.1	8.4	--	--	0.545	3.5	--	0.035	M	0.037	M	0.025	M	0.045	M	0.039
Zinc	410	410	3,800	--	270	123.1	683	1080	459	28		29		25		25	35
Organotins (ug/kg, bulk)																	
Dibutyltin	--	--	--	--	--	--	--	--	0.14	UJ	0.14	UJ	0.14	UJ	0.14	UJ	0.13
Monobutyltin	--	--	--	--	--	--	--	--	0.084	UJ	0.084	UJ	0.085	UJ	0.088	UJ	0.081
Tetra-n-butyltin	--	--	--	--	--	--	--	--	0.43	UJ	0.43	UJ	0.43	UJ	0.44	UJ	0.41
Tributyltin (bulk)	--	75 (SEF)	--	--	--	--	--	--	0.45	UJ	0.45	UJ	0.46	UJ	0.47	UJ	0.43
Polynuclear Aromatic Hydrocarbons (ug/kg)																	
2-Methylnaphthalene	38	670	1,900	--	--	469	555	--	3.5	U	3.6	U	2.5	U	3.7	U	3.6
Acenaphthene	16	500	2,000	--	--	1060	1320	--	6.5	U	6.6	U	4.6	U	6.8	U	6.6
Acenaphthylene	66	560	1,300	--	--	470	640	--	2.6	U	2.7	U	1.9	U	2.8	U	2.6
Anthracene	220	960	13,000	--	--	1230	1580	845	4.9	U	5	U	3.5	U	5.2	U	5
Fluorene	23	540	3,600	--	--	1070	3850	536	2.9	U	3	U	2.1	U	3.1	U	3
Naphthalene	99	2,100	2,400	5,000	--	529	1310	561	6.5	U	6.6	U	4.6	U	6.8	U	6.6
Phenanthrene	100	1,500	21,000	--	30,000	41.9	6,100	7,570	1170	4.5	U	4.6	U	3.3	U	4.8	U
Total LPAH	370	5,200	29,000	--	--	6590	9200	--									
Benzo[a]anthracene	110	1,300	5,100	--	--	31.7	4260	5800	1050	7.4	U	7.5	U	5.3	U	7.8	U
Benzo[a]pyrene	99	1,600	3,600	2,000	--	31.9	3300	4810	1450	9.6	U	9.8	U	6.9	U	10	U
Benzo[g,h,i]perylene	31	670	3,200	--	--	4020	5200	--	8.3	U	8.4	U	6	U	8.8	U	8.4
Benzofluoranthene (b + k)	230	3,200	9,900	--	--	11000	13800	--	11	U	12	U	8.2	U	12	U	12
Chrysene	110	1,400	21,000	--	--	57.1	5940	6400	1290	8.5	U	8.7	U	6.1	U	9	U
Dibenzo(a,h)anthracene	12	230	1,900	--	--	800	839	--	14	U	14	U	9.8	U	14	U	14
Fluoranthene	160	1,700	30,000	--	--	111	11100	15000	2230	3.5	U	3.6	U	2.5	U	3.7	U
Indeno[1,2,3-cd]pyrene	34	600	16,000	--	--	4120	5300	--	14	U	14	U	9.8	U	14	U	14
Pyrene	1,000	2,600	16,000	--	--	53	8790	16000	1520	3.1	U	3.1	U	2.2	U	3.2	U
Total HPAH	960	12,000	69,000	--	--	31640	54800	--									
Chlorinated Hydrocarbons (ug/kg)																	
1,2,4-Trichlorobenzene	0.81	31	64	--	--	--	--	--	11	U	11	U	8.1	U	12	U	11
1,2-Dichlorobenzene	2.3	35	110	--	--	--	--	--	19	U	20	U	14	U	20	U	20
1,4-Dichlorobenzene	3.1	110	120	--	--	--	--	--	8.6	U	8.8	U	6.2	U	9.1	U	8.8
Hexachlorobenzene	0.38	22	230	--	--	--	--	--	0.2	U	0.2	U	0.18	U	0.23	U	0.2

Table 4
Port of Vancouver
Analytical Data

Analyte	Screening Levels										Analytical results								
	Sediment Mgt. Standards ¹	Dredged Material Evaluation Framework	Model Toxic Control Act		NOAA SQuIRT ²	WA Ecology Freshwater SQS		MacDonald ³	POV-4344	POV-4546	POV-4748	POV-4952	POV-5051						
	SQS	SL	ML	MTCA1	MTCA2	Freshwater TEL	2003 LAET	2003 2LAET	Consensus-based PEC	10/19/06	10/19/06	10/17/06	10/19/06	10/19/06					
Phthalates (ug/kg)																			
Bis(2-ethylhexyl) phthalate	47	8,300	--	--	--	2520	6380	--	270	U	280	U	200	U	290	U	280	U	
Butyl benzyl phthalate	4.9	970	--	--	--	260	366	--	33	U	33	U	24	U	35	U	33	U	
Diethyl phthalate	61	1,200	--	--	--	--	--	--	8.2	U	8.3	U	5.9	U	8.6	U	8.3	U	
Dimethyl phthalate	53	1,400	--	--	--	311	436	--	8.7	U	8.9	U	6.3	U	9.2	U	8.9	U	
Di-n-butyl phthalate	220	5,100	--	--	200,000	--	103	--	--	63	JB M	66	JB M	48	JB M	71	JB M	65	JB M
Di-n-octyl phthalate	58	6,200	--	--	--	11	201	--	37	U	38	U	140	M	200	JB M	38	U	
Phenols (ug/kg)																			
2,4-Dimethylphenol	29	29	210	--	--	--	--	--	22	U	22	U	15	U	23	U	22	U	
2-Methylphenol	63	63	77	--	--	--	--	--	32	U	32	U	23	U	34	U	32	U	
3 & 4 Methylphenol	670	670	3,600	--	--	760	2360	--	60	U	61	U	43	U	64	U	61	U	
Pentachlorophenol	360	400	690	--	11,000	--	--	--	35	U	36	U	25	U	37	U	36	U	
Phenol	420	420	1,200	--	--	--	--	--	31	U	31	U	22	U	32	U	31	U	
Miscellaneous Extractables (ug/kg)																			
Benzoic acid	650	650	760	--	--	2910	3790	--	940	UJ	960	UJ	680	U	1000	UJ	960	UJ	
Benzyl alcohol	57	57	870	--	--	--	--	--	34	U	35	U	24	U	36	U	35	U	
Dibenzofuran	15	540	1,700	--	--	399	443	--	19	U	20	U	14	U	20	U	20	U	
Hexachlorobutadiene	3.9	29	270	--	--	--	--	--	0.12	U	0.12	U	0.11	U	0.13	U	0.12	U	
N-Nitrosodiphenylamine	11	28	130	--	--	--	--	--	17	U	17	U	12	UJ	18	U	17	U	
Pesticides (ug/kg)																			
4,4'-DDD	--	--	--	--	--	3.54	96	--	28.0	0.3	U	0.29	U	0.26	U	0.33	U	0.3	U
4,4'-DDE	--	--	--	--	--	1.42	21	--	31.3	0.26	U	0.25	U	0.22	U	0.29	U	0.26	U
4,4'-DDT	--	--	--	--	--	--	19	--	62.9	0.3	U	0.29	U	0.26	U	0.33	U	0.3	U
Total DDT	--	6.9	69	4,000	1,000	6.98	--	--	572										
Aldrin	--	10	--	--	170	--	--	--	0.12	U	0.12	U	0.11	U	0.13	U	0.12	U	
alpha-Chlordane	--	10	--	--	1,000	4.5	--	--	17.6	0.13	U	0.13	U	0.12	U	0.15	U	0.13	U
Dieldrin	--	10	--	--	170	2.85	--	--	61.8	0.25	U	0.24	U	0.22	U	0.28	U	0.25	U
gamma-BHC (Lindane)	--	10	--	10	--	0.94	--	--	4.99	0.13	U	0.13	U	0.11	U	0.15	U	0.13	U
Heptachlor	--	10	--	--	--	0.6	--	--	16.0	0.15	U	0.15	U	0.13	U	0.17	U	0.15	U
Polychlorinated biphenyls (mg/kg)																			
PCB-1016	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0068	U	0.007	U	0.0064	U	
PCB-1221	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0068	U	0.007	U	0.0064	U	
PCB-1232	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0068	U	0.007	U	0.0064	U	
PCB-1242	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0068	U	0.007	U	0.0064	U	
PCB-1248	--	--	--	--	--	--	--	--	0.0066	U	0.0065	U	0.0068	U	0.007	U	0.0064	U	
PCB-1254	--	--	--	--	--	--	230	294	--	0.0017	U	0.0017	U	0.0018	U	0.0018	U	0.0016	U
PCB-1260	--	--	--	--	--	--	138	140	--	0.0017	U	0.0017	U	0.0018	U	0.0018	U	0.0016	U
Total PCBs	12	0.13	3.1	10.0	2.0	0.0341	62	354	676										

Notes:

-- Indicates no numerical criterion of this type for this chemical. nm = not measured

¹Sediment Management Standard (WAC 173-204)

²NOAA SQuIRT - NOAA Screening Quick Reference Tables, developed by the Coastal Protection & Restoration Division of NOAA

³MacDonald - Values obtained from *Prediction of sediment toxicity using consensus-based freshwater sediment quality guidelines*, EPA 905/R-00/00

⁴Total organic carbon (TOC) analyzed via two different methods: STL used the PSEP Modified Lloyd-Kahn method; ARI used the Plumb, 1981 metho

SL = screening level. ML = maximum level

TEL = threshold effects level. LAET = Lowest Apparent Effects Threshold. 2LAET = Second Lowest Apparent Effects Threshold. PEC = probable ef

U = compound analyzed but not detected above the reporting limit. H = sample analyzed outside holding time. J = estimated value. M = result is less

B = analyte detected in sample and method blank (organics). Result reported is less than the reporting limit but greater than detection limit (inorganic

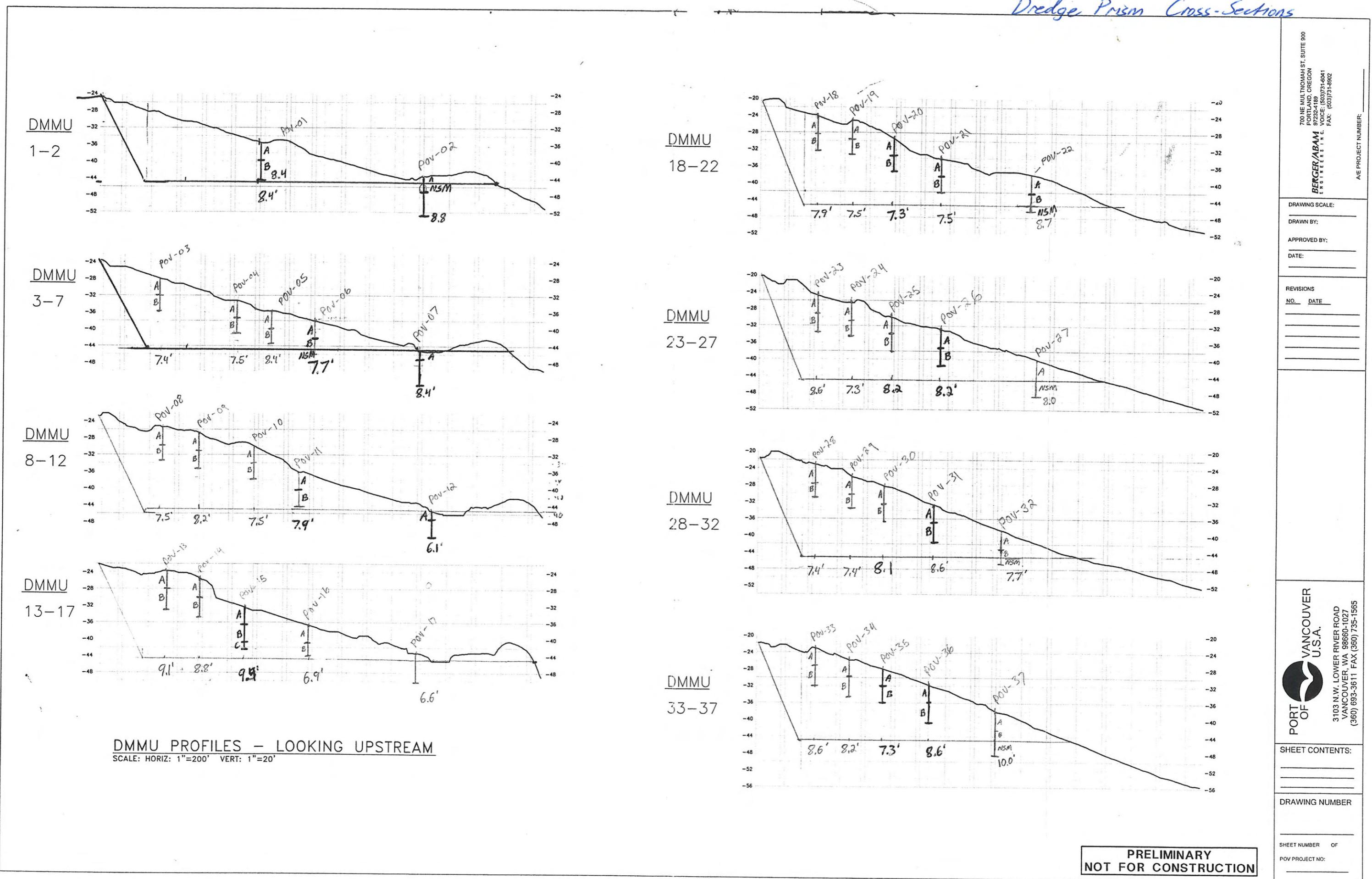
* - duplicate sample analysis is not within control limits (inorganics)

Table 4

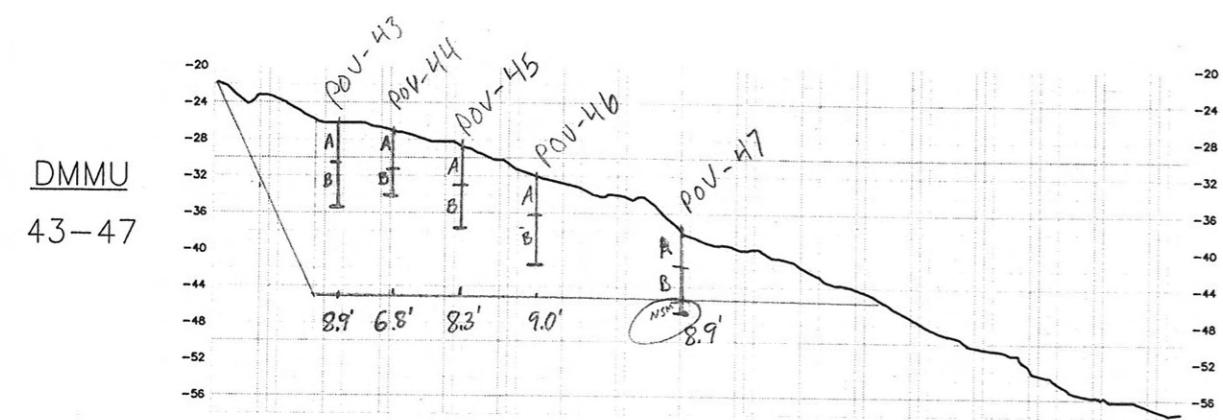
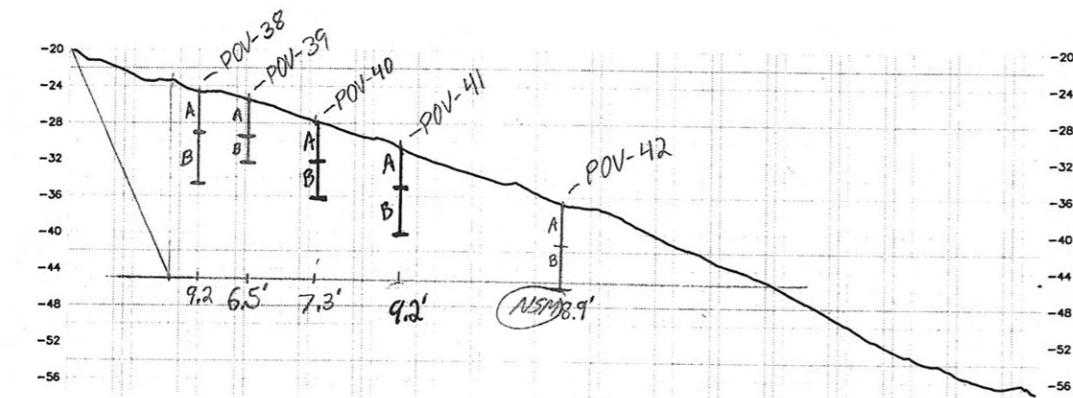
Port of Vancouver - Gateway Expansion
Analytical Data

APPENDIX B
Field Documentation

Dredge Prism Cross-Sections

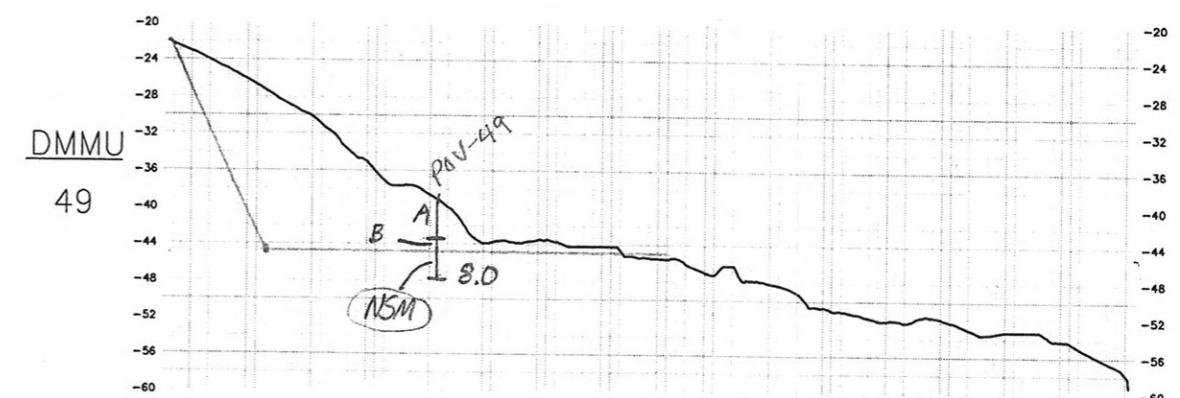
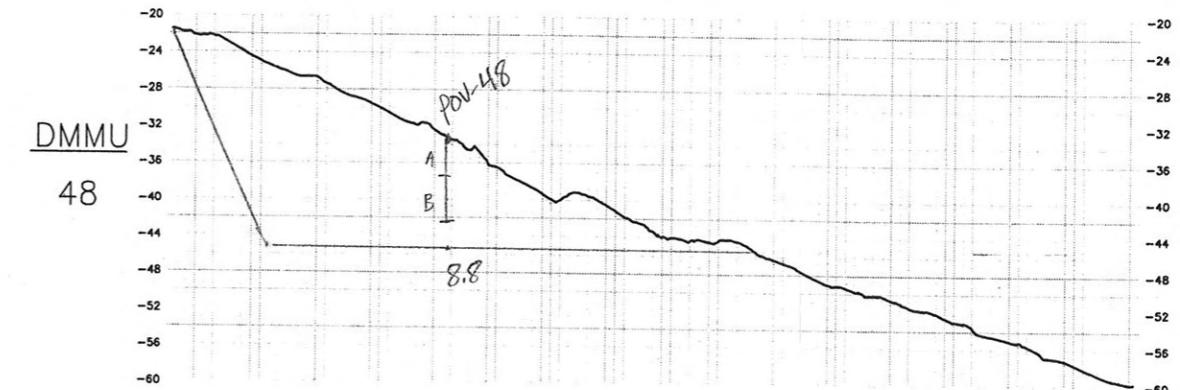


Dredge Prism Cross-Sections



DMMU PROFILES - LOOKING UPSTREAM

SCALE: HORIZ: 1"=200' VERT: 1"=20'



DMMUs 50, 51, 52 not shown

**PRELIMINARY
NOT FOR CONSTRUCTION**

BERGER/ABAM
Engineering & Architecture
700 NE MULTRNOAH ST. SUITE 900
PORTLAND, OREGON
97232-4181
PHONE: (503)733-6041
FAX: (503)733-4892

A/E PROJECT NUMBER: _____

DRAWING SCALE: _____

DRAWN BY: _____

APPROVED BY: _____

DATE: _____

REVISIONS

NO. DATE _____

PORT OF VANCOUVER
U.S.A.
3103 N.W. LOWER RIVER ROAD
VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

SHEET CONTENTS:

DRAWING NUMBER

SHEET NUMBER OF
POV PROJECT NO:

Port of Vancouver Gateway Expansion
Sediment Sample Log
October 2006

(1)

Date	Sample Time	Sample	Sample Interval (ft)	Notes
10-12-06	1110	POV-0308	0-8'9"	
	1357	03A	0-4	
	1406	03B	4-8	
	1426	08A	0-4	
	1435	08B	4-9"	
	1255	POV-0510	0-9'4" / 8'3"	CDC 10-13-06
	1314	05A	0-4	
	1309	05B	4-9'4"	
	1326	10A	0-4	
	1339	10B	4-8'3"	
	1527	POV-0409	0-	
	1609	04A	0-4	
	1616	04B	4-8'8"	
	1505	09A	0-4	
	1539	09B		
10-13-06	1517	POV-0611	0-7'8" / 10'4"	06-8'3" 11-10'4" 7'9"
	1506	POV-06A	0-4	
	1511	POV-06B	4-7	
	1500	POV-0611A	0-4	
	1513	POV-11B	4-7.9	
	1520	POV-06NSM	7-7.7	06NSM NO TBT
	1555	POV-0102		
	1624	POV-01A		CDC 10-17-06
	1629	POV-01B		
	1550	POV-02NSM		
	1545	POV-02A		
	1815	POV-0712		
	1810	POV-07A NSM		
	1806	POV-12		

04- 8'8"

01- 8'10"

02 9'3"

Port of Vancouver Gateway Expansion
Sediment Sample Log
October 2006

2

Date	Sample Time	Sample	Interval (ft)	Notes
10-16-06	0935	POV - 32NSM		
	0955	POV - 32A		
	0945	POV - 32B		
	1005	POV - 2732		
	1010	POV - 27A		
	1015	POV - 27NSM		
	1118	POV - 17A		
	1127	POV - 17NSM		
	1133	POV - 22A		
	1141	POV - 1722		
	1136	POV - 22B		
	1345	POV - 3742		
	1333	POV - 37NSM		
	1325	POV - 37A		
	1335	POV - 37B		
	1300	POV - 42A		
	1305	POV - 42B		
10-16-06	1320	POV - 42NSM		NO TBT
10-17-06	1520	POV - 47A		10-16-06
	1525	POV - 47B		
	1540	POV - 47NSM		
	1516	POV - 48A		
	1523	POV - 48B		
	1535	POV - 4748		
10-17-06	1035	POV - 41A		
	1040	POV - 41B		
	1050	POV - 3641		
	1043	POV - 36A		
10-17-06	1045	POV - 36B		

Port of Vancouver Gateway Expansion
Sediment Sample Log
October 2006

(3)

Date	Sample Time	Sample	Interval (ft)	Notes
10-17-06	1035	POV- 11A		
	1040	POV- 11B		
	1050	POV- 3011		repeated on 1131
	1043	POV- 30A		
	1045	POV- 30B		
	1128	POV- 31A		
	1130	POV- 31B		
	1135	POV- 26A		
	1140	POV- 26B		
	1150	POV- 2631		
	1238	POV- 16A		
	1243	POV- 16B		COC 10-18-06
	1248	POV- 21A		
	1251	POV- 21B		
	1256	POV- 1621		
	1413	POV- 15A		
	1417	POV- 15B		
	1422	POV- 15C		
	1420	POV- 20A		
	1425	POV- 20B		
	1427	POV- 1520		
	1534	POV- 35A		
	1539	POV- 35B		
	1552	POV- 40A		
	1555	POV- 40B		
	1558	POV- 3540		
10-18-06	1040	POV- 25A		COC 10-19-06
	1045	POV- 25B		#1 (Envoy)
	1050	POV- 30A		
	1055	POV- 30B		
	1100	POV- 2530		

Port of Vancouver Gateway Expansion
Sediment Sample Log
October 2006

(4)

Date	Sample Time	Sample	Interval (ft)	Notes
10-18-06	1155	POV-34A		
	1200	POV-34B		
	1205	POV-39A		
	1210	POV-39B		
	1215	POV-3439		
	1303	POV-13A		
	1305	POV-13B		
	1310	POV-18A		COL 10-19-06 #1
	1312	POV-18B		
	1315	POV-1318		Senvoy
	1400	POV-14A		
	1405	POV-14B		
	1410	POV-19A		
	1412	POV-19B		
	1414	POV-1419		
10-19-06	0900	POV-23A		
	0905	POV-23B		
	0910	POV-28A		
	0915	POV-28B		
	0920	POV-2328		# DUP
	0000	POV-DUP		Duplicate of POV-2328
	0955	POV-33A		
	1000	POV-33B		
	1005	POV-38A		COL 10-19-06
	1010	POV-38B		# 2 PMX drop
	1015	POV-3338		off (JB)
	1050	POV-43A		
	1100	POV-43B		
	1103	POV-44A		
	1105	POV-44B		
	1110	POV-4344		

Port of Vancouver Gateway Expansion
Sediment Sample Log
October 2006

5

Chain of Custody Record

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Client	Project Manager	Date	Chain of Custody Number		
Address	Telephone Number (Area Code)/Fax Number	Lab Number	25313		
City	Site Contact	Date	Page		
Project Name and Location (State)	Carrier/Waybill Number	10-13-06	1 of 2		
Contract/Purchase Order/Quote No.	Matrix				
274 4523 003	Containers & Preservatives				
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time			
1 POV-0308	10-12-06	11:00	X		
2 POV-03A		13:57	X		
3 POV-03B		14:06	X		
4 POV-03A		14:26	X		
5 POV-03B		14:35	X		
6 POV-0510		12:55	X		
7 POV-05A		13:14	X		
8 POV-05B		13:09	X		
9 POV-10A		13:26	X		
10 POV-10B		13:39	X		
11 POV-0409		15:27	X		
12 POV-04A		16:09	X		
Cooler	Possible Hazard Identification	Sample Disposal	Disposal By Lab		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	Archive For
Turn Around Time Required (business days)	5 Days	15 Days	Other	2 Months	
<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 5 Days	<input type="checkbox"/> Other		
1. Relinquished By		Date	Time	Date	Time
2. Relinquished By		Date	Time	Date	Time
3. Relinquished By		Date	Time	Date	Time
Comments	3 coolers to go!				

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Client	Paramatrix	Project Manager	Andrea Jones	Date	10-13-06	Chain of Custody Number	25314
Address	700 NE Multnomah #1000	Telephone Number (Area Code/Fax Number)	503 233 4002 / 233 4825	Lab Number	Q	Page	Q of Q
City	PDX	Site Contact	K. Downie	Special Instructions/ Conditions of Receipt			
Project Name and Location (State)	POV Gasaway	Carrier/Manifest Number					
Contract/Purchase Order/Quote No.	274 4523 003	Matrix					
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time		Containers & Preservatives			
13) POV-01B	10-12-06	1616	X	HCl	NaOH	NaCl	NaNO3
14) POV-09A		1505	X	X	X	X	X
15) POV-09B		1539	X	X	X	X	X
Cooler <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Cooler Temp:		Possible Hazard Identification		Sample Disposal		
			<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown
Turn Around Time Required (business days)	24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input type="checkbox"/> 10 Days <input checked="" type="checkbox"/> 15 Days <input type="checkbox"/> Other		Date		Time		QC Requirements (Specify)
1. Relinquished By	<i>[Signature]</i>		10-13-06	1700	1. Received By		Date
2. Relinquished By					2. Received By		Time
3. Relinquished By					3. Received By		Time
Comments	3 coolers 404a						

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Client	Project Matrix	Project Manager	Andrea Jones	Date	10-17-06	Chain of Custody Number	25311
Address		Telephone Number / Area Code/Fax Number		Lab Number			
CITY	Portland	State Zip Code	Oregon 97232	Site Contact	A. Jones	Page	1 of 3
Project Name and Location (State)	POV for Enviro, Vancouver, WA	Carrier/Waybill Number		Lab Contact	K. Davis		
Contract/Purchase Order/Quote No.	a74-1523-023	Sample ID	Servey container	Containers & Preservatives			
	(Containers for each sample may be combined on one line)	Date	Time	Matrix			
				Uptakes			
				Stain			
				NaOH			
				HCl			
				HNO3			
				H2SO4			
				NaOH			
				Uptakes			
				Stain			
				NaOH			
				HCl			
				HNO3			
				H2SO4			
				NaOH			
				Uptakes			
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				HNO3			
				H2SO4			
				NaOH			
				Uptakes			
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				HNO3			
				H2SO4			
				NaOH			
				Uptakes			
				Stain			
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				HCl			
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				H2SO4			
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				Uptakes			
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				H2SO4			
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				Uptakes			
				Stain			
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				HCl			
				HNO3			
				H2SO4			
				NaOH			
				Uptakes			
				Stain			
				NaOH			

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Client	Parametrix	Project Manager	Andrea Somes	Date	10/18/06	Chain of Custody Number	25304
Address	700 NE Market St #100	Telephone Number (Area Code)/Fax Number	503 263 7890/233 6825	Lab Number		Page	2 of 3
City	PDX	Zip Code	97232	Site Contact	A. Somes	Special Instructions/ Conditions of Receipt	
Project Name and Location (State)				Carrier/Waybill Number	K. Davies	Analysis (Attach list if more space is needed)	
Contract/Purchase Order/Quote No.				Matrix	Containers & Preservatives		
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)				Date	Time		
POV-31B				10/17/06	1130	SO2	
POV-36A				1135		HNO3	
POV-26B				1140		H2SO4	
POV-2631				1150		LiBr	
POV-16A				1238		NaOH	
POV-16B				1243		ZnCl2	
POV-214				1248		HOAc	
POV-21B				1251		CH3COOH	
POV-1621				1256		CH3COONa	
POV-15A				1413		CH3COONa	
POV-15B				1417		CH3COONa	
POV-15C				1422		CH3COONa	
Cooler	Possible Hazard Identification				Sample Disposal		X Disposal By Lab
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler Temp:	<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown
Turn Around Time Required (business days)				QC Requirements (Specify)		Archive For _____ Months	
<input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input type="checkbox"/> 10 Days <input checked="" type="checkbox"/> 15 Days <input type="checkbox"/> Other				1. Received By		(A fee may be assessed if samples are retained longer than 1 month)	
1. Relinquished By <i>[Signature]</i>				Date	10/18/06	Time	1130
2. Relinquished By				Date		Time	2. Received By
3. Relinquished By				Date		Time	3. Received By
Comments							

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Client	Provenex Inc		Project Manager	Andrew Somes		Date	10-18-06	Chain of Custody Number	25315	
Address	700 NE Multnomah #1000		Telephone Number (Area Code)/Fax Number	503 963 7810 / 233 4825		Lab Number	3	Page	3 of 3	
City	PDX	State/Zip Code	OR 97232	Site Contact	A. Somes	Lab Contact	K. Daniel	Analysis (Attach list if more space is needed)		
Project Name and Location (State)			POV by Kenway		Carrier/Waybill Number		Special Instructions/ Conditions of Receipt			
Contract/Purchase Order/Quote No.			274 4523 003		Matrix		Containers & Preservatives			
Sample ID and Location/Description (Containers for each sample may be combined on one line)			Date	Time	Time	Medium	Soln	Agarous	Air	
POV-20A			10-17-06	1420	X	X	X	X	X	
POV-20B			1425	X	X	X	X	X	X	
POV-1500			1427	X	X	X	X	X	X	
Cooler	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler Temp:	Possible Hazard Identification		Sample Disposal			Disposal By Lab	
Turn Around Time Required (business days)	<input type="checkbox"/> 24 Hours		<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 5 Days	<input type="checkbox"/> 10 Days	<input checked="" type="checkbox"/> 15 Days	<input type="checkbox"/> Other	<input type="checkbox"/> Unknown	<input checked="" type="checkbox"/> Archive For	
1. Relinquished By	<i>[Signature]</i>				Date	10-18-06	Time	1130	2 Months	
2. Relinquished By					Date		Time		Date	Time
3. Relinquished By					Date		Time		Date	Time
Comments										

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Client	Parametrix	Project Manager	Peter Jones	Date	10-19-06	Chain of Custody Number	25305
Address	700 NE Martin St	Telephone Number/ Area Code/Fax Number	503 233 2400 / 233 1825	Lab Number		Page	1 of 2
City	PDX	Site Contact	A. Jones	Analysis (Attach list if more space is needed)			
Project Name and Location (State)	POV Gateway	Carrier/Mailbill Number	Sen 1817	Special Instructions/ Conditions of Receipt			
Contract/Purchase Order/Quote No.	274 4523 003	Matrix		Containers & Preservatives			
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)				Date	Time		
POV- 35A	10-17-06	1534	X	X			
POV- 35B		1539	X	X			
POV- 40A		1552	X	X			
POV- 40B		1555	X	X			
POV- 3540		1558	X	X	X	X	
POV- 25A	10-18-06	1040	X	X			
POV- 25B		1045	X	X			
POV- 30A		1050	X	X			
POV- 30B		1055	X	X			
POV- 2530		1100	X	X			
POV- 31A		1155	X	X			
POV- 31B		1200	X	X			
Cooler	Possible Hazard Identification				Disposal By Lab		
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler Temp:	<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown
Turn Around Time Required (business days)		15 Days	<input type="checkbox"/> Other	Archive For		<input checked="" type="checkbox"/> Return To Client	
1. Relinquished By		Date	Time	2. Received By		Date	
2. Relinquished By		Date	Time	3. Received By		Date	
3. Relinquished By		Date	Time				
Comments							

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Custody Record**

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Client	Parmentix			Project Manager	Andrew Somes			Date	10-19-06	Chain of Custody Number	26276
Address	700 NE 14th Avenue #1000			Telephone Number (Area Code/Fax Number)	503 963 7880 / 2333 2100			Lab Number	/	Page	1 of 4
City	PDX	State	OR	Zip Code	97232	Site Contact	A. Somes	Carrier/Waybill Number	PDX chop off - (F8)	Special Instructions/ Conditions of Receipt	
Project Name and Location (State)	POV Gateway			Lab Contact	K. Donie			Analysis (Attach list if more space is needed)			
Contract/Purchase Order/Quote No.	(274) 4523 003 5			Containers & Preservatives							
Matrix				Uptakes							
Date				Aqueous							
Time				Air							
				Soil							
				Seal							
				ZnO/H							
				HNO3							
				H2SO4							
				Uptakes							
				Soil							
				Seal							
				ZnO/H							
				HNO3							
				H2SO4							
				Uptakes							
				Soil							
				Seal							
				ZnO/H							
				HNO3							
				H2SO4							
				Uptakes							
				Soil							
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Client Address City Project Name and Location (State) Contract/Purchase Order/Quote No.	Project Manager Telephone Number (Area Code)/Fax Number Site Contact Carrier/Mailbox Number PMN drop off	Date Lab Number Lab Contact Carrier/Mailbox Number PMN drop off (SB)	Date Lab Number Lab Contact Carrier/Mailbox Number PMN drop off (SB)	Analysis (Attach list if more space is needed)									
Special Instructions/ Conditions of Receipt													
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)													
Date Time Date Time Date Time Date Time 10/19/06 1100 10/19/06 1103 10/19/06 1105 10/19/06 1110 10/20/06 1202 10/20/06 1205 10/20/06 1210 10/20/06 1211 10/20/06 1214 10/20/06 1312 10/20/06 1315 10/20/06 1320													
Matrix Containers & Preservatives Uptacs Uptacs Uptacs Agar Agar Agar HgO HgO HgO NaOH NaOH NaOH HCl HCl HCl HNO3 HNO3 HNO3 H2SO4 H2SO4 H2SO4													
Coolers <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temp: Turn Around Time Required (business days) <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 5 Days <input type="checkbox"/> 10 Days <input checked="" type="checkbox"/> 15 Days <input type="checkbox"/> Other													
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Poison B <input type="checkbox"/> Poison A <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Unknown <input type="checkbox"/> Return To Client													
QC Requirements (Specify)													
Disposal By/Lab Disposal Month Disposal Year													
1. Received By Date Time 2. Received By Date Time 3. Received By Date Time													
Comments													

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STL 8274-580 (12/02)

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Client	Parametrix	Project Manager	Andrew Sones	Date	10-19-06	Chain of Custody Number	25309
Address	700 NE Martin Luther King Jr.	Telephone Number / Area Code / Fax Number	503 963 2000 / 233 4825	Lab Number		Page	3 of 4
City	PDX	State Zip Code	OR 97232	Site Contact	K. Dunn	Analysis (Attach list if more space is needed)	
Project Name and Location (State)	POV Gateway	Carrier/Waybill Number	PMX drop off (58)	Lab Contact		Special Instructions/ Conditions of Receipt	
Contract/Purchase Order/Quote No.	Q741 1523 003	Matrix		Containers & Preservatives			
(Containers for each sample may be combined on one line)				Date	Time		
POV-46B	10-19-06	1321		Agar	X		
POV-4546	1325			Agarous	X		
POV-504	1405			Salt	X		
POV-50B	1411			Soil	X		
POV-51A	1416			NaOH	X		
POV-51B	1417			HNO3	X		
POV-505	1422			H2SO4	X		
POV-494	1451			Uptakes	X		
POV-49B	1500			NaCl	X		
POV-52A	1503			HC1	X		
POV-52B	1505			Acetone	X		
POV-4952	1508			Acrylic	X		
Cooler	Possible Hazard Identification		Sample Disposal		Disposal By Lab		
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler Temp:	<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown
Turn Around Time Required (business days)		15 Days	<input type="checkbox"/> Other	QC Requirements (Specify)	<input type="checkbox"/> Return To Client		
<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 5 Days	<input type="checkbox"/> 10 Days	Date	10-19-06	Time	<input type="checkbox"/> Archive For <u>2</u> Months
1. Relinquished By		<u>John Stoen</u>		Date		Time	(A fee may be assessed if samples are retained longer than 1 month)
2. Relinquished By		<u>John Stoen</u>		Date		Time	
3. Relinquished By		<u>John Stoen</u>		Date		Time	
Comments							

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Client Parachute	Project Manager <i>Andrew Sames</i>	Date 10-19-06	Chain of Custody Number 25310
Address 700 NE My Hanna #1000	Telephone Number/Area Code/Fax Number 503 963 7820 / 253 4825	Lab Number 4	Page 4 of 4
City PDX	Site Contact State Zip Code OR 97232	Lab Contact Carrier/Waybill Number <i>A. Sames</i>	Analysis (Attach list if more space is needed)
Project Name and Location (State) PDV	Contract/Purchase Order/Quote No. 274 4523 003	Matrix	Containers & Preservatives
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)		Date	Time
<i>POL-ER</i>		10-19-06	1530
		<input type="checkbox"/> Soil	<input checked="" type="checkbox"/> Air
		<input type="checkbox"/> Sed.	<input type="checkbox"/> Aqueous
		<input type="checkbox"/> HCl	<input type="checkbox"/> NaOH
		<input type="checkbox"/> HNO3	<input type="checkbox"/> NaCl
		<input type="checkbox"/> H2SO4	<input type="checkbox"/> Zinc/NH4
		<input type="checkbox"/> Urine	<input type="checkbox"/> Hg
		<input type="checkbox"/> Blood	<input type="checkbox"/> Arsenic
		<input type="checkbox"/> Hair	<input type="checkbox"/> Lead
		<input type="checkbox"/> Bone	<input type="checkbox"/> Cadmium
		<input type="checkbox"/> Muscle	<input type="checkbox"/> Manganese
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> Arsenicals
		<input type="checkbox"/> Brain	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
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		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Spleen	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Adrenal Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Thymus Gland	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Pancreas	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Heart	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Kidney	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Liver	<input type="checkbox"/> PCBs
		<input type="checkbox"/> Lung	<

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ/DDStation Location: Extreme downstream end of project site in Columbia RiverStation ID: POV-01

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.799 N</u>	<u>120° 45.844 W</u>

C 09:37

Measured Water Depth: - 39.6' (Leadline) Sounder / Other _____)Vertical Datum: + 2.29 (MLLW / MLW / Other I CRD)Mudline Elevation: - 37.31'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 10"Percent Recovery 70% (%)Core/Drive Comments: 5' 2" open / Fine to Med. Grain Size & small grained, red - Sub-angular. Harder material at ≈ 10.5'.

SEDIMENT CORE PROCESSING:

Date: 10/13/062 core sections
0-4', 4-8' 6"Processors: ASOMES MS MarshallGeologist: MS Marshall

Core Section(s)	Depth (in) #	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 1.5	Sand (SP) 95% fine grained sand, 5% fines, medium gray, loose, stiff, composed of lithic? and mineral fragments, micaceous, moderate sorting	
	< >		
	1.5 < > 1.9	Sand (SW) 90% fine grained sand, 5% med fine grained sand, composed of lithic and mineral fragments (cinder/basalt/quartz/feldspars/micas) on calcareous, sub rounded, trace fine gravel, sub rounded to sub angular (lithic) trace fine s, trace coarse grained sand, poorly sorted	
	< >		
	1.9 < > 6.6	Sand (SP) 95% fine grained sand 5% fines, same as 0-1.5 feet	
	6.6 < > 8.4	Sand (SW) same as 1.5-1.9 Trace coarse grained sand	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/04Samplers: JB/SC/BJ/DDStation Location: edge of dredge areaExtreme downstream end
of project site - outsideStation ID: POV-02

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.796 N</u>	<u>122° 45.919 W</u>

@ 1D:15Measured Water Depth: -49.1' (Leadline/ Sounder / Other _____)Vertical Datum: +2.76 (MLLW / MLW / Other +/- CRD)Mudline Elevation: -46.34Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 3"Percent Recovery 73 (%)Core/Drive Comments: 4' 9" open/Fine - Med sand / less gravel than before.

SEDIMENT CORE PROCESSING:

Date: 10/13/042 core sections,
0-4', 4-8.8'Processors: ASomes, MSMarshallGeologist: MSMarshall

Core Section(s)	Depth (<ins>) #	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 1.5	Sand (SW) 85% fine grained sand, 10% medium grained sand consists of lithic and mineral fragments (cinder + Basalt / Quartz, feldspar, mica) surrounded to subangular, incrustous, medium gray loose, stiff poorly sorted trace fine gravel and coarse sand, surrounded subangular, trace fines	
	< >		
	1.5 < > 5.3	Sand (SP) 90% fine grained sand, 5% fines medium gray, loose, stiff, trace med/lime gray sand (cinder + Basalt / Quartz/Feldspar/mica) surrounded	
	< >		
	5.3 < > 8.8	Sand (SW) 85% fine grained sand, 10% medium grained sand consist. of same material as 0-1.5 ft, trace fine gravel / medium grained sand of same material as 0-1.5 ft, trace fines, alternating thin beds of fine to medium grained sand, upward fining	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06

Samplers: JB / SC / BJ / DD

Station Location: Moving offshore from proposed pier headline in
1st row of column of DMU in dredge area downstream end of page ct. Station ID: P0V-03

Coordinates:

Latitude/Northing	Longitude/Easting
$45^{\circ} 39.7732 N$	$122^{\circ} 45.7563 W$

Measured Water Depth: ← 32.7 (Leadline / Sounder / Other) →

Vertical Datum: + 3.18 (MLLW / MLW / Other) ± CRD @ 0945

Mudline Elevation: -29.52

Refusal: None

Percent Recovery 63 (%)

Core/Drive Comments: 6.0' Open/Care material appears to be well-washed grey and
red sand / med. fine to medium sand with coarser material including small
gravel / lots of water in core material - sand not compacted at all.)

SEDIMENT CORE PROCESSING:

Date: 10/12/06

foot

2 core sections Processors: Somes, Marshall
0-4' / 4' - 7'

Geologist: M.S. Marshall

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/11/06Samplers: JB/SC/BJ/DDStation Location: Moving offshore in 1st column of DMNU at
PAK - a downstream end of dredge
area.Station ID: PAK-04

Coordinates:

12:25

Latitude/Northing	Longitude/Easting
<u>45° 39.7697N</u>	<u>122° 45.7784 W</u>

Measured Water Depth: - 36.5' (Leadline / Sounder / Other _____)Vertical Datum: +2.43 (MLLW / MLW / Other TCR @ 12:30)Mudline Elevation: - 34.07'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8x8"Percent Recovery 68 (%)Core/Drive Comments: 5'4" Open / Med. sand / very wet core, material not
compacted

SEDIMENT CORE PROCESSING:

Date: 10/12/06 Qct2 core sections
0-4' / 4-8' 3"Processors: A Somes, M.S. MarshallGeologist: M.S. Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 7.5	Sand 98% fine grained sand, 2% medium grained sand lenses, loose, stiff, micaceous, medium grained sand consists of lithic and mineral fragments (cinder/basalt/quartz + feldspar + mica) rounded to subrounded, trace fine gravel, consist of lithic fragments, rounded to subrounded	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/11/06

Samplers: JTB/SC/BT/DP

Station Location: Downstream end of project - 3rd row of Annus
3rd row from proposed pier head line Station ID: POU-05

Coordinates:

141°30'

Latitude/Northing	Longitude/Easting
45° 39.7588 N	122° 45.8013 W

Measured Water Depth: -40.0' (Leadline / Sounder / Other _____)

Vertical Datum: +1.81 (MLLW / MLW / Other TCD @ 14.3D)

Mudline Elevation: -38.19

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 9' 4"

Percent Recovery 74 (%)

Core/Drive Comments: 4' 8" Open / med. sand, unconsolidated - with coarser material as before / lots of water in sample.

SEDIMENT CORE PROCESSING:

Date: 10/12/06 Feet

3 core sections
0'-4' 4"-7' 7"-8' 11"

Processors: ASones MMashall

Geologist: MShashirell

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 8.4	Sand 98% fine grained sand 2% fine gravel, loose stiff, silaceous medium gray, gravel consists of lithic fragments sand are rounded	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ DD

Station Location: _____

Down stream end of
project site - moving from
in shore to out shore edgeStation ID: P0V-06

Coordinates: _____

Latitude/Northing	Longitude/Easting
<u>45°39.7473 N</u>	<u>122°45.8309 W</u>

@ 10:52Measured Water Depth: -43.1 (Leadline / Sounder / Other _____)Vertical Datum: +3.07 (MLLW / MLW / Other CRD)Mudline Elevation: -40.03Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 3"Percent Recovery 65 (%)Core/Drive Comments: 5' 9" Open/ Fine to med. sand/ small gravel - rounded.

SEDIMENT CORE PROCESSING:

Date: 10/13/062 core sections
0'-4', 4'-7' 9"Processors: ASOMES, MSMarshallGeologist: MSMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 1.2	<u>Sand (SP)</u> 95% fine grained sand, medium gray, loose, stiff, consists of mineral and possible lithic fragments (Quartz, feldspar, mica) micaceous, 5% fines, clay @ 0.5 feet	
	1.2 < > 4.3	<u>Sand (SW)</u> 90% fine grained sand, 10% medium grained sand, consists of lithic and mineral fragments (quartz, feldspar, mica) surrounded to subangular, tan	
	< >	micaceous, medium gray, loose, stiff, trace fine gravel (lithics) surrounded to subangular, poorly sorted	
	4.3 < > 5.4	trace fines	
	5.4 < > 6.3	<u>Sand (SP)</u> 95% fine grained sand, medium gray, loose, stiff, consists of same material as 0-1.2 feet	
	< >		
	6.3 < > 7.7	<u>Sand (SW)</u> 90% fine grained sand, 5% medium grained sand, 5% fine gravel, material and shape same as 1.2-4.3 feet, very poorly sorted, medium gray, loose, stiff, trace fines	
	< >		
	< >	<u>Sand (SW)</u> 80% fine grained sand, 15% medium grained sand, material and shape same as above 1.2-4.3 feet, 5% coarse grain sand, poorly sorted, medium gray, loose, stiff, alternating thin beds of finer to more coarse sand grain sizes	
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ/DPStation Location: Downstream end of project site in the Columbia RiverStation ID: P0V-07

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.7423 N</u>	<u>122° 45.8837 W</u>

@ 12:09Measured Water Depth: -47.8 (Leadline / Sounder / Other _____)Vertical Datum: + 2.93 (MLLW / MLW Other I-CRD)Mudline Elevation: - 44.87Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 11"Percent Recovery 70 (%)Core/Drive Comments: 5' 1" open / same sands as before on top / some silt noted at cut between core sections A & B.

SEDIMENT CORE PROCESSING:

Date: 10/13/062 core sections0-4, 4-8' 6"Processors: MSOMOS MS/Mg/SH/JGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 3.4	<u>Sand (SW)</u> 85% fine grained sand, 10% medium grained sand, consists of mineral and lithic fragments (cinder/basalt/quartz feldspar/mica) micaceous medium gray, loose, stiff, subrounded to subangular 5% fine gravel, subrounded (lithic), trace fines poorly sorted	
	< >		
	3.4 < > 4.4	<u>Silt (ML)</u> medium gray, loose, soft sharp contact above and below, very low plasticity	
	< >		
	4.4 < > 5.9	<u>Sand (SW)</u> 80% fine grained sand, 10% medium grained sand (same material and shape as 0-3.4 ft) 5% coarse grained sand (same material and shape as 0-3.4) trace fine gravel and fines upward fining, coarse sand @ 5.9 feet medium gray, loose, stiff, micaceous, moderately sorted	
	< >		
	5.9 < > 8.4	<u>Sand (SW)</u> 90% fine grained sand, 5% medium grained sand (same material and shape as 4.4-5.9), trace fine gravel, trace fines medium gray, loose, stiff, micaceous	
	< >		
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/11/06

Samplers: JB/SC/BJ/DD

Station Location: Moving along 1st row of DMND (Ex pier headline) in dredge area

to proposed /
Station ID: P0V-08

Coordinates:

Latitude/Northing	Longitude/Easting
$45^{\circ} 39.7161^N$	$122^{\circ} 45.7131^W$

Measured Water Depth: -32.2 (Leadline / Sounder / Other)

Vertical Datum: + 2.84 (MLLW / MLW / Other + CRD @ 1/30)

Mudline Elevation: -29.36

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: ~~9'6"~~ 9'6" = 9'7"

Percent Recovery 76 (%)

Core/Drive Comments: 4' 5" Open / Med. Sand with some fines and ^{fine to} some Coarser materials / not well sorted / very wet core - lots of water

SEDIMENT CORE PROCESSING:

Processors: MS Marshall, ASernes

Date: 10/12/06 post

Geologist: M.S. Marsh II

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/11/06Samplers: JB/SC/BT/DDStation Location: Downstream end of dredge area
2nd column of DMWU (2nd from downstream end of dredge area) Station ID: PDV-09

Coordinates:

13°47'

Latitude/Northing	Longitude/Easting
<u>45° 39.7082 N</u>	<u>122° 45.7398 W</u>

Measured Water Depth: 45' 0" - 38' 0" (Leadline / Sounder / Other _____)Vertical Datum: +2' 0" (MLLW / MLW / Other +CRD 1345)Mudline Elevation: -35.98Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 10"Percent Recovery 70 (%)Core/Drive Comments: 5' 2" fence to Open / Med. sand, wood chips on surface of
The core and in core base

SEDIMENT CORE PROCESSING:

Date: 10/12/06 2 feet2 core sections
0-4' 4"-8' 5"Processors: ASOMES/MarshallGeologist: M.S. Marshall, II

Core Section(s)	Depth (cm)	Core Profile/Comments	Sample ID(s)/Info.
	0 < 8.2	Sand 98% fine grained sand, 2% medium grained sand lenses, loose, Stiff, Micaceous, medium grained sand consists of lithic and mineral fragments (cinder+brash) Feldspar, + Quartz + mica) surrounded trace fine gravel consist of lithic fragments rounded to subrounded	
	< >	4 inch lense of organic debris w/ wood fragments at 6 feet below surface/mudline	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/11/06Samplers: JB/SC/BT/DDStation Location: Downstream end of project site -
3rd low of DMIL from proposed pier
headline. Station ID: POV-10

Coordinates:

75.21 Trx
15:51 Core 2

Latitude/Northing	Longitude/Easting
<u>45° 39.6999 N</u>	<u>122° 45.7566 W</u>

Core 2Measured Water Depth: -34.8' (Leadline / Sounder / Other _____)Vertical Datum: +1.49 (MLLW / MLW / Other I CTD)Mudline Elevation: -33.31Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 3"Percent Recovery 65 (%)Core/Drive Comments: Poor recovery on tray 1/Core 2 - 5'9" Open / fine to
before / lots of water in core material /

SEDIMENT CORE PROCESSING:

Date: 10/12/062 core sections
0-4'/ 4'-7'10"Processors: ASOMES, MS MarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>) <i>part</i>	Core Profile/Comments	Sample ID(s)/Info.
0 < > 7.5	< >	Sand 98% fine grained Sand, 2% fine gravel, gravel consists of lithic fragments, rounded loose, stiff, micaceous, medium gray	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06

Samplers: JB/SC/BJ/DD

Station Location:

~~POV - II~~ Downstream end of project site
in the Columbia River

Station ID: PCV-11

Coordinates:

Latitude/Northing	Longitude/Easting
$45^{\circ} 39.6405^{\prime\prime} N$	$132^{\circ} 45.7817^{\prime\prime} W$

© 11:31

Measured Water Depth: ~ 37.3 (Leadline / Sounder / Other)

Vertical Datum: +3.09 (MLLW / MLW Other +CRD)

Mudline Elevation: -34.21

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 8' 9"

Percent Recovery 69 (%)

Core/Drive Comments: 5'3" Open / material in core nose - Fine sand not as coarse as material in top of core

SEDIMENT CORE PROCESSING:

Date: 10/13/06

-Feet

2 Core Sections
0-4' 4-8' 4"

Processors: A Somes M Marsha II

Geologist: MS Marshall

Core Section(s)	Depth (^{ft})	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 4.2	Sand (SW) <u>90% fine grained sand, 5% medium grained sand</u> , subrounded, composed of lithic and mineral fragments (cinder + Basalt/Quartz + feldspar + mica) micaceous, 5% to trace fine coarse grained sand and fine gravel Subrounded to subangular ~ lithic fragments trace fines, poorly sorted, medium gray, loose, stiff	
	< >		
	< >		
4.2	4.5	Sand with gravel (SW) <u>80% fine grained sand, 10% medium grained sand</u> , consists of lithic and mineral fragments (cinder + Basalt/Quartz + feldspar + mica) micaceous, subrounded; 5% coarse grained sand, consist of same material that comprise medium grained sand material, 5% fine gravel, lithic (intrusive and extrusive) fragments, rounded to subangular, poorly sorted, medium gray, loose, stiff	
	< >		
	< >		
4.5	< > 5.2	Sand (SW) same as 0 to 4.2 feet	
5.2	5.6	Sand (SW) <u>70% fine grained sand, 25% same medium grained sand</u> , consists of similar ^{fine} shape material as described above; grades downward to coarser material, 5% coarse grained sand similar material and shape as described above alternating thin beds of medium to fine grained sand 7.5 - 5.8, poorly sorted, medium gray, loamy, stiff	Trace gravel Subrounded to subangular Trace fines
	< >		
	< >		

5.6 - 7.5

Sand (SW) 90% fine grained sand, 10% medium grained sand. Sands for material and shape as described above; downward scabbing trace a ravel.

6.6-7.5, broad leaf, subang.
poorly inserted, medium gray
Page 4 of 1000, stiff
19

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ/DIDStation Location: POV - 12 Downstream end of project site in the Columbia RiverStation ID: POV - 12

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.6679N</u> 6694 N = Attempt 2	<u>122° 45.8422 W</u> 8469 W - Core Attempt 2 @ 13:58

Measured Water Depth: -49' 9" (Leadline / Sounder / Other _____)Vertical Datum: + 2.43 (MLLW / MLW / Other) ± CRD @ 14:00Mudline Elevation: -47.37'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 6' 11"Percent Recovery 55 (%)Core/Drive Comments: note water depth was 49' 9" for both core attempts
7' 1" Open / Fine-med to coarse sand/small, sub-angular gravel

SEDIMENT CORE PROCESSING:

Date: 10/13/062 core sections,
0-4', 4-6.7"Processors: ASomes, MSHarshallGeologist: MSHarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0	< > 2.25	Sand (SP) 95% fine grained sand, 5% medium grained sand + trace fines, medium grained sand consists of lithic and mineral fragments, (cinder) basalt/Quartz+Feldspar+minerals) micaceous, subrounded to subangular trace coarse grained sand, subrounded to subangular lithic, moderately sorted, medium gray, loose, stiff	
	< >		
2.25	< > 3.2	Sand (SW) 75% fine grained sand 15% medium grained sand, 5% coarse grained sand, trace fine gravel + trace fines. Sand consists of same material and shape as 0-2.25, gravel is lithic and subrounded medium gray, loose, stiff, poorly sorted, wood debris micaceous	
	< >		
3.2	< > 4.6	Sand (SP) 90% fine grained sand, 10% medium grained sand, sand consists of same material and shape as observed @ 2.2-3.2, medium gray, loose, stiff moderately sorted, micaceous	
	< >		
4.6	4.1	Sand (SW) 75% fine grained sand, 10% medium grained sand, 10% coarse grained sand, trace fine gravel, trace fines, sand and gravel consists of same material and shape as observed @ 2.2-3.2	
	< >		
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10 / 17 / 06Samplers: JB/SC/BJ/DDStation Location: Moving into 1st row of DMRA (next to proposed pier headline) in dredge areaStation ID: POV-13

Coordinates:

(1132

Latitude/Northing	Longitude/Easting
<u>45° 39.6596 N</u>	<u>122° 45.6705 W</u>

Measured Water Depth: -31.1'

(Leadline / Sounder / Other _____)

Vertical Datum: +0.53 (MLLW / MLW (Other) + CRO C 1130)Mudline Elevation: -30.57'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 11"Percent Recovery 78 (%)

Core/Drive Comments: 34 ft Open / 4' 1" Open / medium sand - thin (1-2mm) layer fine (silt) in surface of core / medium sand at cut between sections B+C and again at cut between C+D and coarse material in core base with medium sand - Not as much water in this core as in previous cores 10/17/06

SEDIMENT CORE PROCESSING:

Date: 10 / 18 / 06

3 Core Sections

0-4' / 4'-8' / 8'-9' 6"

Processors: ASomes MSMarshallGeologist: MSMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	< > 5.9	Sand (SP) 75-100% Fine grained sand, 0-25% medium grained sand, 0-25% fines. Medium grained sand consists of lithic and mineral fragments (calcareous basalt/quartz, feldspar, mica) surrounded, medium gray, loose, stiff, micaceous, moderate to well sorted	Logging conducted according to LWG Guidelines for sediment sampling
	< >		
	5.9 < > 9.1	Sand (SP) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% fines, 0-25% fine gravel. Medium grained sand consists of same material and shape as above, coarse grained sand is lithic and subangular, gravel is lithic (gravel?) and surrounded to subangular, medium gray, loose, stiff, micaceous, well sorted, alternating thin beds of medium and coarse grained sand in between beds (5-20cm) off fine grained sand, gravel is found mostly with coarser sands,	(3-5cm)
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/JBJ/DDStation Location: Moving, Down stream in 2nd Row of PDMU, In dredge area (2nd row from proposed pier headline) Station ID: POV - JBT 14Coordinates: 10°59'

Latitude/Northing	Longitude/Easting
<u>45°32.6516 N</u>	<u>122°45.18900 W</u>

Measured Water Depth: - 33.5' (Leadline / Sounder Other Hose mark)Vertical Datum: + 0.60' (MLLW / MLW Other ± CRD)Mudline Elevation: - 32.9Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 8" 7"Percent Recovery 60 (%)Core/Drive Comments: 4' 5" Open / Medium sand - 1cm layer fines - brown silt / on surface of core / medium sand + med. ab. cont between A + B core sections / material appears dryer than previous cores - not as much water / core nice - med. sand with various material mixed in

SEDIMENT CORE PROCESSING:

Date: 10/18/06

2 core sections

0-4' 1/4" - 4' - 9' 2"Processors: ASomes, TawGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 6.3	Sand (SP) 75-100% fine grained sand 0-25% fines, medium gray, loose, stiff micaceous, well sorted	Conducted in accordance to LWG Guidance for sediment sampling, modified ASTM
	6.3 < > 8.1	Sand (SP) 75-100% fine grained sand 0-25% medium grained sand, 0-25% fines, medium grained sand consists of lithic and mineral fragments (cinder/basalt Quartz, feldspar, mica) subrounded to subangular, alternating thin beds of (3-5cm) medium grained sand inbetween beds (5-20cm) of fine grained sand, contacts are sharp, medium gray, loose, stiff micaceous well sorted	
	8.1 < > 9.8	Sand (SW) 75-100% medium grained sand 0-25% 25-50% fine grained sand, trace fines, trace coarse grained sand trace fine gravel, medium grained sand consists of lithic and mineral fragments of same material and shape as above, coarse grained sand and gravel are lithic and subangular to subrounded, medium gray, loose, stiff micaceous, moderately poorly sorted	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06

Samplers: JB/SC/BJ/PD

Station Location: Moving inshore to 3rd near of PMML
in dredge area (3rd now from outside (offshore) edge of dredge area) Station ID: PON PON-15

Coordinates:

Latitude/Northing	Longitude/Easting
45° 39.6428 N	122° 45.7120 W

Measured Water Depth: -35.0 (Leadline / Sounder / Other) Hose mark

Vertical Datum: +0.62 (MLLW / MLW / Other) TCD @ 11:30

Mudline Elevation: -34.38

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 10' 3"

Percent Recovery 81 (%)

Core/Drive Comments: 3' 9" Open/Lots of small wood fragments on surface of core - medium to medium sand / same sand cut and between core sections A & B and core nose / also some coarser material - sand and small gravel (worn + rounded) at cut and in core nose / same sand and coarse mixture at cut between B+C sections

SEDIMENT CORE PROCESSING:

3 core sections Processors: ASOMES, MS Marshall

Date: 10/17/06 Cet

0-4' 4"-8' 8"-9' 10"

Geologist: NS Marshall

Core Section(s)	Depth (<>)	Core Profile/Comments	Sample ID(s)/Info.
0	< > 6	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand, trace fine gravel, medium grained sand consists of lithic and mineral fragments (cinder, basalt) / Quartz, feldspar, mica surrounded; gravel consists of lithic subangular fragments (granite/basalt), medium gray, loose, stiff, micaceous, moderate sorting	* Logging conducted according to LWS sediment sampling guidelines modified ASTM
6	< > 6.2	Sand (SP) 75-100% medium grained sand, 0-25% fine grained sand, trace fines, medium grained sand consist of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous, well sorted	
6.2	< > 8.7	Sand (SP) 50-75% fine grained sand, 25-50% medium grained sand, trace fine gravel, trace fines, medium grained sand consists of lithic and mineral fragments of same material and shape as 0-6, gravel consists of lithic (granite?) reddish brown phaneritic) subangular fragments, medium gray, loose, stiff, micaceous, well sorted, alternating thin beds of medium grained sand in between beds of fine grained sand (20-40cm)	
8.7	< > 9.4	Sand (SW) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% Coarse grained sand, trace fine gravel, trace fines, medium grained sand consists of same material and shape as 0-6, coarse grained sand consists of lithic (cinder, basalt, granite?) subangular fragments, gravel are lithic subangular, medium gray, loose, stiff, micaceous, poorly sorted	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06

Samplers: JB/SC/BJ/DD

Station Location: Moving downstream in the 2nd row of DMNU from outside (offshore) edge of the dredge area Station ID: P0476 P0V-1eCoordinates:
10° 56'

	Latitude/Northing	Longitude/Easting
	45° 39.6317 N	122° 45.7429 W

Measured Water Depth: ~ 39.0' (Leadline / Sounder Other Hose Mark)

Vertical Datum: +0.48 (MLLW / MLW / Other ± CRD @ 11:00)

Mudline Elevation: ~ 38.52

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 7' 7"

Percent Recovery 60 (%)

Core/Drive Comments: 6' 5" Open/Hit harder material between -5 and -6 ft. and again at -11 ft / medium fine to medium sand with 1-2 mm layer of brown silt on surface of core / same sand with much more coarse material (coarse sand + gravel) at cut between core sections A + B / same description for material in core nose.

SEDIMENT CORE PROCESSING:

Date: 10/17/06

2 core sections Processors: ASomers, ISaul, MShMarshall

Geologist: MShMarshall

Core Section(s)	Depth (ft)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 3.2	Sand (SW) 75-100% Fine grained sand, 0-25% medium grained sand, 0-25% fines, micaceous, medium gray, loose, stiff, medium grained sand consists of lithic and mineral fragments (limestone/basalt, quartz, feldspar, mica) surrounded, moderate to poorly sorted	* logging conducted in accordance to LWG Sediment Sampling Guidance, Modified ASTW1
	3.2 < > 4	Sand (SW) 50-75% fine grained sand, 25-50% medium grained sand, trace coarse grained sand medium grained sand consists of lithic and mineral fragments of same material and shape as above, coarse grained sand consists of lithic fragments (granite/basalt, subangular, poorly sorted)	
Large brick fragment @ 4 feet	4 < > 5.6	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand, micaceous, medium gray, loose, stiff (soggy?) medium grained sand consists of lithic and mineral fragments of same material and shape as above, moderate to well sorted	
	5.6 < > 6.9	Sand (SW) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% fines, micaceous medium gray, loose, stiff medium grained sand consists of lithic and mineral fragments of same material and shape as above, more alternating thin beds (~10 cm) of fine to medium grained sand!	
		Fine grained beds (10-30cm) dominate, contacts are gradational	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ/DDStation Location: Downstream end of project, 15' now of DMWU
from outside edge of dredge area
(offshore)Station ID: POV-17

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.6141 N</u>	<u>122° 45.7982 W</u>

Measured Water Depth: -48.2' (Leadline / Sounder / Other _____)Vertical Datum: +2.22' (MLLW / MLW / Other TCD @ 14:45)Mudline Elevation: -45.98'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 7' 0"

Percent Recovery _____ (%)

Core/Drive Comments: 7' 0" Open / Coarse sand, in core nose.

SEDIMENT CORE PROCESSING:

Date: 10/16/060-4.4'/4.4'-6x3"
2 core sectionsProcessors: ASOMES, MSMarshallGeologist: MSMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
		* Change logs to measure sediment distribution per LWD guidance for sediment sampling modified As track	
	0 < > 4	Sand (SW) 75% fine grained sand, 50-25% medium grained sand, 50-25% fines, medium grained sand consists of lithic and mineral fragments (cinder + basalt / quartz, feldspar, mica). Subangular, micaceous, medium gray, loose, stiff, poorly sorted	
	< >		
	< >		
	4 < > 5.6	Sand (SW) 50-75% fine grained sand, 25-50% medium to coarse grained sand, 25-50% fines, trace gravel, medium grained sand consists of lithic and mineral fragments, coarse grained sand and fine gravel are lithic, subrounded to subangular, micaceous, medium gray, loose, stiff, poorly sorted	
	< >		
	< >		
	5.6 < > 6.6	Sand (SW) 50-75% medium grained sand, 25-50% fine grained sand, 25-50% fines, trace coarse grained sand, micaceous, medium gray, loose, stiff, medium grained sand consists of same material and shape as 0-4 feet coarse grained sand consist of subangular lithic fragments	
	< >		
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SL/BJ/DDStation Location: Moving upstream sailing in river 12' DMMH (next to proposed pier headline) in dredge area Station ID: POV-18Coordinates: 12:08

Latitude/Northing	Longitude/Easting
<u>45° 34.5959 N</u>	<u>122° 45.6201 W</u>

Measured Water Depth: -28.8' (Leadline / Sounder / Other _____)Vertical Datum: + 0.57' (MLLW / MLW / Other) I CRD @ 12:15Mudline Elevation: -28.23'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 9"Percent Recovery 77 (%)Core/Drive Comments: 5' 3" Open / medium sand with thin layer fine silt (1-2mm) on surface of core / Medium sand with coarser material - coarse sand + small gravel at cut between A & B core sections / material in core were the same no above.

SEDIMENT CORE PROCESSING:

Date: 10/18/06

2 core sections

0-4'/4'-8' 4"

Processors: Ascomes, MShanahanGeologist: MS Marisha

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.6	Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained sand Medium gray, loose, stiff, micaceous Moderate to well sorted, wavy	* Logging conducted according to LWG guidance for sediment sampling
	2.6 < > 4	Sand (SW) 75-100% fine grained sand, 0-25% medium grained sand, 0-25% fines 0-25% wood debris, medium grained sand consist of lithic and mineral fragments (clay) basalt/quartz, feldspar, mica) subrounded to subangular, medium gray, loose, stiff micaceous, poorly sorted	
	4 < > 5.6	Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained sand consist of lithic and mineral fragments of same material and shape as above medium gray, loose, stiff, micaceous well sorted	
	5.6 < > 7.9	Sand (SP) 50-75% medium grained sand, 0-25% fine grained sand, 0-25% fines, trace coarse grained sand, medium grained sand consists of same material and shape as above (2.6-4 feet), coarse grained sand consists of lithic, subrounded to subangular fragments, medium gray, loose, stiff, micaceous sharp contact with layer above	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/RJ/DDStation Location: Moving downstream in 2nd row of DMMH
(2nd row from proposed pier heel line) bin
dredge areaStation ID: POV-19

Coordinates:

10:30

Latitude/Northing	Longitude/Easting
$45^{\circ}39.3903^{\prime}$ N	$122^{\circ}45.6359^{\prime}$ W

Measured Water Depth: 31.9' (Leadline / Sounder / Other _____)Vertical Datum: +0.73' (MLLW / MLW / Other I C.R.D. (C. 10:30))Mudline Elevation: -31.17'Estimated Penetration: 12.8"Refusal: NoneTotal Core Length: 5 1/2" 8' 4"Percent Recovery 66 (%)Core/Drive Comments: 5 1/2" open / med sand with coarser sand & small
gravel - especially in core base Rate 1cm² layer - fine/brown
silt on surface of core.

SEDIMENT CORE PROCESSING:

Date: 10/18/06Processors: ISomer, T. Sait
0-4' 1/4"-7 1/2"Geologist: MS/Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 < > 4.2	< >	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand, medium grained sand consists of lithic and mineral fragments (cinder, basalt/quartz, feldspar mica). Subrounded, medium gray, loose, stiff, micaceous, moderate to well sorted.	Logging conducted in accordance with LWG Sediment Sampling guidance modified ASTM
4.2 6.3	< >	Sand (SP) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% fines, trace coarse grained sand, medium grained sand consists of lithic and mineral fragments of same material and shape as above, alternating thin beds (5-10 cm) of medium grained sand in between beds of (10-20 cm) fine grained sand, contacts are sharp, beds are at an angle from the horizontal, medium gray, loose, stiff, micaceous, moderate to well sorted.	
6.3 < > 7.5	< >	Sand (SW) 50-75% medium grained sand, 25-50% fine grained sand, 0-25% fines, trace coarse grained sand, trace fine gravel, medium grained sand consists of lithic and mineral fragment of same material and shape as above, coarse grained sand consist of lithic subrounded and subangular fragments, moderately sorted, contact gradational from layer above, medium gray, loose, stiff, micaceous, moderate to well sorted.	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06Samplers: JB/SC/BJ/DDStation Location: moving upstream in 3rd run of DMNU from outside (offshore) edge of dredge area Station ID: P0V-20Coordinates: (2:14)

Latitude/Northing	Longitude/Easting
<u>45°39.5834N</u>	<u>122°45.6565W</u>

Measured Water Depth: - 34' 4" (Leadline / Sounder Other) @ 1215Vertical Datum: + 1.09 (MLLW / MLW / Other) ± CRDMudline Elevation: - 33.31Estimated Penetration: 12' 8"Refusal: NineTotal Core Length: 8' 4"Percent Recovery 66 (%)Core/Drive Comments: 5' 8" Open / Medium Sand with some fine sand, & some coarse sand.

SEDIMENT CORE PROCESSING:

Date: 10/17/062 core sections
0-4' 4"-7' 2"Processors: MSMarshall ASomasGeologist: MSMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 < > 5.3		<u>Sand (SP)</u> 75-100% fine grained sand, 25% fines, trace medium grained sand, medium gray, loose, stiff, micaceous, well sorted	
5.3 < > 6.2		<u>Sand (su)</u> 50-75% fine grained sand, 0-25% medium to ^{trace} coarse grained sand, 0-25% fines, 0-25% fine gravel, medium grained sand consists of lithic and mineral fragments (cinder, basalt, Quartz, feldspar, mica) sub rounded to subangular, coarse grained sand predominately lithic and subangular, gravel is lithic and subangular, micaceous, medium gray, loose, stiff	
< >			
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< >			
6.2 7.3		<u>Sand (SP)</u> 50-75% fine grained sand, 25-50% medium grained sand, 0-25% medium grained sand consists of some fines, medium grained sand, 0.5-5.3-6.2 feet, medium material and sharp 0.5-5.3-6.2 feet, medium gray, loose, stiff, micaceous, alternating thin beds, 10-20 cm of medium grained sand between beds, 30-50 cm of fine grained sand (contacts are sharp, well sorted)	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06Moving downstream in 2nd run of DMMS
Station Location: from outside edge of the dredge area.Samplers: JB/SC/BJ/DDStation ID: POV-21 POV-21Coordinates:
10:11

	Latitude/Northing	Longitude/Easting
	<u>45° 39.5756 N</u>	<u>122° 45.6811 W</u>

Measured Water Depth: - 37.5' (Leadline / Sounder Other Hose Mark)Vertical Datum: + D.50 (MLLW / MLW Other CKD @ 10:15)Mudline Elevation: - 37.0'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 4"Percent Recovery 66 (%)Core/Drive Comments: 5' 8" Open / Medium sand, some small gravel, wood fragments at surface of core / lots of water in sample - very soupy at the cuts between core sections A + B and B and the core nose.

SEDIMENT CORE PROCESSING:

Date: 10/17/062 core sections Processors: ASons, ISaul, MShawell
0-4'/4'-7' 11"Geologist: MShawell

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 4.4	Sand (SP) 75-100% finegrained sand, 0-25% fines, trace medium grained sand, consist of lithic and mineral fragments (cinder+basalt/Quartz, feldspar, mica) Subangular to subangular, medium gray, loose, stiff, micaceous	
	< >		
	4.4 4.9	Sand (SW) 50-75% finegrained sand, 25-50% medium grained sand 0-25% fines, medium grained sand consists of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous	
	< >		
	4.9 7.4	Sand (SP) 50-75% finegrained sand, 25-50% medium grained sand, 0-25% fines, and consists of lithic and mineral fragments same material and shape as above, alternating thin beds of medium grained sand to fine grained sand contacts are sharp, medium gray, loose, stiff, micaceous	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC / BJ / DDStation Location: Moving upstream along outside edge
of dredge area - at prior siteStation ID: POV-22

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.5561 N</u>	<u>122° 45.7243 W</u>

@ 15:32

Measured Water Depth: -45.08' (Leadline / Sounder / Other _____)Vertical Datum: +2.07' (MLLW / MLW / Other I CRD C) 15:30Mudline Elevation: -43.01'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 9"Percent Recovery 77 (%)Core/Drive Comments: 4' 3" Open / fine → med → coarse grained sand + wood chips
core nose

SEDIMENT CORE PROCESSING:

Date: 10/16/06Processors: HSCMPS MS Marshall
0-4' 4.0 = 6.9
0-4.4' 4.4' - 6.3' Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
*	changed logs to measure sediment distribution per LWG sediment sampling guidance modified ASTM		
0	< > 1.6	Sand (SW) 75% Fine grained sand, 0-25% medium grained sand consists of lithic lithic and mineral fragment (cinder + basalt / quartz, feldspar, mica) subrounded, micaceous, medium gray, loose, stiff, poorly sorted	
1.6	3.1	Sand (SW) 50-75% medium grained sand, 25-50% fine grained sand, 25-50% fines, trace coarse grained sand, medium grained sand consists of same material and shape as 0-1.6, subrounded to subangular, trace fine gravel, subangular, lithic, micaceous medium gray, loose, stiff, grain + basalt	
3.1	8.4	Sand (SP) 75% fine grained sand, trace medium grained sand, 50-25% 50-25% fines medium gray, loose, stiff	
8.4	< > 8.7	Sand (SW) 75%, 50-75% fine grained sand, 25-50% medium grained sand 25-50% coarse grained sand, trace fines, 25% wood debris, medium sand, and coarse grained sand consist of same material and shape as above	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/BJ/DDStation Location: Moving upstream in 1st new VJ DMVII
(from pier headline) in dredged area
proposedStation ID: POV-23Coordinates: 13°23'

Latitude/Northing	Longitude/Easting
<u>45°39.5307N</u>	<u>122°45.5719W</u>

Measured Water Depth: - 27.1' (Leadline / Sounder / Other _____)Vertical Datum: + 1.15' (MLLW / MLW / Other ± CRD @ 13°15')Mudline Elevation: - 25.95'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 2"Percent Recovery 72 (%)Core/Drive Comments: 4' 10" Open / Med-fine to Medium sand and thin layer of
fine silt (1-2 mm) brown on surface of core / Med-fine to fine sand not
seen between A + B core sections /

SEDIMENT CORE PROCESSING:

Date: 10/19/06Processors: A Somes, T Sonne0-4' / 4-8' 10"Geologist: M S Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0	< > 5.4	Sand (SP) 75-100% fine grained Sand, 0-25% fines, 0-25% trace medium grained sand, medium grained sand consist of lithic and mineral fragments (cinder, basalt, Quartz, Feldspar, mica) subangular medium gray, loose, stiff, micaceous, moderate to well sorted	* logging conducted according to LW & Sediment sampling Guidance Modified ASTM
5.4	< > 6.3	Sand (SW) 50-75% fine grained sand 0-25% medium grained sand, 0-25% fines 0-25% fine gravel, medium grained sand consist of same material and shape as above fine gravel consists of lithic fragments subangular, medium gray, loose, stiff micaceous, poorly sorted	
6.3	< > 8.16	Sand (SP) 75-100% fine grained Sand, 0-25% medium grained sand 0-25% fines, medium grained sand consist of lithic and mineral fragments of same material and shape as above medium gray, loose, stiff, micaceous moderate to well sorted	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/BJ/DDStation Location: moving downstream in 2nd row of DMNU
from proposed pierheadline) in dredge areaStation ID: POV-24Coordinates:
10:01

Latitude/Northing	Longitude/Easting
<u>45°39.5258N</u>	<u>122°45.5887W</u>

Measured Water Depth: - 29.8' (Leadline / Sounder / Other _____)Vertical Datum: + 0.89' (MLLW / MLW / Other ± CRD) 10:00Mudline Elevation: - 28.91'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 4"Percent Recovery 66 (%)Core/Drive Comments: 5' 8" Open / Med sand + noted thin layer of silt/fines - blue-brown
on surface of upstream core (cored 1/4" above). The 8, 9, 10, 11, 12 DMNU now + in shore
firm outer edge of dredge area - layer is ~ 1 mm in depth

SEDIMENT CORE PROCESSING:

Date: 10/19/062 core sections
0-4', 4'-7' 11"Processors: ASomes/IsawtGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	<u>0 < > 5.4</u>	<u>Sand (SP) 75-100% fine grained sand 0-25% fines, wood debris @ top medium gray, loose, stiff, micaceous well sorted</u>	<u>Logging conducted in accordance to LWG Sediment sampling Guidance Modified ASTM</u>
	<u>5.61 < > 6.4</u>	<u>Sand (su) 50-75% fine grained sand 25-50% fines, 0-25% medium grained 0-25% fine sand, medium grained sand consist of lithic and mineral fragments (cinder, basalt/Quartz feldspar, mica) surrounded to subangular medium gray, loose, stiff, micaceous, gravel consist of lithic subangular fragments poorly sorted</u>	<u>gravel</u>
	<u>6.4 < > 7.4</u>	<u>Sand (SP) 50-75% fine grained sand, 0-25% medium to coarse grained sand 0-25% fines, medium grained sand consist of same material and shapes above, Alternating thin beds (1-5cm) of medium grained sand in between beds (0-20cm) fine grained sand, contacts are sharp, beds are tilted at an angle to horizontal, medium gray, loose, stiff, micaceous, well sorted</u>	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06

Samplers: JB/SC/BJ/DD

Station Location: moving upstream in 3rd row of DMH4
from outside edge of project site.

Station ID: PDV-25

Coordinates:
13.11

Latitude/Northing	Longitude/Easting
45°39.5184 N	122°45.6063 W

Measured Water Depth: ~32.5' (Leadline / Sounder / Other _____)

Vertical Datum: +2.02 (MLLW / MLW / Other _____) @ 1315

Mudline Elevation: -30.48'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 9' 2"

Percent Recovery 72 (%)

Core/Drive Comments: 4'10" Open / Medium Sand - some fine sand & coarse sand
Core nose the same but more coarse material / less fine sand.

SEDIMENT CORE PROCESSING:

Date: 10/18/06

Core Sections Processors: ASomes, MSMarshall
0-4', 4-8'10" Geologist: MSMarshall

feet

Core Section(s)	Depth (</>) feet	Core Profile/Comments	Sample ID(s)/Info.
0 < > 4.5	< >	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand. Medium grained sand consists of lithic and mineral fragments (cinder & basalt), quartz, feldspars, mica. Subrounded, medium gray, loose, stiff, micaceous.	* Logging conducted according to LWG Guidance for Sediment Sampling
4.5 8.2	< >	Sand (SP) 50% - 75% fine grained sand, 25-50% medium grained sand, 0-25% fines, trace coarse grained sand. Medium grained sand consists of lithic and mineral fragments. Same material and shape as above, coarse grained sand is lithic and subangular, medium gray, loose, stiff, micaceous, alternating thin beds (5-15 cm) of med to coarse in between beds of fine grained sand (20-30 cm)	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/BT/DDStation Location: Moving downstream in 2nd now
of DMNI - from outside (offshore) edge
of project site.Station ID: PCV-26

Coordinates:

14:45

Latitude/Northing	Longitude/Easting
<u>45° 39.5093' W</u>	<u>122° 45.6309' E</u>

Measured Water Depth: 38.7' (Leadline Sounder / Other _____)Vertical Datum: +2.45 (MLLW / MLW / Other ICRD @ 14:45)Mudline Elevation: -36.25'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 3"Percent Recovery 73 (%)Core/Drive Comments: 4' 9" Open/Med Sand - Some coarser material in core
surface / material at cut between A+B section primarily fine
to medium sand & same in core nose plus some coarse grains.

SEDIMENT CORE PROCESSING:

Date: 10/13/06

2 Core Sections

0-4.4-8' 10"Processors: ASomes, ISGA, MMarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 4.5	Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained sand medium gray, loose, stiff, micaceous, consists of lithic and mineral fragments (cinder, breccia/quartz feldspar, mica)	As logging conducted in accordance to FW & sediment sampling guidance. Modified ASTM
	4.5 < > 6.1	Sand (sw) 50-75% fine grained sand, 0-25% medium to coarse grained sand, trace fine gravel 0-25% fines, medium fine grained sand consists of lithic and mineral fragments, subrounded, coarse grained sand consist of lithic subrounded to subangular fragments, gravel consist of lithic subangular fragments medium gray, loose, stiff, micaceous, poorly sorted	
	6.1 < > 8.2	Sand (SP) 75-100% fine grained sand, 0-25% medium grained sand 0-25% fines, medium grained consist of lithic and mineral fragments, same shape as 0-4.5 feet, thin bed of medium grained sand @ 6.4, 6.9, 7.5, 7.7, ← micaceous, medium gray, loose, stiff, moderately to well sorted, Alternating thin beds of fine to medium grain sand	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BJ/DDStation Location: Moving toward center of project site along outside BMH in the dredge area Station ID: POV-27

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.4931 N</u>	<u>122° 45.6739 W</u>

© 16:09Measured Water Depth: -44.6' (Leadline) Sounder / Other _____Vertical Datum: + 1.92' (MLLW / MLW Other + CRD) © 16:15Mudline Elevation: -42.68'Estimated Penetration: 12' 8" Refusal: NoneTotal Core Length: 8' 8" Percent Recovery 68 (%)Core/Drive Comments: 5' 4" Open / med-coarse sand / Some gravel in core nose

SEDIMENT CORE PROCESSING:

Date: 10/10/062 core sections
0-4'3" / 4'3"-8'4"Processors: ASomes, MSMarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
* changed logs to the		Quartile Size distribution per LWD sediment sampling guidance *	
0 < > 5.1	< >	Sand (gw) > 75% Fine grained sand, 0-25% medium grained sand, medium grained sand consists of lithic and mineral fragments (cinder + basalt / quartz, feldspar, mica) surrounded by calcareous, 0-25% fines, medium gray, loose, stiff, poorly sorted	
5.1 < > 5.7	< >	Sand (sw) 50-75% fine grained sand, 20-50% medium grained sand, consists of same shape and material as 0-5.1 feet, 0-25% coarse grained sand, consist of lithic fragments, subrounded to subangular, + trace fine gravel, lithic, subrounded to subangular, medium gray, loose, stiff	
5.7 < > 8.0	< >	Sand (sw) 50-75% fine grained sand, 50-75% medium grained sand, medium grained sand consists of same material and shape as 5.1-5.7 feet, medium gray, loose, stiff, alternating thin beds of fine to coarse grained sand	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/BJ/DDStation Location: Moving upstream in 1st nar of DMN II
in dredge run (1st nar from proposed pierhead
(line).Station ID: PDV-28Coordinates:
13°51'

Latitude/Northing	Longitude/Easting
<u>45°39.465N</u>	<u>122°45.522W</u>

Measured Water Depth: -28.5' (Leadline / Sounder / Other _____)Vertical Datum: +1.61' (MLLW / MLW / Other) ± CRD @ 13'45"Mudline Elevation: -26.42'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 1"Percent Recovery 64 (%)Core/Drive Comments: 5' 11" Open / Medium Sand & thin layer of brown silt
(f 2mm) on surface of core / Not fine to medium sand at cut between
core section A + B / Same material in core tube.

SEDIMENT CORE PROCESSING:

Date: 10/19/06 feet2 core sections
0-4' / 4'-7'8"Processors: A Somes / SaulGeologist: MS / Marshall

Core Section(s)	Depth (</>in)	Core Profile/Comments	Sample ID(s)/Info.
	0 <> 5.5	Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained sand medium gray, loose, stiff, micaceous, medium gray sand; 5 lithic and mineral fragments (cinder + basalt / quartz, feldspar, mica) subrounded, well sorted	* logs inconcluded by incoherence to W/G sediment. Sampling guidance modified ASTM
	5.5 <> 7.4	Sand (SP) 50-75% fine grained sand 0-25% 0-25% medium grained sand, 0-25% fines, medium grained sand consist of lithic and mineral fragments of same materials and shape as above, medium gray, loose, stiff, micaceous, medium grained sand in thin beds (3-10 cm) in between beds (3-20 cm) of fine grained sand, alternating beds, at an angle from horizontal	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number:

SEDIMENT CORE SAMPLING:

Date: 10/17/06

Samplers: JB/SC/BJ/DD

Station Location: moving down stream in 2nd row (from proposed
headline) of Ditch in dredge area Station ID: P0V-29

Coordinates:

Latitude/Northing	Longitude/Easting	
45°39.4574 N 151°45.5376 W	151°45.5376 W	Attempt #1
45.61 N 151.75 E	5357 (W) 2ND	Leadline / Sounder / Other House mark End attempt

Measured Water Depth: 29.9 ~~30.5~~ (Leadline Sounder Other Hose mark Dredge attempt, >30.5)

Vertical Datum: +1.15' (MLLW / MLW / Other) ± 30.5 I CRD e-09/15

Mudline Elevation: -29.35'

f = u

Estimated Penetration: 12.8%

Refusal: None

Total Core Length: 8' 6"

Percent Recovery 67 (%)

Core/Drive Comments: Attempt #1 - 7'6" Open - leaves only 6' 6" in core tube / Attempt #2 - moving slightly away from 1st attempt location - 5'6" Open / Medium Sand with fine sand not as much coarse sand in this sample / Same material in core nose

SEDIMENT CORE PROCESSING:

2 are sections

Processors: It's a mess Tsai!

Date: 10/19/06

0-4', 4'-8' 7"

Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 <> 0.5	Sand (SP) 75-100% fine grained sand, 0-25% fines, medium gray, loose, stiff, micaceous, well sorted	Logging conducted in accordance to LWG Soil Manual sampling guidance modified ASTM
	0.5 <> 0.9	Silt (ML) 75-100% fines, moderate to low plasticity, rapid dilatancy, medium gray	
	0.9 <> 6.1	Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained sand consists of lithic and mineral fragments (cinder + basalt / Quartz, feldspar, mica) Subangular to subangular, medium gray, loose, stiff, micaceous, well to moderate sorting	
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	6.1 <> 7.4	Sand (SP) 50-75% fine grained sand 0-25% medium to coarse grained sand 0-25% fines, medium grained sand consists of lithic and mineral fragments of same material and shape as above coarse grained sand consist of lithic subangular fragments Alternating thin beds (2-5cm) of medium grained sand in between beds (10-15cm) of fine grained sand, contacts are sharp to slightly gradational, beds at slight angle, medium	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06Samplers: JB/SC/BJ/DDStation Location: mainly upstream in 3' now of DMH
from outside edge of dredge areaStation ID: POV-30Coordinates:
13°41'

Latitude/Northing	Longitude/Easting
<u>45°39'45.13N.</u>	<u>122°45.5522W</u>

Measured Water Depth: - 35.7' (Leadline / Sounder / Other _____)Vertical Datum: + 2.49 (MLLW / MLW / Other) ± CRD @ 1345Mudline Elevation: - 33.21Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 5"Percent Recovery 74 (%)Core/Drive Comments: 4' 7" Open / Med sand with some fine sand at core surface / medium sand - some fine + coarse sand also, some small, worn angular gravel

SEDIMENT CORE PROCESSING:

2 core sections
0-4', 4'-9'Processors: ASOMES, MS MarshallDate: 10/18/06Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 6.2	Sand (SP) 75-100% fine grained sand, 0-25% fines, medium gray, loose, stiff, micaceous, well sorted	logging conducted in accordance with LWG guidance sediment sampling modified ASTM
	6.2 < > 8.1	Sand (SP) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% fines 0-25% coarse grained sand, medium grained sand consist of lithic and mineral fragments (cinder+basalt/Quartz, feldspar, mica) subrounded to subangular, coarse grained sand consists of lithic subangular to sub rounded fragments, medium gray, loose, stiff, micaceous alternating thin beds (3-10cm) in between beds of (5-20cm) of fine grained sand well sorted, contacts are sharp and appear to be angled from horizontal	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/BY/DPStation Location: Marine, downstream in 2nd Row of DMMU from outside edge of project areaStation ID: PCV-31Coordinates: 14:05

Latitude/Northing	Longitude/Easting
<u>45° 39.4408 N</u>	<u>122° 45.5769 W</u>

Measured Water Depth: 38.7' (Leadline) Sounder / Other _____)Vertical Datum: + 2.65' (MLLW / MLW / Other) (CRD CRD) @ 14:00Mudline Elevation: -36.05' (13/10/06)Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 5.5"Percent Recovery 75 (%)Core/Drive Comments: 4' 6 1/2" Open/coarser material at top of core but fine → med. fine sand w/ some silt between sections A + B / mixed in core near

SEDIMENT CORE PROCESSING:

Processors: HSomps, MSMarshall,Date: 10/13/06T.SauGeologist: MSMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 6.3	Sand (SW) 50-75% fine grained sand, 0-25% medium grained sand, 0-25% fines, trace coarse grained sand, micaceous, medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	* Logging conducted according to LWS Guidance Sediment sampling modified ASTM
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	6.3 < > 8.1	Sand (SP) 75-100% fine grained sand, 0-25% fines, medium gray, loose, stiff, micaceous, well sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	8.1 < > 8.6	Sand (SP) 50-75% fine grained sand, 25-50% medium grained sand, 0-25% fines, micaceous, medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	
	< >	Medium gray, loose, stiff, medium grained sand consists of lithic and mineral surrounded fragments (cinder, basalt/quartz feldspar, mica), coarse grained sand is lithic and surrounded to subangular poorly sorted	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/12/06Samplers: JB/SC/BT/DDStation Location: Moving along outside DPMU in dredge area towards center of dredge at siteStation ID: POU-32

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.4266 N</u>	<u>122° 45.6672 W</u>

© 16:46Measured Water Depth: -43.1' (Leadline) Sounder / Other _____Vertical Datum: +1.83' (MLLW / MLW / Other) I CRD © 16:45Mudline Elevation: -41.27'Estimated Penetration: 12' 8" Refusal: NoneTotal Core Length: 8' 9" Percent Recovery 69% (%)Core/Drive Comments: 5' 3" Open / materials not same as observed in earlier samples

SEDIMENT CORE PROCESSING:

Date: 10/16/062 core sections
0-4' / 4'-8.5"Processors: Homes MS MarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
		<u>* Changed logs to more of a quartile sized distribution per LWG sediment sampling guidance</u>	
0 < > 5.4	< >	Sand(Sw) 75% Fine grained sand, 0-25% medium grained sand, medium grained sand consists of mineral and lithic fragment (Quartz, feldspar, mica) / cinder + basalt appear sub rounded, micaceous 0-25% fines, medium gray, loose, stiff poorly sorted	
5.4 < > 5.9	< >	Sand(Sw) 50-75% Fine grained sand, 25-50% medium grained sand, 0-25% coarse grained sand, medium grained sand consist of lithic and mineral fragments (cinder+basalt/quartz, feldspar+mica), sub rounded, coarse grained sand consists of lithic fragments, fine grained sub rounded sub angular/lithic, medium gray	
	< >		
5.9 < > 7.7	< >	Sand (Sw) 50% Fine grained sand, 50-75% medium grained sand, medium grained sand consists of same material and shape as above, medium gray, loose, stiff, alternating thin beds of fine to coarse material	
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/BJ/DDStation Location: Marine upstream in 1st now D MARK
in dredge area (1st now offshore proposed pier headline). Station ID: PUV-33

Coordinates:

14:16

Latitude/Northing	Longitude/Easting
$45^{\circ}39.4033$	$122^{\circ}45.4588$ W

Measured Water Depth: - 28.7'

(Leadline / Sounder / Other _____)

Vertical Datum: + 2.08' (MLLW / MLW / Other) + (RD @) 14:15Mudline Elevation: - 26.62'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 6"Percent Recovery 75 (%)Core/Drive Comments: 4' 6" Open / ? Maybe a void in the core - had lots of water pouring out of the nose before it could be capped. / Med fine to fine medium sand with 1-2 mm layer of silt on surface of core (brown with some white - medium sand med-fine to medium sand - some carbon material)

SEDIMENT CORE PROCESSING:

Date: 10/19/062 core sections
0-4' / 4'-9' 1/4"Processors: ASOMES, ISAU /Geologist: Mr Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.3	Sand (SP) 75-100% Fine grained Sand, 0-25% Fines, Wood fragment @ 1.6, trace medium grained sand, consist of lithic and mineral fragments (cinder+basalt/quartz, feldspar, mica) surrounded to subangular, medium gray, loose, stiff, micaceous, moderate to well sorted,	100% + LWD 4.1 + Sampling guidance Modified ASTM
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	2.3 < > 2.4	Sand (SW) 50-75% fine grained sand 25-50% fines, 25-50% wood fragments Silt nodule (a little ball of silt or clay?) moderate plasticity, medium gray, loose, stiff micaceous, poorly sorted	
	< >		
	2.4 < > 8.6	Sand (SP) 75-100% fine grained sand 0-25% medium grained sand, 0-25% fines medium grained sand and consist of lithic and mineral fragments of same material and shape as above (0-2.3), medium gray, loose, stiff, micaceous, lenses of medium grained sand @ 8-8.3 feet, well sorted	
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	Medium 5'-8' + 8.6' - 8.3' Finer grained		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06

Station Location: moving, downstream in 2nd Row from
Proposed pier head line) of DMMU in dredge
area

Samplers: JB/SC/BT/DD

Station ID: P0V-34

Coordinates:
15°40'

Latitude/Northing	Longitude/Easting
45°39.3964 N.	122°45.4710 W

Measured Water Depth: - 31.1' (Leadline Sounder / Other _____)

Vertical Datum: +3.53 (MLLW / MLW / Other) ± CRD @ 1545

Mudline Elevation: -27.57

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 9' 1"

Percent Recovery 72 (%)

Core/Drive Comments: 4' 11" Open) Med sand - as before / At cut between
core sections A & B several large pieces of gravel, sub-angular
and worn appearance.

SEDIMENT CORE PROCESSING:

Date: 10/18/06

2 consecutive
0-4', 4'-8' B"

Processors: ASomes I Sac I

Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 1.8	Sand (SP) 75-100% Fine grained sand 0-25% Fines, trace medium grained sand medium grained sand consists of lithic and Mineral Fragments (cinder/basalt/Quartz feldspar mica), medium gray, loose, stiff, micaceous moderate to well sorted	Conducted in accordance to LWG Guidance for Sediment Sampling, Modified ASTM
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	1.8 < > 4.3	Sand (SW) 25-50% Fine grained sand 25-50% medium grained sand, 0-25% coarse grained sand, 0-25% fines, trace fine grained, medium grained sand consists of lithic and mineral fragments as above, coarse grained sand consists of lithic subangular fragments gravel consists of lithic (grainite = phonericitic) and phonericitic (basalt?) sub rounded to subangular fragments, medium gray, dense, stiff, micaceous, poorly sorted	
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	4.3 < > 8.2	Sand (SP) 50-75% Fine grained sand 25-50% Fines, 0-25% medium grained Sand, upward fining gradational contact medium grained sand (near bottom) consist of same material and shape as above medium gray, loose, stiff, micaceous well to moderately sorting	
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PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06Samplers: JB/SC/BT/DDStation Location: Moving upstream in 3rd Row of DMHII from
outer edge of dredge areaStation ID: POV-35 POV-35

Coordinates:

14:15

Latitude/Northing	Longitude/Easting
<u>45° 31.3872 N</u>	<u>122° 45.4904 W</u>

Measured Water Depth: -34.4' (Leadline / Sounder / Other _____)Vertical Datum: + 2.86 (MLLW / MLW / Other + CRD @ 14:15)Mudline Elevation: -31.54'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 8' 4"Percent Recovery 66 (%)Core/Drive Comments: 5' 8" Open / Plakdrive to Medium sand and wood chips on
surface of core / medium sand with some fine to coarse sand and small gravel
at cut between core sections A & B / same materials in core rest

SEDIMENT CORE PROCESSING:

Date: 10/17/06 feet2 core sections
0-4' / 4'-7' 11"Processors: MS Marshall / ASornesGeologist: MS Marshall

Core Section(s)	Depth (<u>m</u>)	Core Profile/Comments	Sample ID(s)/Info.
0	< > 2	Sand (SP) 75-100% fine grained sand 0-25% medium grained sand 0-25% fines consists of lithic and mineral fragments (Cinder + basalt / quartz, feldspar, mica) Subrounded to Subangular, medium gray, loose, stiff, micaceous moderate to well sorted	* Logging conducted in accordance to LWG Sediment Sampling Guidance Modified ASTM
2	< > 5.4	Sand (SW) 50-75% fine grained sand, 0-25% medium to coarse grained sand 0-25% fine gravel 0-25% fines, medium grained sand consist of lithic and mineral fragments of same material and shape as above, coarse grained sand and gravel are lithic and subangular, medium gray, loose, stiff micaceous, poorly sorted	
5.4	< > 7.3	Sand (SP) 75-100% fine grained sand, 0-25% medium grained sand, 0-25% fines, medium grained sand, consists of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous, moderate to well sorted,	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06

Samplers: JB/SC/BJ/DD

Station Location: moving down stream along 2nd
flow of 10m from outside edge of project area Station ID: PON-36Coordinates:
13:20

Latitude/Northing	Longitude/Easting
45°39.3778 N	122°45.5107 W

Measured Water Depth: -37.7' (Leadline) Sounder / Other _____)

Vertical Datum: +2.82' (MLLW / MLW / Other CRD) @ 13:15

Mudline Elevation: -34.88'

Estimated Penetration: 12' 8" Refusal: None

Total Core Length: * 9' 8" Percent Recovery 76 (%)

Core/Drive Comments: 4' 4" Open/wood fragments on core surface)
Medium to coarse sand, small gravel in core nose.

SEDIMENT CORE PROCESSING:

Date: 10/17/06

3 core sections

0-4, 4-8, 8-9.5"

Processors: ASomes MMarshall

I.sav

Geologist: MMarshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 5.8	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand, wood debris first inch (wood chips, bark, broken branches) medium gray, loose, stiff, micaceous, well to moderate sorting	* logging conducted in accordance to LWG Sediment sampling guidance, mod: 5.0# ASTM
	< >		
	5.8 < > 6.4	Sand (SW) 50-75% fine grained sand, 0-25% medium grained sand, trace coarse grained sand	
	7.2	medium grained sand, trace 0-25% fine gravel, 0-25% fines, medium grained sand consists of lithic and mineral fragments	
	< >	lithic and mineral fragments, subangular to subrounded, coarse grained sand is composed of lithic subangular fragments (gritrite), bed of mostly	
	< >	subangular sand from 6.4-6.6, more sorted	
	6.4-6.6	subangular sand from 6.4-6.6, more sorted	
	7.2 < > 8.6	Sand (SP) 50-75% fine grained sand, 0-25% medium grained sand, 0-25% fines	
	< >	medium grained sand consists of same material	
	< >	and shape as above, alternating thin beds	
	< >	(10-20cm) of fine to medium grained sand, trace	
	< >	coarse grained sand in with medium grained sand	
	< >	thin beds, micaceous, medium gray, loose, stiff	
	< >	well sorted, sharp contacts between beds	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/BJ/DP.Station Location: ROV outside edge of project
moving upstreamStation ID: PDV-37

Coordinates:

09:26

Latitude/Northing	Longitude/Easting
<u>41° 39.36' N</u>	<u>122° 45.54' W</u>

Measured Water Depth: - 41' 11"

(Leadline / Sounder / Other _____)

Vertical Datum: + 1.75' (MLLW / MLW Other) (RD (+)) @ 0930Mudline Elevation: - 39.36'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 10' 5"Percent Recovery 82% (%)Core/Drive Comments: 3' 7" Open / 1' 5" cut A to B - medium sand-small gravel / Top of core - small wood chips. NOT as much water in core material

SEDIMENT CORE PROCESSING:

Date: 10/16/063 Core Sections
0-4, 4-8, 8-10Processors: ASomes MS MarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 < > 3.1		<u>Sand (SP)</u> > 75% fine grained sand, 50-25% fines, medium gray, loose, stiff, micaceous, well sorted	Logging by L.W. sediment sampling guidance modified ASRm
3.1 < > 9.2	< >	<u>Sand (SW)</u> 50-75% fine grained sand, 25% medium grained sand, 25% fines, trace fine gravel, medium grained sand consists of lithic and mineral fragments (cinder + basalt) / Quartz, feldspar, mica) surrounded fine gravel is lithic and surrounded to subangular face wood debris, medium gray, loose, stiff poorly sorted	
3.1 < > 9.2	< >		
9.2 < > 10	< >	<u>Sand (SW)</u> 50-75% fine grained sand, 25% medium grained sand, 25% fines medium grained sand consist of same material and shape as above, trace coarse grained sand, & subrounded to subangular micaceous, medium gray, loose, stiff	
9.2 < > 10	< >		
9.2 < > 10	< >		
9.2 < > 10	< >		
9.2 < > 10	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06Samplers: JB/SC/BJ/DDStation Location: Moving upstream in 1st row of DMNU in dredge area (from front proposed portwall). Station ID: POV - 38 (RBV-38)Coordinates: 45°44'

Latitude/Northing	Longitude/Easting
<u>45°39.3460 N</u>	<u>122°45.3921 W</u>

Measured Water Depth: -29.7' (Leadline / Sounder / Other _____)Vertical Datum: +2.52' (MLLW / MLW / Other) ± CRD C 14.45Mudline Elevation: -27.18'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 8"Percent Recovery 68 (%)Core/Drive Comments: 4' 4" Open / Medium sand at surface of core, also 1-2 mm brown silt on surface / med-fine to medium sand at cut between core sections A + B / Same material at cut between B + C core sections. Med-fine to medium sand in core nose

SEDIMENT CORE PROCESSING:

Date: 10/19/06Processors: ASomers/TSaul
3 core sections
0-4' / 4'-7' / 7'-11' 4-8' 8'-9' 3"Geologist: MS Marsden

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 5.4	<u>sand (SP)</u> 75-100% fine grained sand 0-25% fines, trace medium grained sand consists of lithic and mineral fragments (cinder, breccia, quartz, feldspar, mica) surrounded by subangular, medium gray, loose, stiff, micaceous, well to moderately sorted	Logging conducted in accordance to LWG sediment Sampling Guidance modified IHS TM
	< >		
	5.4 < > 7.9	<u>sand (SP)</u> 50-75% fine grained sand 25-50% fines, 0-25% medium grained sand, trace coarse/segregated sand, trace fine gravel, medium grained sand consists of lithic and mineral fragments of same material and shape as above, coarse grained sand and fine gravel consist of lithic surrounded by subangular fragments alternating beds of medium/coarse gravel (5-10cm), in between beds (10-40cm) of fine grained sand, beds are at an angle to the horizontal, medium gray, loose, stiff micaceous, moderate to well sorted	
	< >		
	< >		
	< >		
	7.9 < > 9.1	<u>sand (SP)</u> 75-100%, fine grained sand 0-25% fines, medium gray, loose, stiff micaceous, well sorted, consists of mineral and lithic fragments,	
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06

Samplers: JB/SC/BJ/DD

Station Location: Moving to 4th row of DMMS from outside
edge of shore edge of dredge area -
This 2nd row of DMMS from proposed pile headline.

Station ID: POV-39

Coordinates:
15:10

Latitude/Northing	Longitude/Easting
45° 39.3381 N	122° 45.4634 W

Measured Water Depth: - 31.8' (Leadline Sounder / Other _____)

Vertical Datum: + 3.45 (MLLW / MLW / Other) TCRD @ 15ft

Mudline Elevation: - 28.35

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 7' 8"

Percent Recovery 61 (%)

Core/Drive Comments: Different material or consistency about 9-11 ft. / 6' 4" down
Medium sand / some coarse sand + fine sand also. again lots of
changes in core material sand in core nose - med-fine to medium

SEDIMENT CORE PROCESSING:

Date: 10/18/06

2 core sections
0-4', 4'-7' 3"

Processors: Games, ISat

Geologist: MG Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0' < > 5'	See note above core drive above — 70 10/16/06. Sand (SP) 75-100% fine grained sand 0-25% fines, trace medium grained Sand, medium grained sand consists of lithic and Mineral Fragments (under the salt) Quartz, feldspar mica) Sub rounded, medium gray, loose, stiff micaceous, moderate to well sorted	✓ conducted in accordance to LWG Sediment Sampling guidance modified ASTM
	< >		
	< >		
	5' < > 6.5'	Sand (SP) 50-75% Fine grained sand 25-0% medium grained sand, 0-25% fines, medium grained sand consists of lithic and mineral fragments as above medium gray, loose, stiff, micaceous poorly sorted	
	< >		
	< >		
	< >		
	< >		
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/16/06Station Location: Moving upstream in 3rd row of DMMU from off-shore (outside) edge of dredge areaSamplers: JB/SC/BT/DOStation ID: POV-40

Coordinates:

Latitude/Northing	Longitude/Easting
<u>45° 39.3314 N</u>	<u>122° 45.4163 W</u>

Measured Water Depth: -34.3'

(Leadline / Sounder / Other _____)

Vertical Datum: + 3.21 (MLLW / MLW / Other + CRD @ 14:45)Mudline Elevation: -31.09Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 9' 1"Percent Recovery 72 (%)Core/Drive Comments: 4' 11" Open / large + core tube may have been leaning over over an angle / Med. Sand with some fine sand, some coarse sand and some small gravel at surface of core / Some material at cut between core sections A & B and in core base.

SEDIMENT CORE PROCESSING:

Date: 10/17/062 Core Sections
0-4' / 4'-8' 7"Processors: ASonos/MGMarshallGeologist: MSMarsilla

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.5	Sand (SP) 75-100% fine grained sand, 0-25% fines, medium gray, loose, stiff, micaceous, lamination@ 1 foot with wood debris well sorted	* Logging conducted in accordance with LWG sediment sampling guidance, modified ASTM
	< >		
	2.5 < > 3.7	Sand (SP) 50-75% medium grained sand, 25-50% fine grained sand, 0-25% fines, medium grained sand consist of lithic and mineral fragments (cinderbasalt/Quartz, feldspar, mica) subrounded to subangular, medium gray, micaceous, loose, stiff, poorly sorted	
	< >		
	3.7 < > 4.1	Sand (SP) same as 0-2.5	
	4.1 < > 4.7	Sand (SP) same as 2.5-3.7	
	4.7 < > 7.3	Sand (SP) 50-75% fine grained sand, 0-25% fines, 0-25% medium grained sand, 0-25% fines, trace fine gravel, trace coarse grained sand and medium grained sand consist of lithic and mineral fragments, of same material and shape as 2.5-3.7, fine gravel and coarse grained sand consist of lithic subangular fragments, medium gray, loose	
	< >		
	< >		
		STIFF, MICACEOUS, MODERATE SORTING	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/BT/DDStation Location: Moving down stream 2nd run
of DMME from outside edge of dredge areaStation ID: POV-41Coordinates: 11:57

Latitude/Northing	Longitude/Easting
<u>45°39.3200N</u>	<u>122°45.4357W</u>

Measured Water Depth: -37.3' (Leadline / Sounder / Other _____)Vertical Datum: +2.96' (MLLW / MLW / Other) CRD (C) 1200Mudline Elevation: -34.34'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 10' 1"Percent Recovery 80 (%)Core/Drive Comments: 3' 11" Open / Wood chips + gravel on surface of core /
Material appears coarser than POV-37, POV-42, POV-48

SEDIMENT CORE PROCESSING:

Date: 10/17/06

3 core sections

0-4, 4-8, 8-9' 8"

Processors: ASOMES, McMastall, IS (U)Geologist: MSM Marshall

Core Section(s)	Depth (ⁱⁿ)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 0.7	wood debris large pieces (1-2in) of bark and branches (broken), some fine grained sand mixed in but likely from lower sediment horizon	* logging conducted in accordance to LWG Sediment Sampling Guidance. modified ASTM
	0.2 < > 7.1	Sand (SP) 75-100% fine grained sand, 0-25% medium grained sand, 0-25% fines medium grained sand consists of lithic and mineral fragments (cinder, basalt, Quartz, feldspar, mica) subrounded, micaeous, medium gray, loose, stiff, well sorted	
	< >		
	7.1 < > 8.3	Sand (SW) 50-75% fine grained sand, 0-25% medium grained sand, 0-25% fine gravel, 0-25% fines, medium grained sand consists of same material and shape as 0.2-7.1 feet, gravel consists of lithic (granitic) free subangular fragments, medium gray, loose, stiff, poorly sorted	
	< >		
	8.3 < > 9.1	Sand (SW) 50-75% fine grained sand, 0-25% fines, 25-50% medium grained sand, medium grained sand consists of same size material and shape as above, medium gray, loose, stiff alternating thin beds of fine to coarse grained sand about 10-20 cm thick	
	< >		
	< >		
	< >		
	< >		

-37.3

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06

Samplers: JB/SC/BJ/DD

Station Location: outside edge of project site - moving upstream

Station ID: POV-42

Coordinates:

Latitude/Northing	Longitude/Easting
45°39.3025N	122°45.4714W

Measured Water Depth: - 41.8'

(Leadline / Sounder / Other)

Vertical Datum: +2.02 (MLLW / MLW / Other) CRD @ 10:00

Mudline Elevation: -39.78'

/ / MLW / Other

10

10:00

Fig. 1.12. $\sin \theta = \frac{1}{2}, \theta = 30^\circ$

Refusal: Name

Total Core Length: 10'

Percent Recovery 79 (%)

Core/Drive Comments: 4' open / medium fine sand / not as much water in core
Material: / fine grained sand in core nose

SEDIMENT CORE PROCESSING:

Date: 10/16/06

3 core sections

0-4,4-8,8-9.7

Processors: 450 meg MHz

Geologist: MS Marsha W.

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
		* Logging conducted in accordance to LwG guidance for sediment sampling modified USGS style	
	0- < > 4.4	Sand (sw) > 75% fine grained sand, 0-25% medium grained sand, 25% fines, < > Medium grained sand consists of lithic and mineral fragments, (carbonate/salt/quartz, feldspar/mica) surrounded, micaceous, medium gray loose, stiff, moderate sorting	
	4.4 - 6.2	Sand (sw) 50-75% medium grained sand, < > 50-75% coarse grained sand, trace fine gravel, trace fines, medium grained sand < > consists of same material and shapes as above Coarse grained sand is composed of lithic subangular fragments; medium gray, loose, stiff, micaceous	
	6.2 < > 8.9	Sand (sw) 75-100% fine grained sand, 0-25% fines, 0-25% medium grained sand, medium grained sand consists of same material and shape as above, medium gray loose, stiff, micaceous, trace wood debris < >	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06 upstream
 Last station in PSI row of DMNU (from)
 Station Location: proposed pier headline in dredge area

Samplers: JB/SC/BJ/DD
 Station ID: POV-43

Coordinates:
 15°20'

Latitude/Northing	Longitude/Easting
45°34.2919N	122°45.3378W

Measured Water Depth: ~31.6' (Leadline / Sounder / Other _____)

Vertical Datum: +2.83' (MLLW / MLW / Other ± CRD @ 15:15)

Mudline Elevation: -28.77'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 10' 1"

Percent Recovery 80 (%)

Core/Drive Comments: 3' 11" Open / Med.-fine to medium sand with 1-2mm layer of brown silt at surface of core / med.-fine to medium sand at cuts between core sections A + B and B + C / & med.-med. fine to medium sand in core base

SEDIMENT CORE PROCESSING:

Date: 10/19/06

3 core sections Processors: James, Jason
0-4'/4'-8'/8'-9'8" Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 5.3	Sand (SP) 75-100% fine grained sand 0-25% fines, medium gray, loose Stiff micaceous, well sorted	* logging conducted in accordance to LWL Sediment Sampling Guidance Modified ASTM
	5.3 < > 6.4	Sand (SP) 50-75% fine grained sand 0-25% fines, 0-25% medium to coarse grained sand, 0-25% fine gravel, medium grained sand consists of lithic and mineral fragments (cinder and basalt / Quartz feldspgr, mica) Subangular and subangular, coarse grained sand and gravel consist of lithic subangular fragments medium gray, loose Stiff, micaceous, poorly sorted	
	< >		
	< >		
	< >		
	6.4 < > 7.4	Sand (SP) 75-100% fine grained sand 0-25% fines, medium gray, loose, stiff micaceous, well sorted	
	7.4 < > 8.9	Sand (SP) 50-75% fine grained sand, 0-25% medium grained sand 0-25% fines medium grained sand consists of lithic and mineral fragments of same material and shape as 5.6-6.4 feet alternating thin beds (3-10cm) of medium grained sand between beds (2-25cm) of fine grained sand, contacts are sharp, beds are at an angle	
	< >		
	< >		

* the horizontal, medium gray, loose
Stiff, micaceous, well sorted

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/17/06

Samplers: JB/SC/BT/DD
Moving out (to offshore) in ninth (last) upstream row of OMNI's

Station Location: before 5 large single OMNI in dredge area Station ID: P0V-44

Coordinates:
15:54

Latitude/Northing	Longitude/Easting
45° 39.2858 N	122° 45.3495 W

Measured Water Depth: -33.2' (Leadline / Sounder / Other _____)

Vertical Datum: +3.21' (MLLW / MLW / Other ± CRD @ 16.00')

Mudline Elevation: -29.99

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 8' 11"

Percent Recovery 70 (%)

Core/Drive Comments: 5' 11" Open / fine-to medium sand with 1-2 mm layer of brown silt at top surface of core / med-fine to medium sand at core bottom / core sections A+B / med-fine to medium sand in core nose / noted some coarse material in all sections described.

SEDIMENT CORE PROCESSING:

Date: 10/19/06

2 core section
0-4' / 4'-7' 8"

Processors: AScomes ISau

Geologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 0.6	Sand (SP) 75-100% Fine grained sand, 0-25% fines, medium gray, loose, stiff, micaceous, moderate to well sorted	Logging conducted in accordance to LWG Sediment Sampling Guidance mod. from ASTM
	0.6 < > 1.1	Silt (ML) 75-100% Fines, moderate to low plasticity, medium gray, rapid dilatancy, low toughness,	
	1.1 4.6	Sand (SP) 75-100% fine grained sand, 0-25% fines, trace medium grained sand, medium grained sand consists of lithic and mineral fragments (Cinder basalt/Quartz feldspar, mica) surrounded to subangular, medium gray, loose, stiff, micaceous, moderate to well sorted	
	4.6 < > 5.1	Sand (SP) 50-75% Fine grained sand, 0-25% medium grained sand, 0-25% fines, medium grained sand consists of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous, poorly sorted	
	5.1 7.8	Sand (SP) 75-100% Fine grained sand, 0-25% fines, 0-25% medium grained sand, medium grained sand consist of same material and shape as above, medium gray, loose, stiff, micaceous	
	< >	moderate to well sorted,	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06Samplers: JB/SC/BJ/DDStation Location: Moving offshore from proposed pier headline
in the outer (last) column of DM MU towards the
outside edge of the dredge areaStation ID: POV - 45Coordinates:
09:15

Latitude/Northing	Longitude/Easting
<u>45° 39.2806 N</u>	<u>122° 45.3597 W</u>

Attempt #1 - 39.5'

Measured Water Depth: -31.5' (Leadline / Sounder / Other _____)Vertical Datum: +0.65' (MLLW / MLW / Other) (CRD @ 0915)Mudline Elevation: -30.85'

Attempt #1 / Attempt #2

Estimated Penetration: 12.18"Refusal: At -44' / NoneTotal Core Length: 4' 11" 9' 1"Percent Recovery 72 (%)Core/Drive Comments: 4' 11" Open / Med. sand = fine sand + silt (1-2 mm) with abundant
wood chips on surface of core / med sand at rest between race sections
44B / same sand in core nose with wood fragments

SEDIMENT CORE PROCESSING:

Date: 10/19/06

2 Core Sections

0-4' / 4'-8' 8"

Processors: A Somes / SaulGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.6	Sand (SP) > 75-100% fine grained sand, 0-25% fines, 0-25% medium grained sand, medium grained sand consists of lithic and mineral fragments (cinder + basalt, Quartz, feldspar, mica) surrounded to subangular medium gray, loose, stiff, micaceous, well sorted	Logging conducted in accordance to LWD sediment sampling guidance Modified ASTM
	2.6 < > 3.5	Sand (SW) 50-75% fine grained sand, 0-25% medium to coarse grained sand, trace fine gravel, 0-25% wood debris, medium grained sand consists of lithic and mineral fragments, same material and shape as above, medium gray, loose, stiff, micaceous, coarse grained sand and gravel consists of lithic subangular fragments, poorly sorted	
	3.5 < > 6.7	Sand (SP) 75-100% fine grained sand, 0-25% fines, 0-25% medium grained sand, medium grained sand consists of same material and shape as above, trace coarse grained sand consists of lithics surrounded to subangular fragments, medium gray, loose, stiff, micaceous, moderate to well sorted	
	6.7 < > 8.3	Sand (SP) 50-75% fine grained sand, 0-25% medium grained sand, 0-25% fines, trace fine gravel, medium grained sand consists of same material and shape as above	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06

Samplers: ~~ES~~ JB/SC/BJ/SDStation Location: Moving offshore from proposed pier headline
in 9th (most) column of DMW towards
the edge of the dredge area Station ID: POV - 46Coordinates:
09:43

Latitude/Northing	Longitude/Easting
45°39.2713N	122°45.3788W

Measured Water Depth: -35.2' (Leadline / Sounder / Other _____)

Vertical Datum: +0.48' (MLLW / MLW / Other) + (RD @ 09:45)

Mudline Elevation: -34.72'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 9' 8"

Percent Recovery 76 (%)

Core/Drive Comments: 4' 4" Open / Med. sand with 1-2 mm layer brown silt on surface
of core / med. sand at cut between core sections A + B /
not as much water in this core as before

SEDIMENT CORE PROCESSING:

Date: 10/19/06 10/19/06

Processors: AScore, ISail

2 core sections
0-4' / 4' - 9' 3" > 5"

Geologist: M Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0	< > 5.1	Sand (SP) 75-100% fine grained sand 0-25% fines, medium gray, loose, stiff micaceous, well sorted	* logging conducted in accordance to LWG Sediment Sampling Guidance Mod. Fied A Star
	< >		
5.1	< > 9.0	Sand (Sw) 75-100% fine grained sand, 0-25% fines, 0-25% medium grained sand, trace fine gravel, medium grained sand consists of lithic and mineral fragments (Cinder basalt / Quartz feldspar, mica) sub rounded to subangular, gravel consist of lithic subangular to subrounded fragments medium gray, loose, stiff, micaceous, poorly sorted	
	< >		
	< >		
	< >		
	< >		
	< >		
	< >		
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/B.J./DD.Station Location: Outside Edge of proposed site - morning-upstreamStation ID: POV-SJS47

Coordinates:

10:45

Latitude/Northing	Longitude/Easting
<u>45°39.72541 N</u>	<u>122°45.46946 W</u>

Measured Water Depth: -43.5' (Leadline) Sounder / Other 43.5', w/70 10/13/06Vertical Datum: +2.49' (MLLW / MLW / Other CRD)Mudline Elevation: -41.01'Estimated Penetration: 12.8"Refusal: NoneTotal Core Length: 9'10"Percent Recovery 78 (%)Core/Drive Comments: 4'2" Open / Fine - Medium grained sand / slightly more water in core material than the previous two samples

SEDIMENT CORE PROCESSING:

Date: 10/16/063 Sections
0-4, 4-8, 8-9.5"Processors: MS/Marshall/ASongasGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 4.2	<u>Sand (SP)</u> 75-100% fine grained sand, 50-25% fines, medium gray, loose, soft to stiff, micaceous, well sorted	# Logging conducted in accordance to LWG Guidance for sediment sampling, Modified ASTM
	4.2 < > 6.11	<u>Sand (sw)</u> 75-100% fine grained sand, 25% fine gravel, lithic, subangular, 25% fines, micaceous, medium gray, loose, stiff, trace medium grained sand poorly sorted	
	< >		
	6.4 < > 8.9	<u>Sand (SP)</u> 75-100% fine grained sand, 25% fines, micaceous, medium gray, loose, stiff, thin bed of medium grained sand 7.6 to 7.8 feet, consists of lithic and mineral fragments (cinder+basalt/quartz? feldspar+mica) well sorted	
	< >		
	< >		
	< >		
	< >		
	< >		
	< >		
	< >		
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/13/06Samplers: JB/SC/BJ/DDStation Location: Upstream end of project - from outside edge of dredge area to inside edge of dredge areaStation ID: DOV-48Coordinates:
11:26

Latitude/Northing	Longitude/Easting
<u>45° 39.2213N</u>	<u>122° 45.3140W</u>

Measured Water Depth: - 39.7' (Leadline / Sounder / Other _____)Vertical Datum: + 2.85' (MLLW / MLW / Other CRD C) 1130Mudline Elevation: - 36.85'Estimated Penetration: 12' 8"Refusal: NoneTotal Core Length: 10' 1"Percent Recovery 80 (%)Core/Drive Comments: 3' 0" Open / Sand in core nose with fine → med → coarse grained / sand in cuts between sections A + B and section B + C were fine → med-fine sand.

SEDIMENT CORE PROCESSING:

Date: 10/16/063 sections
0-4, 4-8, 8-9' 8"Processors: AScomes MS MarshallGeologist: MS Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 < > 4.1		<u>Sand (SP) 75-100% Fine grained Sand</u> 25% fines, trace med micaceous, medium gray loose, st. ff, well sorted	☒ Logging conducted According to LWG Guidance for Sediment Sampling (modified) ASTM
4.1 < > 5.1	< >	<u>Sand (sw) 50-75% Fine grained sand</u> , 25-50% medium grained sand, 0-25% fines Trace, fine gravel, medium grained sand consists of lithic and mineral fragments, surrounded gravel consists of lithic, subangular fragments, micaceous, medium gray loose, st. ff, poorly sorted	
5.1 < > 7.9	< >	<u>Sand (SP) 75-100% Fine grained sand</u> 25% fines, trace medium grained sand consists of lithic and mineral fragments Same material and shape as above, micaceous medium gray, loose, stiff, well to moderate sorting	
7.9 < > 8.8	< >	<u>Sand (sw) 50-75% Fine grained sand</u> , 0-25% medium grained sand, 0-25% fines trace coarse grained sand, medium grained sand consists of lithic and mineral fragments surrounded to subangular, micaceous, medium gray, loose, stiff, coarse coarse grained sand consists of subangular lithic fragments	

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06

Station Location: Moving into site. ^{DMMU} sections at upstream end of dredge area

Samplers: JB/SC/BJ/DD

Station ID: POV - 49

Coordinates:
1009

Latitude/Northing	Longitude/Easting
45° 39.1709 N	122° 45.2402 W

Measured Water Depth: -40' (Leadline / Sounder / Other _____)

Vertical Datum: +0.30' (MLLW / MLW / Other TCD @ 10/15)

Mudline Elevation: -40.4"

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 9' 7"

Percent Recovery 76 (%)

Core/Drive Comments: 4'5" Open / Med. sand and thin layer of brown silt on surface of core / med sand with a few pieces coarse material at cut between core sections A+B / same materials in core nose.

SEDIMENT CORE PROCESSING:

Date: 10/19/06

2. Core Sections
0-4' / 4'-9' 2"

Processors: ASensey, TScot

Geologist: M Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 <> 5.6		Sand (SP) 75-100% fine grained sand, 0-25% fines, medium gray loose, stiff, micaceous	✓ modified ASTM
5.6 <> 6.4		Sand (SP) 50-75% fine grained sand, 0-25% medium grained sand 0-25% fines, medium grained sand consists of lithic and mineral fragments (cinder basalt/quartz, feldspar, mica) surrounded by medium gray loose, stiff micaceous, well to moderately sorted	
<>			
<>			
6.4 <> 6.5		Silt (ml) 75-100% fines, low plasticity rapid dilatancy, medium gray	
6.5 <> 8		Sand (SP) 50-75% fine grained sand 0-25% medium grained sand, 0-25% fines trace coarse grained sand, medium grained sand consists of lithic and mineral fragments of same material and shape as above, coarse sand is lithic and subangular alternating thin beds of medium and coarse grained sand (5-10cm) in between beds (20-30cm)	
<>			
<>			
<>			
<>			

of 8 me grained sand, medium gray, 100% stiff, micaceous, moderately sorted. Page 1 of 1
 Coarse contacts are sharp others are gradational.

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06

Samplers: JB/SC/BJ/DD

Station Location: Moving into another single domain at upstream
ends of dredge area

Station ID: POV-50

Coordinates:
10:39

Latitude/Northing	Longitude/Easting
45° 39.1567 N	122° 45.1395 W

Measured Water Depth: -29.2'

(Leadline / Sounder / Other _____)

Vertical Datum: 0.13' (MLLW / MLW / Other) + CRDC 10:45

Mudline Elevation: -29.07'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 98' 0"

Percent Recovery 63 71 (%)

Core/Drive Comments: 5' Green / Med. sand with 1-2 mm layer of brown silt + fine sand at surface of core / also wood fragments on surface of core / med sand with some gravel (brown/reddish) at cut between core sections At 3' same materials in core nose.

SEDIMENT CORE PROCESSING:

2 core sections
0-4' / 4'-8' 8"

Processors: A Somes & Sall

Date: 10/19/06

Geologist: M Marshall

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
0 <> 4.3	<>	Sand (SP) 75-100% f, fine grained sand 0-25% Fines, trace medium grained sand consists of lithic and mineral fragments (cinder, basalt/Quartz, Feldspar, mica) subangular to subangular, medium gray, loose, stiff micaceous, moderate to well sorted	Logging conducted in accordance to LWG Sediment Sampling Guidance modified ASTM
4.3 4.7	<>	Sand (SW) 50-75% f, fine grained sand, 0-25% medium to coarse grained sand 0-25% Fines, 0-25% wood debris. trace fine gravel, medium grained sand consists of lithic and mineral fragments of same material and shape as above coarse grained sand and gravel consists of lithic subangular fragments, medium gray, loose, stiff, micaceous, poorly sorted	
4.7 6.6	<>	Sand (SP) same as 0-4.3 feet	
6.6 8	<>	Sand (SW) 50-75% medium grained sand, 25-50% fine grained sand, 0-25% Fines trace coarse grained sand, medium grained sand consist of same material and shape as above	Trace fine gravel

Coarse grained sand same as above
is lithic subangular fragments, medium gray
loose, stiff, micaceous, moderately sorted

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06

Samplers: JB/SC/BJ/DD

Station Location: Moving upstream in the single Dimmu group
To the most upstream extent of the dredge area. Station ID: P0V-51Coordinates:
11:14

Latitude/Northing	Longitude/Easting
45° 39.123 N	122° 45.0919 W

Measured Water Depth: ~ 26.8' (Leadline / Sounder / Other) Hose Mark

Vertical Datum: (-) 0.02' (MLLW / MLW / Other) TCRD @ 11:15

Mudline Elevation: -26.82'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 8' 6"

Percent Recovery 67 (%)

Lots of water in core

Core/Drive Comments: Moved barge over exact location of station 51/Verified onto sample of station by approx. 20 ft. with Andrew Sommer / actual sample collected about 6 ft from exact GPS location 15' 6" Deep / Med. sand w/ $\frac{1}{2}$ 1-2 mm layer of brown silt/fine sand w/ some gravel on surface of core / material the same at mid between core sections A+B (and in core next).

SEDIMENT CORE PROCESSING:

2 core sections Processors: ASOMES I SAIL
0'-4'/4'-8' 1"

Date: 10/19/06

Geologist: M Marshe (1)

Core Section(s)	Depth (<in>)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.3	Sand (SP) 75-100% fine grained sand 0-25% fines, medium gray, loose, stiff, micaceous, well sorted	
	2.3 < > 4.1	Sand (SW) 50-75% fine grained sand 0-25% medium grained, 0-25% fines, trace 0-25% coarse grained sand, trace fine gravel medium grained sand consists of lithic and mineral fragment (limestone/basalt/Quartz, feldspar, mica) subrounded to subangular, coarse grained sand and gravel consists of lithic subangular fragments, moderate to poorly sorted medium gray, loose to loose, stiff, micaceous	
	< >		
	< >		
	< >		
	4.1 < > 5.6	Sand (SP) Same as 0-2.3 feet	
	< >		
	5.4 < > 8	Sand (SW) 25-50% medium grained sand 0-25% fine grained sand, 0-25% coarse grained sand, 0-25% fine gravel, trace 0-25% fines, medium grained consists of lithic and mineral fragments of sand material and shape as above, coarse grained sand and gravel consists of lithic subangular fragments, medium gray, loose, stiff, micaceous, moderately sorted	
	< >		
	< >		
	< >		

PARAMETRIX SEDIMENT CORE LOG SHEET

Project Number: _____

SEDIMENT CORE SAMPLING:

Date: 10/18/06

Samplers: JB/SC/BJ/DD

Station Location: moving upstream in the single drum group
to the most upstream extent of the dredge area

Station ID: PG V-52

Coordinates:
11:46

Latitude/Northing	Longitude/Easting
45° 39.104 N	122° 45.098 W

Measured Water Depth: 38.4' (Leadline / Sounder / Other) C.H. Rose At Park

Vertical Datum: -0.14' (MLLW / MLW / Other) ± CRD @ 11:45

Mudline Elevation: -38.54'

Estimated Penetration: 12' 8"

Refusal: None

Total Core Length: 8' 3"

Percent Recovery 65 (%)

Core/Drive Comments: 5' 9" Open / Med. sand with 1-2 mm layer brown silt/pis sand
with a few small wood fragments at surface of core / med. sand with some
gravel and cut between core sections A + B / same materials in core
zone.

SEDIMENT CORE PROCESSING:

2 core sections Processors: AS samples Tsau

Date: 10/19/06

0-4' 4"-7' 10"

Geologist: M Marshall

Core Section(s)	Depth (ft/in)	Core Profile/Comments	Sample ID(s)/Info.
	0 < > 2.7	Sand (SP) 75-100% Fine grained sand 0-25% medium grained sand, 0-25% fines, trace coarse grained sand medium grained sand consist of 1/8inch mineral fragments (cinder, basalt, quartz feldspar, mica) surrounded to subangular Medium gray, loose, stiff, micaceous coarse grained sand consist of lithic subrounded fragments moderately sorted Sand (3w) 50-75% fine grained sand, 0-25% medium grained and coarse grained sand, 0-25% fines, trace fine gravel, medium grained sand consists of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous, gravel consists of lithic subrounded to subangular fragments, moderate to poorly sorted	mod. fied ASTM
	2.7 > 3.6	Sand (SP) 50-75% fine grained sand, 0-25% medium grained and coarse grained sand, 0-25% fines, trace fine gravel, medium grained sand consists of lithic and mineral fragments of same material and shape as above, medium gray, loose, stiff, micaceous, gravel consists of lithic subrounded to subangular fragments, moderate to poorly sorted	
	3.6 < > 7.10	Sand (SP) same as 0-2.7 feet	
	< >		