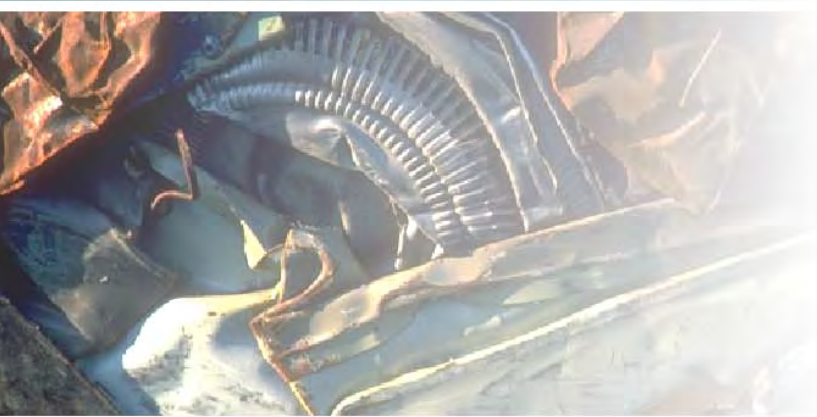




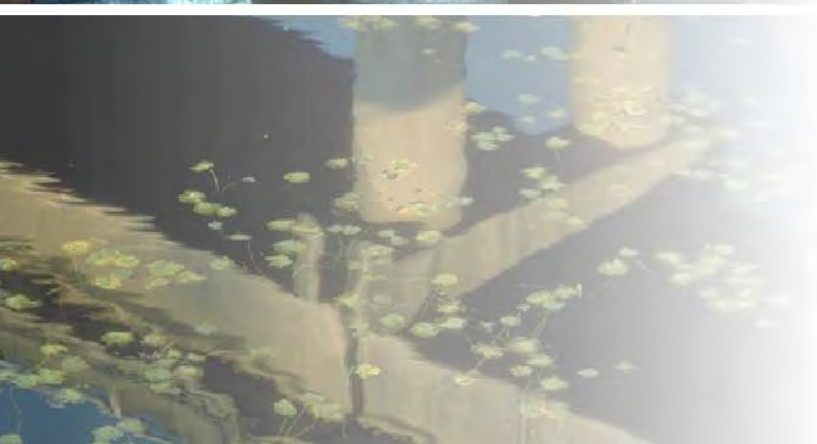
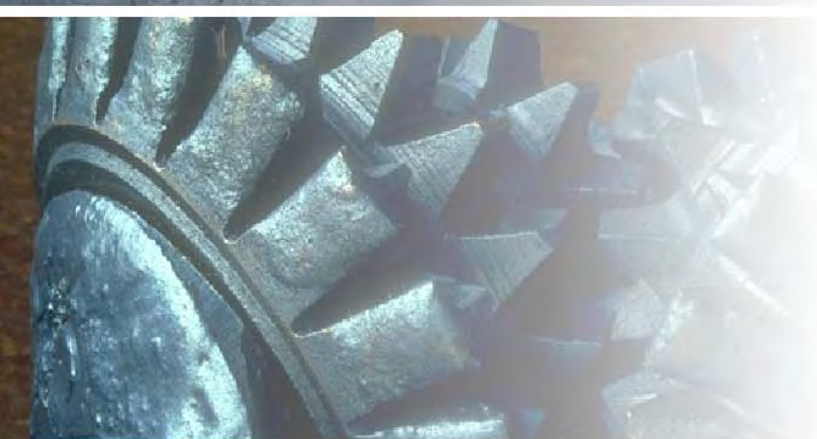
***Sediment Characterization Report
Terminal 6, Berths 601 and 607
Portland, Oregon***



***Prepared for
Port of Portland***



***June 12, 2008
15667-00***

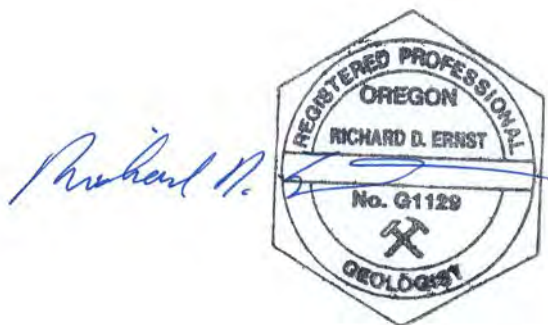


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Terminal 6, Berths 601 and 607
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Prepared by
Hart Crowser, Inc.



Richard D. Ernst, RG
Principal

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ACRONYMS

ARI	Analytical Resources, Inc.
COC	chemical of concern
Corps	U.S. Army Corps of Engineers
CRD	Columbia River Datum
cy	cubic yard
DMMU	Dredge material management unit
EPA	Environmental Protection Agency
JPA	joint permit application
LCS	laboratory control sample
MDL	method detection limit
MRL	method reporting limit
MS	matrix spike
NOAA	National Oceanic and Atmospheric Administration
NSM	new surface material
NUC	Northwest Underwater Construction
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
Port	Port of Portland
QA/QC	quality assurance/quality control
RSET	Regional Sediment Evaluation Team
SAP	Sampling and Analysis Plan
SEF	Northwest Regional Sediment Evaluation Framework
SL	screening level
SVOC	semivolatile organic compound
TBT	tributyltin
TOC	total organic carbon

SEDIMENT CHARACTERIZATION REPORT

TERMINAL 6, BERTHS 601 AND 607

PORTLAND, OREGON

1.0 INTRODUCTION

The Port of Portland (Port) is proposing to conduct maintenance dredging at Berths 601 and 607 at Terminal 6 along the south bank of the Columbia River on the Oregon Slough in Portland, Oregon (Figure 1). To provide chemical quality data on sediment to be dredged and the future “leave surface” or new surface material (NSM), sediment characterization activities were completed in accordance with the Northwest Regional Sediment Evaluation Framework (SEF) Interim Final (U.S. Army Corps of Engineers [Corps] et al., 2006) and our Sampling and Analysis Plan (SAP) (Hart Crowser, 2008) as modified by comments from the Regional Sediment Evaluation Team (RSET). This report presents the results and findings of these activities.

1.1 Terminal 6 and Berth Description

Terminal 6 is located at 7201 N. Marine Drive in Portland, Oregon, along the south bank of the Columbia River on the Oregon Slough. The terminal spans approximately 1.5 miles beginning at river mile (RM) 102 on the Columbia River and ending upstream at RM1 on the Oregon Slough (Figure 1). Terminal 6 has five berths (Berths 601, 603, 604, 605, and 607). The project site is Berths 601 and 607, which are used for the unloading of Hyundai and Honda automobiles, respectively.

Figures 2 and 3 show Berths 601 and 607, along with June 2007 bathymetric surveys conducted by the Port. Sediment contours are relative to the Columbia River Datum (CRD). The berthing area for Berth 601 is approximately 1,350 feet long and 120 feet wide (Figure 2). Berth 607 is approximately 1,400 feet long and 145 feet wide. Based on a 2007 bathymetric survey, the river bottom ranges from -27 to -51 feet CRD at Berth 601 and from -30 to -46 feet CRD at Berth 607. The design depth for both berths is -35 feet CRD.

1.2 Previous Sediment Characterization Activities

Maintenance dredging was last performed in 1989 at Berth 601 and in 1982 at Berth 607. Sediment characterization data are not available for these berths.

1.3 Project Description

Maintenance dredging is needed due to the gradual and persistent deposition of river sediment in the berthing areas that compromises the authorized navigational depth clearances required for ships. The Port submitted a Joint Permit Application (JPA) in February 2008 to the Corps and the Oregon Department of State Lands to perform maintenance dredging at Berths 601 and 607 (Port/ENVIRON, 2008).

In-water dredging activities will be performed during the Columbia River in-water work window from November 1 through February 28. Project specifics for each berth are presented below, including the target dredging depth, the approximate leave surface elevation for NSM considering overdredge for inherent dredging accuracy, and the estimated volume of sediment to be dredged. Figures 2 and 3 show the sediment areas requiring dredging at Berths 601 and 607, respectively.

- Berth 601. The desired operating draft is -35 feet. Dredging will occur to a depth of -36 feet CRD plus up to 2 feet of overdredge allowance. The leave surface would likely average -37 feet CRD. The estimated volume of sediment is approximately 7,300 cy (between -27 and -37 feet CRD).
- Berth 607. The desired operating draft is -35 feet. Dredging will occur to a depth of -36 feet CRD plus up to 2 feet of overdredge allowance. The leave surface would likely average -37 feet CRD. The estimated volume of sediment is approximately 1,300 cy (between -30 and -37 feet CRD).

The Port will use its standard berth dredging methods, which are designed and have been previously demonstrated to minimize water quality impacts. A clamshell dredge will remove sediments using a close-lipped bucket operated either from the dock or from a floating crane. The depth and position of the bucket and dredge will be monitored by visual and positioning computer systems. The dredge material will be placed in a barge for transport and placement at a Corps-approved upland placement facility, either the Suttle Road Placement Facility or the West Hayden Island Placement Facility, or another approved beneficial use site. Placement of this dredged material is not anticipated to generate return water to the Columbia River at these facilities. The JPA discusses the proposed maintenance dredging project in further detail (Port/ENVIRON, 2008).

2.0 SEDIMENT CHARACTERIZATION OBJECTIVES

The overall objectives of this sediment characterization study were to characterize the quality of the proposed dredge material and NSM for permitting. As such, the specific objectives of the study were to:

- Characterize sediment affected by proposed dredging activities along the berths (i.e., the dredge prisms) to document the chemical quality of the sediments;
- Additionally, characterize the underlying NSM (a.k.a. leave surface) along the berths to document the chemical quality of these remaining sediments;
- Collect, handle, and analyze samples representative of the dredge prisms and NSM sediments in accordance with the SEF;
- Compare the sediment analytical results to SEF screening levels (SLs) to evaluate the nature of the dredge prisms and NSM sediments; and
- Evaluate and report the results of the analytical sediment testing in a complete and timely manner to support the permitting process.

Sediment characterization activities were conducted in accordance with our SAP (Hart Crowser, 2008), the SEF, and an EPA technical manual for sediment sampling (EPA, 2001). Quality assurance/quality control (QA/QC) procedures described in our Quality Assurance Project Plan in the SAP were followed. RSET approved the SAP in February 2008 (RSET, 2008), but requested that all six NSM samples be analyzed instead of the two samples proposed in the SAP (one at each berth).

3.0 SAMPLING AND ANALYSIS ACTIVITIES

This section summarizes these sampling activities and presents the analytical program for the dredge prism and NSM samples. This scope of work was conducted in accordance with the SAP (Hart Crowser, 2008).

3.1 Sediment Sampling

On March 12, 2008, Northwest Underwater Construction (NUC) of Vancouver, Washington (under subcontract to Hart Crowser) obtained sediment cores C-1 through C-6 from along Berths 601 and 607 (Figure 2). A representative of Hart Crowser was present to observe and document the coring activities and to collect dredge prism and NSM samples for analysis. Logs of the cores are included in Appendix A.

Field Coring Procedures. Positioning over each core location was performed using a global positioning system (GPS). Cores were obtained using a vibracorer with a 4-inch-diameter core barrel deployed from a sampling vessel operated by NUC. Cores were advanced from 2 to 8.5 feet, penetrating through the proposed dredge prism and the uppermost 1-foot of NSM that will remain after dredging. Sediment was contained in a polycarbonate liner inside of the core barrel.

Upon retrieval of the vibracorer, the liner with core was removed from the core barrel, and the ends sealed with caps. The sediment core was examined for acceptance. Core recoveries ranged from 70 to 95 percent. Core C-3 had slightly less than the preferred minimum recovery of 75 percent; but was deemed acceptable as this core was the best of three attempts retrieved from this location, the lower recovery appeared to be due to core compaction and the settling of the upper portion of the core, and the dredge prism and NSM were well represented.

Table 1 presents the sediment sample identification, core coordinates, mudline elevations, and target sample intervals. The sediment cores were then transported to our office for processing.

Core Processing for Samples. In the processing area, the core liners were split lengthwise and sediment photographed and described (including, as appropriate, physical description, odor, visual stratification, debris, and biological activity). As described further below, two samples were collected from the dredge prism and NSM from each core. The samples were labeled with the berth designation (T601 or T607), core location (C1 to C6), and the depth of the sample horizon (e.g. suffix MD for maintenance dredge prism, and suffix Z for the NSM sample [a.k.a. a Z-sample]). A separate dredge material management unit (DMMU) was designed at each berth for dredge prism material. A composite sample of the dredge prism was collected from cores within each DMMU, and labeled simply as T601-MD and T607-MD.

Dredge Prism Samples. After logging, sediment representing the entire depth of the dredge prism from each core was placed into a stainless steel bowl and homogenized with a stainless steel spoon until both color and texture were uniform. A discrete sample (e.g., T601-C1-MD) was obtained for archival purposes (these samples were frozen at the laboratory). The homogenized contents from the core were then combined (composited) with other sample cores from the same DMMU. The compositing of sediment for each DMMU yields a sample representative of the sediment of the dredge prism, which is being removed and placed at an upland placement site. For the DMMU at Berth 601, sediment from cores C1, C2, and C3 were composited (e.g., T601-MD). For the DMMU at Berth 607, sediment from cores C4, C5, and C6 were composited. These two composite samples were submitted for analysis. Table 2 summarizes sampling scheme used for the dredge prism.

NSM Samples. A discrete sample of the NSM from the anticipated leave surface from each core was collected (i.e., -37 to -38 feet CRD at Berth 601 and 607). All these NSM samples were submitted for analysis (Table 2).

3.2 Analytical Program

All samples were submitted under chain of custody to Analytical Resources, Inc. (ARI), of Tukwila, Washington (under subcontract to Hart Crowser). Dredge prism and NSM samples selected in Section 3.1 above were analyzed for the physical and chemical analyses listed below.

- Grain size by ASTM D 422M;
- Total solids by EPA Method 160.3;
- Total organic carbon (TOC) by Plumb (1981);
- Ammonia by EPA Method 350.1M;
- Sulfide by EPA Method 376.2;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Method 200.8/6010B/7471A;
- Tributyltin (TBT) by Krone, et al. (written 1988; published 1989);
- Polynuclear aromatic hydrocarbon (PAHs) by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A; and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082.

3.3 Modifications to the SAP

Sample protocols were conducted in accordance with the SAP (Hart Crowser, 2008). No modifications to the SAP were prompted by field conditions. The analytical program followed the SAP, except for the following.

- As requested by RSET (2008), all six NSM samples were analyzed instead of the two samples proposed in the SAP (one at each berth).
- Antimony and arsenic were analyzed by EPA Method 200.8 to obtain lower method reporting limits (MRLs) for comparison to screening levels.

4.0 SEDIMENT QUALITY

ARI completed analyses on two dredge prism composite samples and six NSM samples from Berths 601 and 607. Tables 3 and 4 list the physical and chemical results, respectively. Chemical results were compared to SEF SLs to assess the

chemical quality of the dredge prism and NSM sediments. This section presents the results and provides an evaluation of them.

4.1 Data Quality Review

A QA review of the data is provided in Appendix B. Both MRLs and method detection limits (MDLs) were reported for all chemical analyses except conventional analyses (although the ARI reports MDLs for metals, they do not estimate concentrations between the MDL and MRLs). The laboratory analyzed QC samples, including surrogates, method blanks, laboratory control samples (LCS), matrix spikes (MS), and laboratory, LCS, and MS duplicates. Upon review, the overall data quality objectives for collection and chemical testing of sediment samples were met, and the data for this project are acceptable for use as qualified. Laboratory reports for chemical analysis, including QC samples, are included in Appendix C.

4.2 Grain Size Characteristics

The grain size results are presented in Table 3, and grain size distribution curves are provided in Appendix C. The grain size distributions of the dredge prism composite samples (T601-MD and T607-MD) were similar, consisting of 54.5 to 59.5 percent fines and classified as a slightly clayey, very sandy silt. The NSM samples ranged from a sandy silt to a slightly silty sand. At each berth, NSM sediments became increasingly sandy upstream. The downstream samples at each berth had 69.2 to 72.6 percent fines (sandy silt), whereas upstream samples had 12.6 to 18.6 percent fines (a slightly silty sand).

4.3 Comparison to SEF Screening Levels

Table 4 presents the chemical results on the sediment samples. Per our SAP, these results were compared to the SEF SLs. These SLs were established in the SEF for protection of the aquatic environment and to provide a uniform framework for evaluating sediment quality of dredged material for unconfined aquatic disposal. Where established, SEF SLs in Table 4 are freshwater Screening Level 1 values from Table 7-1 of the SEF (revised October 20, 2006). If freshwater SLs were not available, marine SLs were used for comparison. Other SLs are also available, such as threshold effects levels, probable effects levels, and bioaccumulation screening level values. These SLs are listed with the data in Appendix D for reference.

4.3.1 Berth 601

Analytical results for the dredge prism sample and three NSM samples were compared to SEF SLs in Table 4. As indicated below, all detected chemical concentrations were below SLs.

Dredge Prism Sample. Analytical results for composite sample T601-MD indicate that detected concentrations of metals, TBT, SVOCs, and pesticides were below SEF SLs. PCBs were not detected.

NSM Samples. Analysis of the discrete NSM samples from cores C1, C2, and C3 indicate that detected concentrations of metals, TBT, SVOCs, and pesticides were below SEF SLs. PCBs were not detected.

4.3.2 Berth 607

Results for the dredge prism sample and three NSM samples were compared to SEF SLs in Table 4. Detected chemical concentrations were generally below SLs, except as noted below. SL exceedances are discussed further in Section 4.4.

Dredge Prism Sample. Analytical results for composite sample T607-MD indicate that detected concentrations of metals, SVOCs, and pesticides were below SEF SLs. PCBs were not detected. TBT was detected at 160 µg/kg, exceeding its freshwater SL of 75 µg/kg.

NSM Samples. Analysis of the discrete NSM samples from cores C4, C5, and C6 indicate that detected concentrations of most metals, SVOCs, and pesticides, were below SEF SLs. PCBs were not detected. Two exceedances were observed: 135 mg/kg zinc in sample T607-C4-Z (SL of 130 mg/kg); and 350 µg/kg in sample T607-C5-Z (SL of 75 µg/kg).

4.4 Data Evaluation

Sediment data for Berth 601 did not exceed SEF SLs for dredge prism and NSM sediments. For Berth 607, two chemicals of concern (COCs) were detected above their SLs: zinc and TBT. Further evaluation of these two COCs is as follows.

Zinc. Zinc was detected just barely above its SL 1 (130 mg/kg) in just one of the three NSM samples at a concentration of 135 mg/kg. This SL 1 represents a value at which no adverse effects are anticipated. Overall, this slight exceedance does not suggest that the NSM at Berth 607, when exposed, would pose an environmental risk due to it basically being right at the SL, that the other two NSM

samples and the NSM average are all well below the SL, and the extremely small area affected by the proposed dredging project (approximately 15,000 square feet; Figure 3). Additionally, the detected concentration of zinc is well below its SEF SL 2 of 400 mg/kg, which represents a division between where minor versus significant adverse effects may occur.

TBT. TBT is present in antifouling paints on ships to prevent biological growth on the ships' hulls. At berths, the presence of TBT in sediment may result from the flaking off of antifouling paint from ships, presumably when they rub against the dock. Therefore, the occurrence and magnitude of TBT in sediment depends on the proximity of the sample to the dock (including downstream) and the number of paint flakes present in the sample. Additionally, TBT slowly leaches from the painted hulls and paint flakes, and will adsorb onto suspended particles that can settle as sediment. Because TBT analysis uses only a small amount of sediment (10 grams), the resultant concentration can be variable depending on the number of paint flakes in this aliquot. To minimize this variability and provide an overall sediment concentration, sediment from the cores was homogenized prior to obtaining the sediment sample for analysis.

TBT was detected above its SL 1 (75 µg/kg) in the dredge prism sample (160 µg/kg) and the NSM sample in front of the Berth 607 dock (350 µg/kg). No SL 2 value has been developed. Based on the NSM data and the above discussion regarding TBT from flaking paint, the area of exceedance is likely localized in front of the berthing dock. Considering that the dredge prism sample represents a composite of three cores, removal of the dredge prism (160 µg/kg TBT) is actually predicted to result in improvement in sediment quality along the berth, as the average concentration of the resultant NSM based on the three Berth 607 NSM samples would be 120 µg/kg.

5.0 SUMMARY

The Port is proposing to conduct maintenance dredging at Berths 601 and 607 to maintain the navigational depth clearances for vessels docking at these berths. Approximately 7,300 and 1,300 cy of sediment, respectively, will be dredged from these berths. In March 2008, three sediment cores each were collected from these berths. Composite dredge prism and discrete NSM samples were submitted for analyses per the approved SAP.

Analytical results on samples from Berth 601 showed that both dredge prism and NSM sediments are below SEF SLs. Sediment data for Berth 607 indicated two COCs exceeding SEF SLs: zinc in one NSM sample, and TBT in the dredge prism and one NSM sample. The zinc exceedance is minimal (135 mg/kg versus an SL of 130 mg/kg) and is unlikely to pose an environmental concern as discussed in

Section 4.4. TBT concentrations are several times the SEF SL of 75 µg/kg; however, the small area affected by the proposed dredging project and the overall on average similar TBT concentrations in the dredge prism and resultant NSM do not suggest a detrimental effect to the aquatic environment would occur from the proposed dredging project.

6.0 REFERENCES

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Table 1 - Sampling Locations and Elevations
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Core Sample Location	Northing	Easting	Core Penetration in Feet	Percent Sediment Recovery	Approximate Mudline Elevation*	Average Dredge Depth	Dredge Prism Interval	NSM Interval
Berth 601								
C1	730460.8	7624601.1	2.0	90	-36	-37	-36 to -37	-37 to -38
C2	729951.8	7625048.8	6.5	90	-31.5	-37	-31.5 to -37	-37 to -38
C3	729712.8	7625262.5	8.5	70	-29.5	-37	-29.5 to -37	-37 to -38
Berth 607								
C4	725430.6	7629130.5	6.0	95	-32	-37	-32 to -37	-37 to -38
C5	725170.8	7629365.0	2.5	95	-35.5	-37	-35.5 to -37	-37 to -38
C6	724973.7	7629530.1	4.5	80	-33.5	-37	-33.5 to -37	-37 to -38

Notes:

1. Northing and easting based on North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.
2. All elevations, depths, and intervals are in feet CRD.
3. *Based on June 2007 bathymetry survey.

Table 2 - Sampling Scheme
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Core Sample Location	Approximate Mudline Elevation*	Dredge Prism			NSM	
		Sample Interval	Individual Sample	Composite Sample for Analysis	Sample Interval	Sample ID for Analysis
Berth 601						
T601-C1	-36	-36 to -37	T601-C1-MD	T601-MD	-37 to -38	T601-C1-Z
T601-C2	-31.5	-31.5 to -37	T601-C2-MD		-37 to -38	T601-C2-Z
T601-C3	-29.5	-29.5 to -37	T601-C3-MD		-37 to -38	T601-C3-Z
Berth 607						
T607-C4	-32	-32 to -37	T607-C4-MD	T607-MD	-37 to -38	T607-C4-Z
T607-C5	-35.5	-35.5 to -37	T607-C5-MD		-37 to -38	T607-C5-Z
T607-C6	-33.5	-33.5 to -37	T607-C6-MD		-37 to -38	T607-C6-Z

Notes:

1. Berths 601 and 607 are to be dredged to an average depth of -37 feet Columbia River Datum (CRD).
2. Shaded samples submitted for analysis. All others archived (frozen) at the laboratory.
3. *Based on June 2007 bathymetry survey.

Table 3 - Grain Size Distributions
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Berth Sediment Horizon Sample ID	601				607			
	Prism	NSM			Prism	NSM		
	T601-MD	T601-C1-Z	T601-C2-Z	T601-C3-Z	T607-MD	T607-C4-Z	T607-C5-Z	T607-C6-Z
Grain Size in %								
Gravel	0.2	0.2	0.2	0.1	0.4	0.2	0.6	1.6
Very Coarse Sand	0.3	0.2	0.5	0.2	0.5	0.3	0.4	6.4
Coarse Sand	0.5	0.2	1.3	2.4	0.9	0.4	0.6	18.9
Medium Sand	4.2	0.4	6.8	11.3	4.3	1.9	2.7	35.3
Fine Sand	14.5	2.6	14.9	59.1	10.1	6.5	10.1	12.2
Very Fine Sand	20.9	23.8	23.3	15.0	29.2	21.5	34.4	6.9
Coarse Silt	21.2	32.3	21.0	5.5	26.7	28.8	26.5	8.4
Medium Silt	16.0	16.4	13.3	2.6	13.5	18.7	11.3	3.8
Fine Silt	9.2	10.3	7.3	1.6	5.3	8.9	5.3	2.3
Very Fine Silt	4.7	5.3	4.3	0.7	2.6	4.5	2.6	1.1
8-9 Phi Clay	2.8	2.8	2.5	0.5	2.1	2.9	1.8	0.9
9-10 Phi Clay	2.1	2.1	1.9	0.4	1.6	2.1	1.5	0.9
> 10 Phi Clay	3.4	3.4	2.7	0.6	2.7	3.3	2.1	1.2
Total Fines	59.5	72.6	53.0	12.0	54.5	69.2	51.2	18.6
Material Description	Slightly clayey, very sandy SILT	Slightly clayey, sandy SILT	Slightly clayey, very silty SAND	Slightly silty SAND	Slightly clayey, very sandy SILT	Slightly clayey, sandy SILT	Slightly clayey, very silty SAND	Slightly silty SAND

Table 4 - Analytical Results for Sediment Samples
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Berth Sediment Horizon Lab ID Sample ID	601				607				Screening Level ¹
	Prism	NSM			Prism	NSM			
	MN43G	MN43D	MN43E	MN43F	MN42G	MN42D	MN42E	MN42F	
	T601-MD	T601-C1-Z	T601-C2-Z	T601-C3-Z	T607-MD	T607-C4-Z	T607-C5-Z	T607-C6-Z	
Conventional Parameters									
Total Solids (%)	63	64.4	65.1	79.9	64	65.7	69.4	80.1	--
Total Organic Carbon (%)	1.04	0.947	0.971	0.252	0.96	1.02	0.796	0.941	--
Ammonia (mg/kg)	112	137	176	12.8	120	179	112	25.8	--
Total Sulfides (mg/kg)	61.7	34.1	36.6	1.33 U	72	56.8	49.7	20.3	--
Metals in mg/kg									
Antimony	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	150 ²
Arsenic	3.1	3.1	3.3	1.5	3.1	3.8	3.0	1.4	20
Cadmium	0.8	0.7	0.9	0.3 U	0.8	0.9	0.9	0.4	1.1
Chromium	18.7	18.5	17.9	15.0	17.1	18.9	17.6	11.8	95
Copper	24.7	25.8	21.8	10.4	37.4	27.5	30.4	13.7	80
Lead	10	10	12	4	9	12	11	5	340
Mercury	0.09	0.08	0.08	0.05 U	0.08	0.08	0.06	0.05 U	0.28
Nickel	16	16	16	13	15	17	16	10	60
Silver	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	2.0
Zinc	115	105	126	49	114	135	115	56	130
Butyltins in µg/kg									
Tributyltin (TBT) Dry Weight	2.3 J	3.6 U	3.3 J	3.6 U	160	4.5	350	5.2	75
SVOCs in µg/kg									
LPAHs									
Naphthalene	4.9 U	4.8 U	5 U	4.9 U	5 U	5 U	4.8 U	5 U	500
Acenaphthylene	4.9 U	4.8 U	5 U	4.9 U	5 U	5 U	4.8 U	5 U	470
Acenaphthene	4.9 U	4.8 U	5 U	4.9 U	100	32	32	30	1,100
Fluorene	4.9 U	4.8 U	5 U	4.9 U	95	13	34	11 J	1,000
Phenanthrene	7.4	20	29	4.9 U	270	66	330	61	6,100
Anthracene	4.9 U	4.8 U	5 U	4.9 U	50	7.9	41	5 U	1,200
2-Methylnaphthalene	4.9 U	4.8 U	5 U	4.9 U	5.9	5 U	4.8 U	5 U	470
Total LPAHs	7.4	20	29	4.9 U	521	119	437	102	6,600
HPAHs									
Fluoranthene	29	21	47	4.9 U	210	96	490	51	11,000
Pyrene	27	22	42	4.9 U	200	78	360	44	8,800
Benzo(a)anthracene	8.8	8.2	17	4.9 U	72	45	120	12	4,300
Chrysene	22	13	32	4.9 U	120	77	120	10	5,900
Benzo(b)fluoranthene	20	11	27	4.9 U	51	40	89	14	--
Benzo(k)fluoranthene	16 J	11	24	4.9 U	85	54	97	5 U	--
Benzo(b+k)fluoranthenes	36	22	51	4.9 U	136	94	186	14	600
Benzo(a)pyrene	9.8	9.7	23	4.9 U	60	36	81	7.5	3,300
Indeno(1,2,3-cd)pyrene	5.9	5.3	12	4.9 U	27	28	46	5 U	4,100
Dibenz(a,h)anthracene	4.9 U	4.8 U	5 U	4.9 U	7.9	5 U	13 J	5 U	800
Benzo(g,h,i)perylene	6.9	7.3	14	4.9 U	25	23	36	5 U	4,000
Total HPAHs	145	109	238	4.9 U	858	477	1452	139	31,000
Chlorinated Hydrocarbons									
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	110 ²
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	35 ²
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	31 ²
Hexachlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	22 ²
Phthalates									
Dimethyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	46
Diethyl Phthalate	20 U	20 U	20 U	20 U	20 U	76	20 U	20 U	200 ²
Di-n-butyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	1,400 ²
Butyl Benzyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	260
Bis(2-ethylhexyl) Phthalate	23	13 J	15 J	20	76	23	32	12 J	220
Di-n-octyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	26
Phenols									
Phenol	29	40	40	20 U	20 U	30	20 U	20 U	420 ²
2-Methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	63 ²
4-Methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	670 ²
2,4-Dimethylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	29 ²
Pentachlorophenol (PCP)	98 U	100 U	100 U	100 U	98 U	98 U	99 U	98 U	400 ²

Please refer to notes on the last page of this table.

Table 4 - Analytical Results for Sediment Samples
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Berth Sediment Horizon Lab ID Sample ID	601				607				Screening Level ¹	
	Prism	NSM			Prism	NSM				
	MN43G T601-MD	MN43D T601-C1-Z	MN43E T601-C2-Z	MN43F T601-C3-Z	MN42G T607-MD	MN42D T607-C4-Z	MN42E T607-C5-Z	MN42F T607-C6-Z		
SVOCs in µg/kg (Cont.)										
<i>Miscellaneous Extractables</i>										
Benzyl Alcohol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	57 ²	
Benzoic Acid	350	470	360	200 U	230	360	280	140 J	650 ²	
Dibenzofuran	4.9 U	4.8 U	5.0 U	4.9 U	37	5.0 U	16 J	5.0 U	400	
Hexachlorobutadiene	7.9*/20 U	8.1*/20 U	8.1*/20 U	8.1*/20 U	7.9*/20 U	8.0*/20 U	8.0*/20 U	8.0*/20 U	11 ²	
n-Nitrosodiphenylamine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	28 ²	
Pesticides in µg/kg										
4,4'-DDE	3.3 J	3.7	2.7	2.0 U	2.0 J	3.3	2.3	2.0 U	9 ²	
4,4'-DDD	4.4 J	2.7	2.4	2.0 U	3.9 U	2.0 J	2.0 U	2.0 U	16 ²	
4,4'-DDT	3.9 U	2.0 U	2.0 U	2.0 U	3.9 U	1.6 J	2.0 U	2.0 U	12 ²	
Total DDT	7.7 J	6.4	5.1	2.0 U	2.0 J	6.9 J	2.3	2.0 U	--	
Aldrin	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	0.98 U	0.99 U	0.98 U	9.5 ²	
alpha-Chlordane	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	0.98 U	0.99 U	0.98 U	2.8 ²	
Dieldrin	1.6*/3.9 U	0.84*/2.0 U	0.84*/2.0 U	0.84*/2.0 U	1.6*/3.9 U	0.83*/2.0 U	0.83*/2.0 U	0.83*/2.0 U	1.9 ²	
Heptachlor	0.79*/2.0 U	1.0 U	1.0 U	1.0 U	0.79*/2.0 U	0.98 U	0.99 U	0.98 U	1.5 ²	
gamma-BHC (Lindane)	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	0.98 U	0.99 U	0.98 U	--	
PCBs in µg/kg										
Aroclor 1016	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1221	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1232	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1242	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1248	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1254	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	9.8 U	9.8 U	--	
Aroclor 1260	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	15 Y	9.8 U	--	
Total PCBs	9.8 U	10 U	10 U	10 U	9.8 U	9.8 U	15 Y	9.8 U	60	

Note:

1. Screening levels are as follows:

¹ Screening levels are SEF's Freshwater Screening Level 1 (no adverse effects) (Corps, et al., 2006; Table 7-1, revised 10/20/06), unless otherwise indicated by Note 2.

² No freshwater SL listed in SEF; values presented are marine SL1 from Table 7-1 of the SEF (Corps, et al., 2006; table revised 10/20/06).

2. PAH concentrations are the higher of the EPA Method 8270D-SIM and EPA Method 8270D analyses.

3. Bolded values are detected concentrations.

4. Shaded value is a concentration exceeding its respective SL.

5. For undetected compounds, method reporting limits are shown unless otherwise indicated.

6. *Method detection limit (MDL).

7. -- = Not analyzed or not available.

8. NSM = New surface material (i.e., leave surface).

9. J = Estimated concentration between MDL and method reporting limit (MRL).

10. U = Not detected at the indicated MDL or MRL.

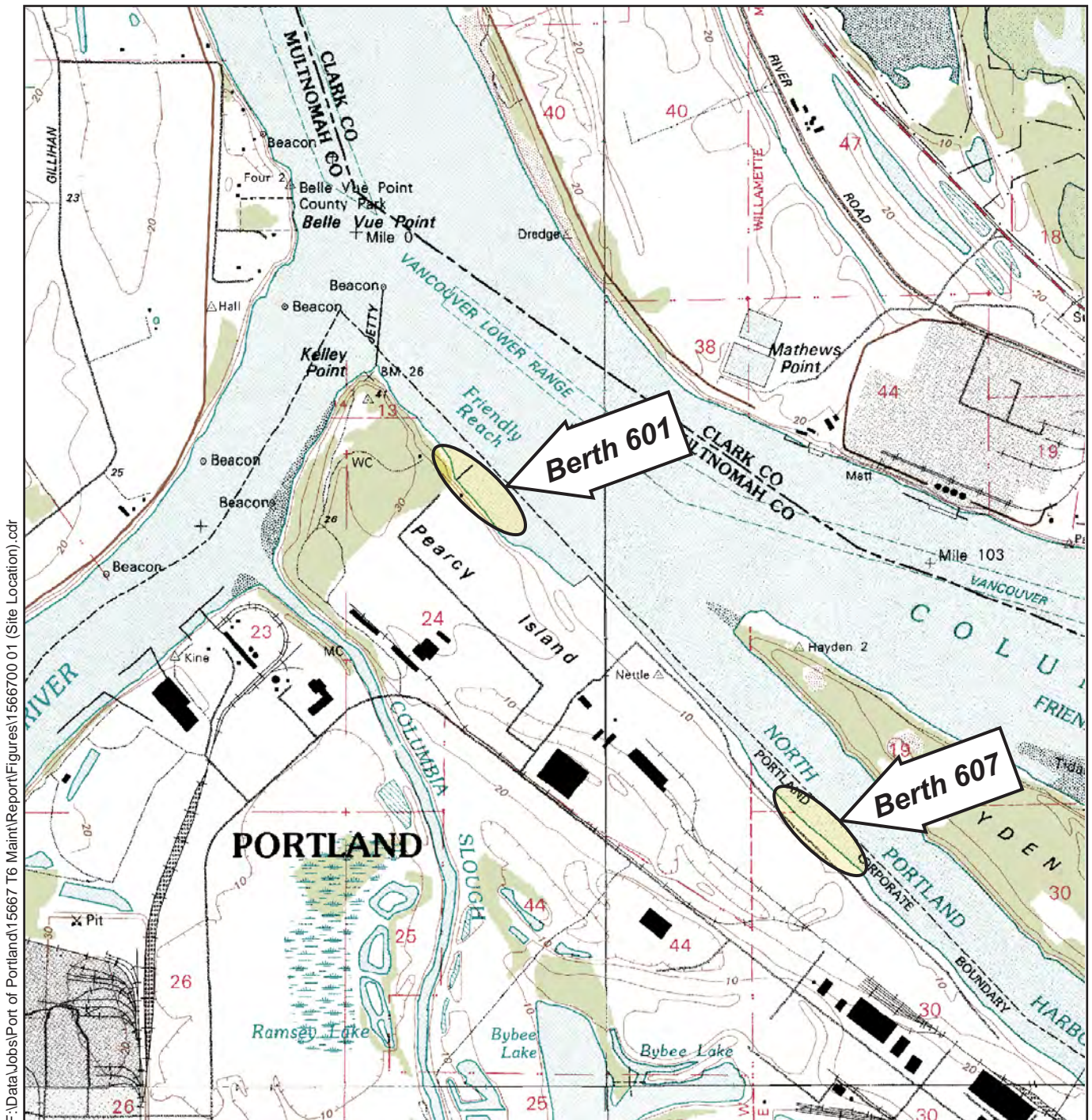
11. UJ = Estimated MRL (see Appendix B).

12. Y = Not detected at a MRL that was raised due to chromatographic interference.

Site Location Map

Terminal 6 Sediment Characterization

N Marine Drive, Portland, Oregon



Source: Base map prepared from the USGS 7.5-minute quadrangle of Sauvie Island, Oregon, dated 1990.



0 2,000 4,000



Scale in Feet
Contour Interval 10 Feet



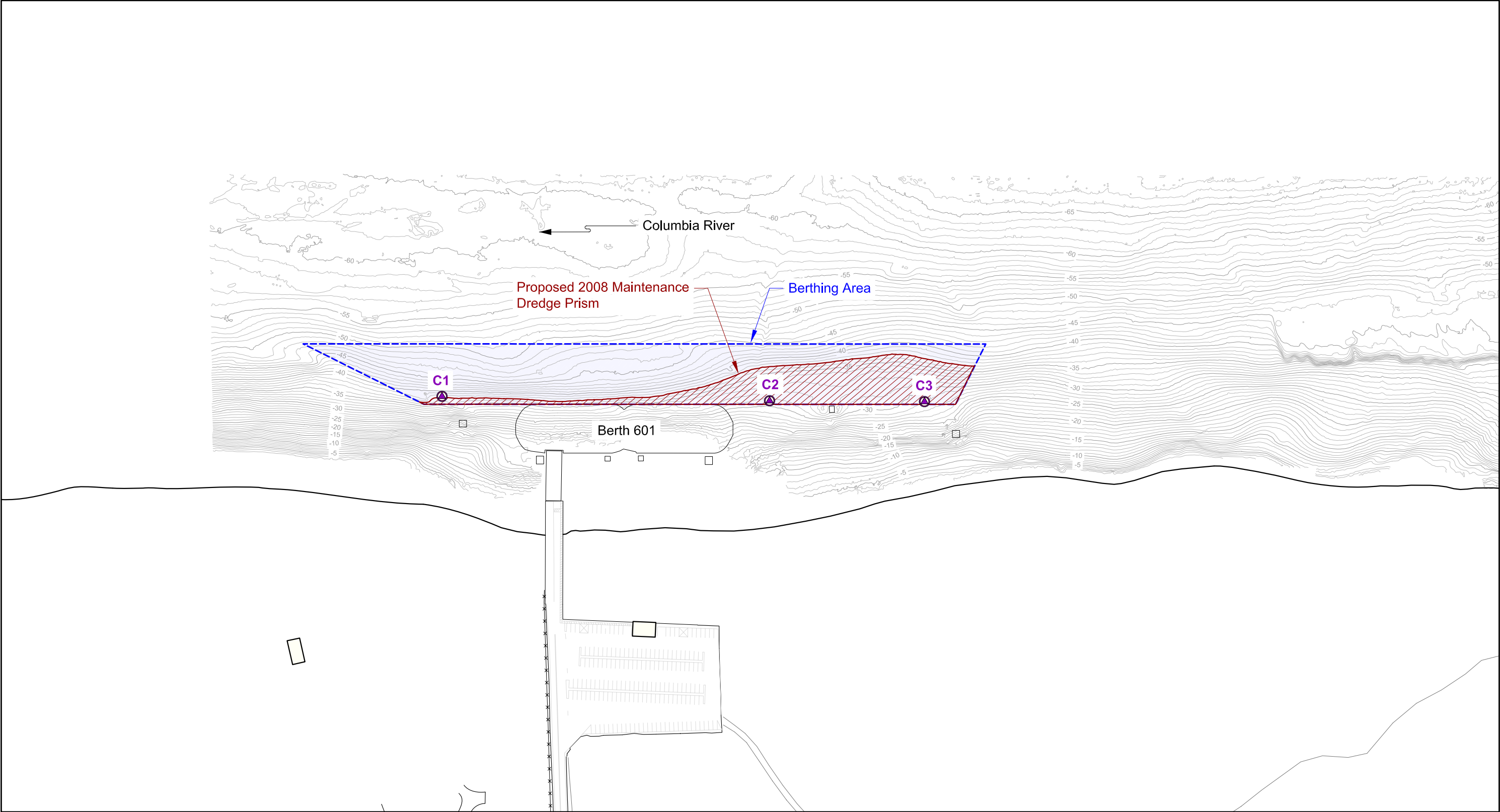
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Figure 1

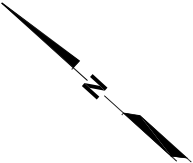
Berth 601 and Core Sampling Locations
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon



Source: Port of Portland.

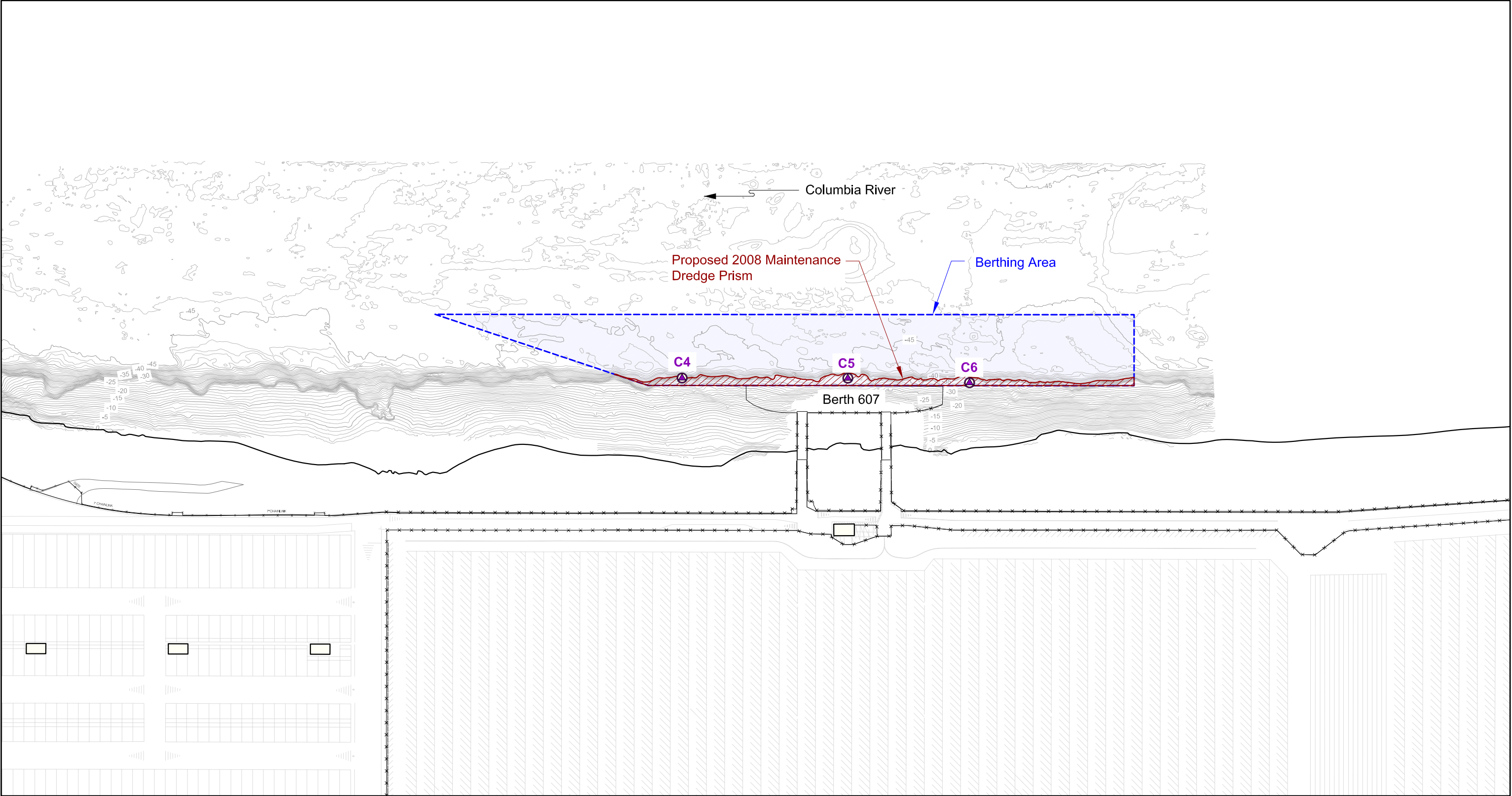
- C1 Core Sampling Location and Number
- Contours Based on a 2007 Bathymetric Survey in Feet (CRD)

Yellow Shading Represents Building



0 200 400
Scale in Feet

Berth 607 and Core Sampling Locations
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

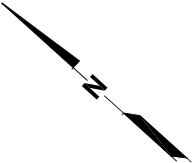


F:\Data\Jobs\Port of Portland\15667 T6 Maint\Report\Figures\1566700 02-03 (Site Plans).dwg

Source: Port of Portland.

C4 Core Sampling Location and Number
Contours Based on a 2007 Bathymetric Survey in Feet (CRD)

Yellow Shading Represents Building



0 200 400
Scale in Feet

APPENDIX A SEDIMENT CORE LOGS

Key for Soil/Sediment Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.

Soil density/consistency in other explorations is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSE
Density		Consistency		
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

Estimated Percentage

Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Legends

Sample Acceptability Criteria:

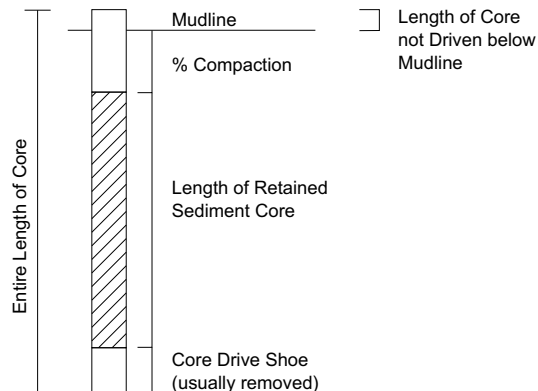
1. Overlying water is present
2. Water has low turbidity
3. Sampler is not overfilled
4. Surface is flat
5. Penetration depth is acceptable
6. Compaction is less than 25 percent
7. Core tube is intact

Estimated Percentage of Other Minor Constituents

(i.e.. shells, wood, organics, plastic, metal brick, refuse)

Description	Estimated Percentage
Dusting	Trace on Surface
Trace	Discernible
Scattered	0-5
Moderate	5-20
Substantial	20-50
Major Constituent	>50

Core Observations



Test Symbols

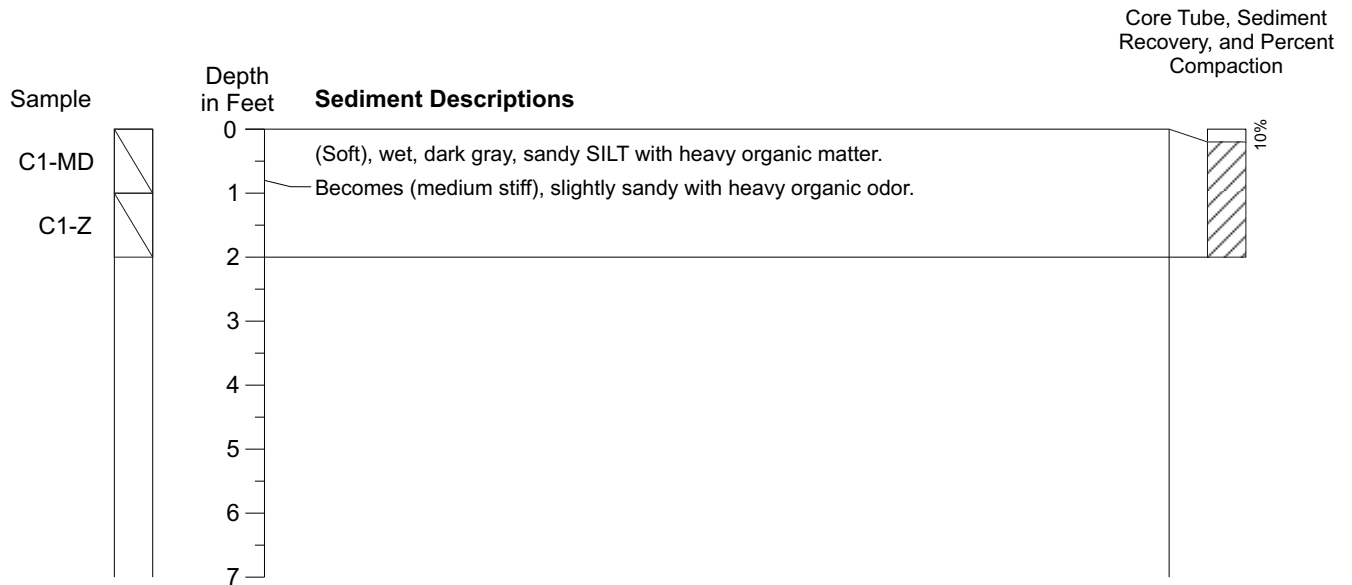
CHEM	Chemical Testing
GS	Grain Size
ARCH	Archive
	Continuous Vibracore
AL	Atterberg Limits
SP GR	Specific Gravity

———— Major Sediment Unit Contacts
----- Minor Sediment Unit Contacts

Sediment Core Log 601-C1

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 1.80
 Total Drive Depth below Mudline in Feet: 2.0

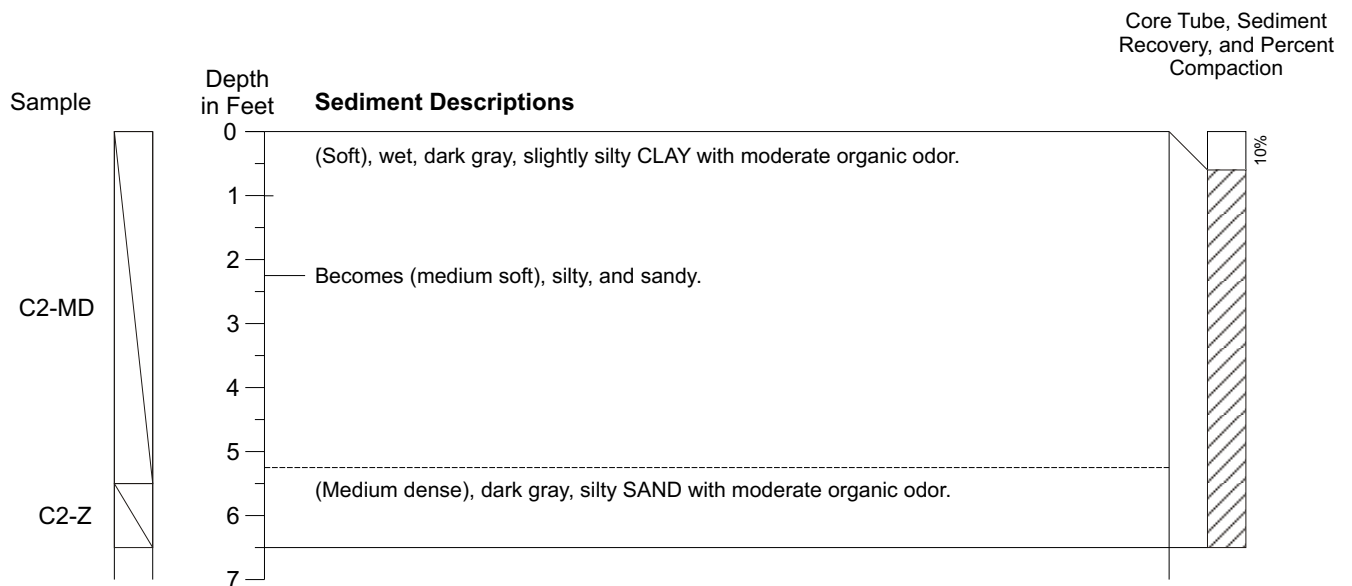
Northing: 730460.76
 Easting: 7624601.14
 Approximate Mudline Elevation in Feet (CRD): -36.0
 Core Tube Length in Feet: Continuous



Sediment Core Log 601-C2

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 5.9
 Total Drive Depth below Mudline in Feet: 6.5

Northing: 729951.77
 Easting: 7625048.84
 Approximate Mudline Elevation in Feet (CRD): -31.5
 Core Tube Length in Feet: Continuous



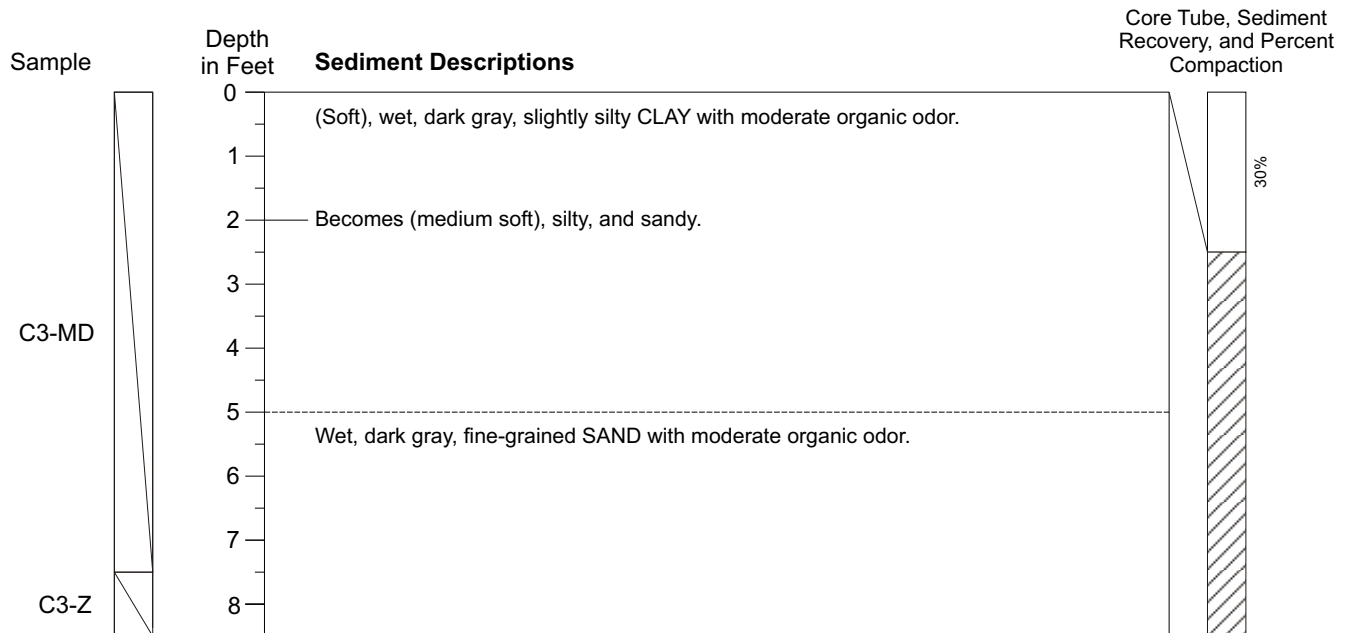
Notes:

- Sediment contacts are inferred and actual contacts may vary.
- CRD = Columbia River Datum.
- Northing and easting are based on the North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.

Sediment Core Log 601-C3

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 6.0
 Total Drive Depth below Mudline in Feet: 8.5

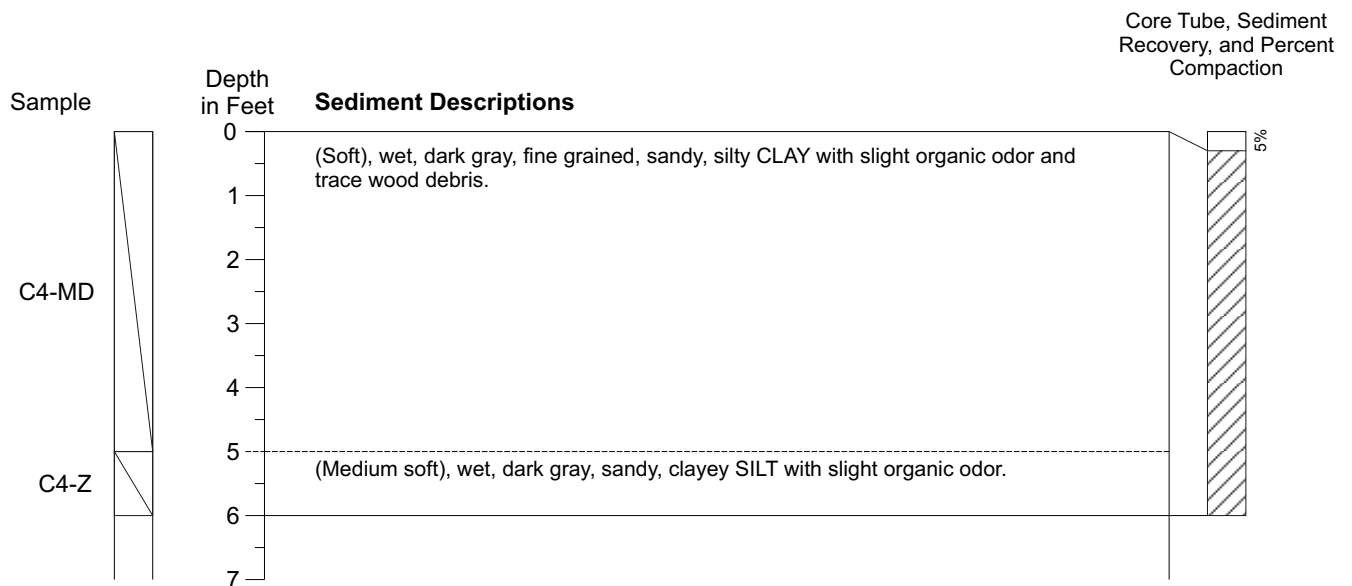
Northing: 729712.76
 Easting: 7625262.47
 Approximate Mudline Elevation in Feet (CRD): -29.5
 Core Tube Length in Feet: Continuous



Sediment Core Log 607-C4

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 5.7
 Total Drive Depth below Mudline in Feet: 6.0

Northing: 725430.61
 Easting: 7629130.53
 Approximate Mudline Elevation in Feet (CRD): -32.0
 Core Tube Length in Feet: Continuous



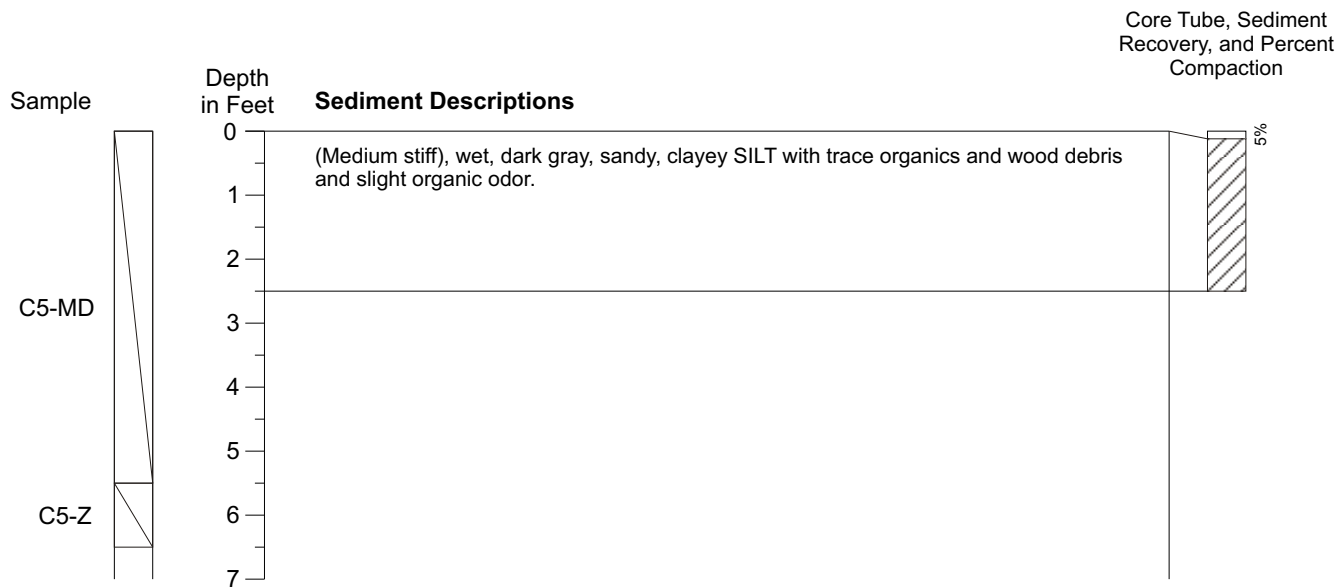
Notes:

- Sediment contacts are inferred and actual contacts may vary.
- CRD = Columbia River Datum.
- Northing and easting are based on the North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.

Sediment Core Log 607-C5

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 2.38
 Total Drive Depth below Mudline in Feet: 2.5

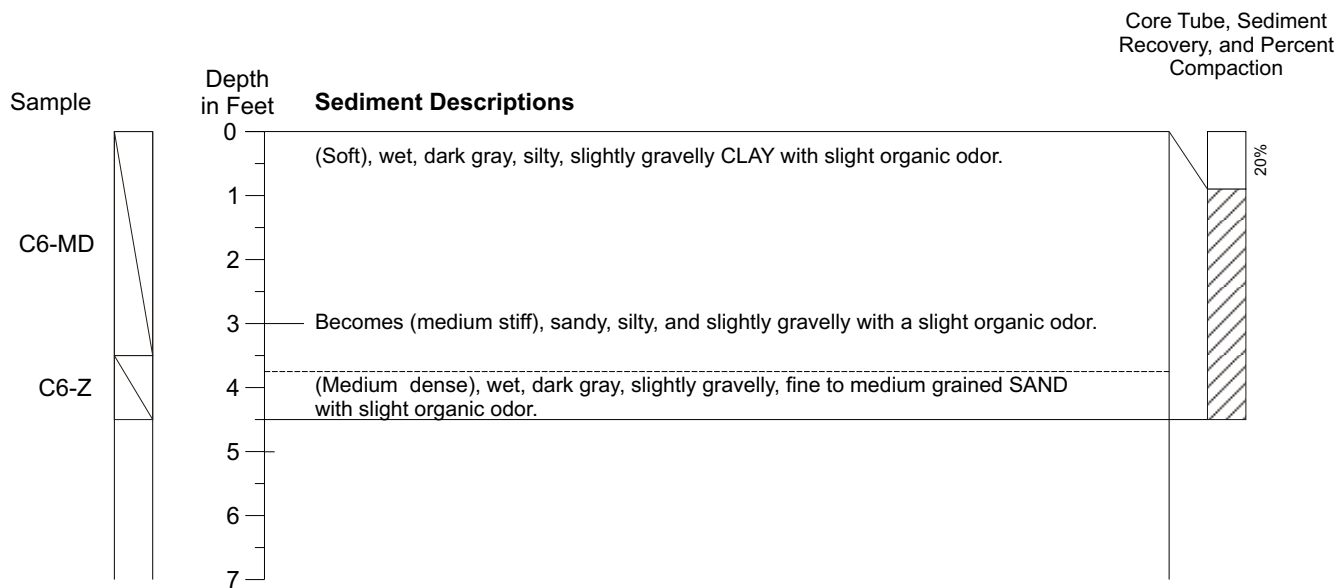
Northing: 725170.81
 Easting: 7629365.01
 Approximate Mudline Elevation in Feet (CRD): -35.5
 Core Tube Length in Feet: Continuous



Sediment Core Log 607-C6

Type of Sample: 4-inch Vibracore
 Date: 3/12/08
 Recovery Length in Feet: 3.6
 Total Drive Depth below Mudline in Feet: 4.5

Northing: 724973.72
 Easting: 7629530.14
 Approximate Mudline Elevation in Feet (CRD): -33.5
 Core Tube Length in Feet: Continuous



Notes:

- Sediment contacts are inferred and actual contacts may vary.
- CRD = Columbia River Datum.
- Northing and easting are based on the North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.



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Figure A-4

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APPENDIX B

QUALITY ASSURANCE REVIEW

APPENDIX B

QUALITY ASSURANCE REPORT

This appendix documents the results of a quality assurance (QA) review of the analytical data for dredge prism and new surface material (NSM) samples collected during the March 12, 2008, sediment characterization at the Berths 601 and 607. Field procedures used for sample collection are discussed in our Sampling and Analysis Plan (SAP; Hart Crowser, 2008). Hart Crowser submitted sediment samples to Analytical Resources, Inc. (ARI), of Tukwila, Washington, for chemical analysis. Copies of the analytical laboratory reports are included in Appendix C. Upon review, the analytical data are valid for their intended use. A Data Completeness (QA1) checklist is included as Table B-1 in this appendix.

The quality assurance review included examination and validation of the laboratories' summary report, including:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Standard reference material (SRM) recoveries;
- Matrix spike and matrix spike duplicate (MS/MSD) recoveries; and
- Laboratory duplicate relative percent difference (RPD).

The QA review did not include a review of raw data.

ANALYTICAL METHODS AND DETECTION LIMITS

Chemical Analyses on Sediment

A total of 14 sediment samples were collected from the six cores obtained during the sediment characterization fieldwork in March 2008 (i.e., a dredge prism and a NSM sample from each core and one composite sample from each of the two dredge material management units [DMMUs]). To assess the chemical quality of the DMMUs and future NSM after maintenance dredging, the two composite samples and six NSM samples were analyzed for the following:

- Grain size by ASTM D 422M;

- Total solids by EPA Method 160.3;
- Total organic carbon (TOC) by Plumb (1981);
- Ammonia by EPA Method 350.1M;
- Sulfide by EPA Method 376.2;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Method 200.8/6010B/7471A;
- Tributyltin (TBT) by Krone, et al. (written 1988; published 1989);
- Polynuclear aromatic hydrocarbon (PAHs) by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A; and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082.

These analytical test methods were the analytical methods specified in the SAP (Hart Crowser, 2008), except analysis for arsenic and antimony by EPA Method 200.8 was used to obtain lower method reporting limits (MRLs) than EPA Method 6010B. Methods 200.8 and 6010B both use inductively coupled plasma to atomize and ionize the metals in the sample, but Method 200.8 follows with mass spectrometer to separate the metal ions for quantification.

Detection and Reporting Limits

Method detection limits (MDLs) are the minimum concentration of a chemical compound that can be measured and reported that the compound is present, and is based on instrumentation abilities and sample matrix. MRLs are set by the laboratory and are based on the low standard of the initial calibration curve or low-level calibration check standard, and represent the concentration that can be accurately quantified. In some cases, the MRL is raised due to high concentrations of analytes in the samples or matrix interferences. MRLs were consistent with industry standards.

Table 4 of this report lists the MRLs for undetected samples. For the majority of compounds, MRLs were below Sediment Evaluation Framework (SEF) screening levels (SLs). For dieldrin, heptachlor, and hexachlorobutadiene, their MRLs were above the SL; in these cases, their MDLs are also listed and are below their SLs. Upon review, MDLs and MRLs are sufficient in achieving SEF SLs. As presented in Appendix D, other SLs are available for screening sediment data; some of which are lower than SEF SLs. Additional MDLs are therefore indicated in Table D-1 for those compounds that have MRLs above one of these other SLs.

QA REVIEW RESULTS

The laboratory provided QC sample results, which underwent a QA review. QC samples were consistent with those specified in the SAP (Hart Crowser, 2008) to evaluate precision, accuracy, representativeness, comparability, and completeness. Upon review, the sample data and laboratory QC data were found to be suitable for their intended use in determining the chemical quality of sediments.

Physical and Chemical Analysis

The following section summarizes, by analyte or test, the results of our QA review of the analytical data.

Grain Size. Holding times were met. Samples were run in one batch along with triplicate analyses on one sample. QA ratios were acceptable. Results were reported to 0.1 percent for each sieve fraction. The laboratory noted that samples might contain organic matter, so the reported values are the “apparent” grain size distribution.

Total Solids. Holding times were met. No method blank contamination was detected. The laboratory duplicate RPD, reported for the Berth 607 analyses, was acceptable (samples from Berth 601 were also analyzed with Berth 607 samples).

TOC. Holding times were met. No method blank contamination was detected. The LCS and SRM recoveries were within control limits. The MS recovery and the laboratory duplicate RPD, reported for the Berth 607 analyses, were acceptable (samples from Berth 601 were also analyzed with Berth 607 samples).

Ammonia. Holding times were met. No method blank contamination was detected. The SRM recovery was within control limits. The MS recovery and the laboratory duplicate RPD, reported for the Berth 607 analyses, were acceptable (samples from Berth 601 were also analyzed with Berth 607 samples).

Sulfide. Holding times were met. No method blank contamination was detected. The LCS and SRM recoveries were within control limits. MS recovery and the laboratory duplicate RPD, reported for the Berth 607 analyses, were acceptable (samples from Berth 601 were also analyzed with Berth 607 samples).

Total Metals. Holding times were met. No method blank contamination was detected. LCS recoveries were within control limits for all elements. MS recoveries were within control limits with the following exception: antimony had a low recovery (2.7 percent). Results for antimony in the associated samples were qualified as estimated (U)). The laboratory duplicate RPD was acceptable.

ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria for both reports.

Tributyltin. Holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. MS recoveries were within laboratory control limits for TBT; however, recoveries for dibutyltin and butyltin were below the control limits for the MS, but within the control limits for the MSD. As the compounds were not target analytes, no samples were qualified. ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria.

PAHs. Holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS recoveries were within laboratory control limits. ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria.

SVOCs. Holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS recoveries were within laboratory control limits. ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria.

Organochlorine Pesticides. Holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS recoveries were within laboratory control limits. ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria.

PCBs. Holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS recoveries were within laboratory control limits. ARI indicated in its case narrative that initial and continuing calibrations were within acceptance criteria.

Sample Integrity

Samples were collected in accordance with the SAP, following quality control procedures to ensure that sample data were representative of site conditions. Samples were sent via overnight courier to ARI for analysis. Chain of custody was maintained at all times. When received by the laboratory, the receiving temperature of the cooler was within the 2 to 6 °C acceptance criteria. Samples T601-C3-MD, T607-C6-MD, T607-C6-Z, and T607-MD, were received at the laboratory with cracked jar lids. The lids were replaced at the laboratory, and no samples were qualified. Sediment samples that were not analyzed were archived (frozen) at the time of receipt at ARI.

Table B-1 - QA1 Data Checklist
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

	Test Sediment	Reference Sediment	Control Sediment	Water Control
Sample Locations and Compositing				
Latitude and Longitude (to nearest 0.1 second)	NAD 83	N/A	N/A	N/A
NAD 1983 HARN (requirement for SEDQUAL)	Yes	N/A	N/A	N/A
Station Name (e.g. Carr Inlet)	Yes	N/A	N/A	N/A
Water depth (corrected to MLLW)	Bathymetric	N/A		
Drawing showing sampling locations and ID numbers	Yes	N/A	N/A	N/A
Compositing scheme (sampling locations/depths for composites)	Yes	N/A	N/A	N/A
Sampling method	Yes	N/A	N/A	N/A
Sampling dates	Yes	N/A		
Estimated volume of dredged material represented by each DMMU	Yes	N/A	N/A	N/A
Positioning method	Yes	N/A	N/A	N/A
Sediment Conventionals				
Preparation and analysis methods	Yes	N/A	N/A	N/A
Sediment conventional data and QA/QC qualifiers	Yes	N/A	N/A	N/A
QA qualifier code definitions	Yes	N/A	N/A	N/A
Units (dry weight except total solids)	Yes	N/A	N/A	N/A
Method blank data (sulfides, ammonia, TOC)	Yes	N/A	N/A	N/A
Method blank units (dry weight)	Yes	N/A	N/A	N/A
Analysis dates (sediment conventionals, blanks, TOC CRM)	Yes	N/A	N/A	N/A
TOC CRM ID	Yes	N/A	N/A	N/A
TOC CRM analysis data	Yes	N/A	N/A	N/A
TOC CRM target values	Yes	N/A	N/A	N/A
Grain Size Analysis				
Fine grain analysis method	Yes	N/A	N/A	N/A
Analysis dates	Yes	N/A	N/A	N/A
Triplicate for each batch	Yes	N/A	N/A	N/A
Grain size data (complete sieve and phi size distribution)	Yes	N/A	N/A	N/A

	Metals	SVOCs/ PAHs	Pesticides/ PCBs	VOCs
Extraction/digestion method				N/A
Extraction/digestion dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A
Analysis method	Yes	Yes	Yes	N/A
Data and QA qualifier included for:				
Test sediments	Yes	Yes	Yes	N/A
Reference materials including 95% confidence interval (each batch)				N/A
Method blanks (each batch)	Yes	Yes	Yes	N/A
Matrix spikes (each batch)	Yes	Yes	Yes	N/A
Matrix spike added (dry weight basis)	Yes	Yes	Yes	N/A
Replicates (each batch)	Yes			
Units (dry weight)	Yes	Yes	Yes	N/A
Method blank units (dry weight)	Yes	Yes	Yes	N/A
QA/QC qualifier definitions	Yes	Yes	Yes	N/A
Surrogate recovery for test sediment, blank, matrix spike, ref. material	Yes (TBT)	Yes	Yes	N/A
Analysis dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A

Please refer to notes at the end of this table.

Table B-1 - QA1 Data Checklist
Terminal 2 Sediment Characterization
Portland, Oregon

Notes:

QA Checklist based on Figures 12-2 and 12-3 of the SEF (Corps, et al., 2006).

Shaded boxes indicated those type of data are not applicable for that column.

N/A = Not applicable or not analyzed.

Acronyms and Abbreviations:

CRM = Control Reference Material

DMMU = Dredge Material Management Unit

MLLW = Mean lower low water

NAD = North American Datum

PAHs = Polynuclear aromatic hydrocarbons

PCBs = Polychlorinated biphenyls

QA = Quality assurance

QC = Quality control

SEF = Sediment evaluation framework

SVOCs = Semivolatile organic compounds

TBT = Tributyltin

TOC = Total organic carbon

VOCs = Volatile organic compounds

APPENDIX C

ANALYTICAL LABORATORY REPORTS



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 28, 2008

Mr. Rick Ernst
Hart Crowser, Inc.
5 Centerpointe Dr #240
Lake Oswego, OR 97035

RE: Project: T6- Berth 601, 156671 T2
ARI Job No: MN43

Dear Mr. Ernst:

Please find enclosed the original chain of custody documentation and the analytical results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted seven sediment samples on March 14, 2008. The samples were received in good condition at 3.6°C. There were no discrepancies between the sample containers' labels and the COC. Three samples have been placed on hold pending further instructions.

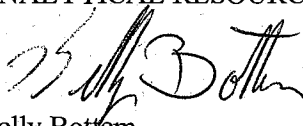
The samples were analyzed for PSDDA PCBs, TBT, Pesticides, SIM PNAs, PSDDA SVOA, TOC, TS, Sulfide, Ammonia, Grainsize and Total Metals, as requested on the COC.

Please reference the Case Narrative for analytical details associated with this project.

An electronic copy of these reports and the supporting data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Respectfully,

ANALYTICAL RESOURCES, INC.


Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

Enclosures

cc: files MN43

**Chain of Custody
Documentation**

**prepared
for**

HART CROWSER, INC.

Project: Port of Portland T6-Berth 601, 15667-T2

ARI JOB NO: MN43

**prepared
by**

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: MN43	Turn-around Requested: Standard
ARI Client Company: Hart Crower	Phone: 503-620-7284
Client Contact: Rick Ernst	
Client Project Name: Port of Portland TLE Berth 1601	
Client Project #: 1566712	Samplers: L18GZOVEX

Page: 1 of 1	
Date: 3/12/08	Ice Present? y partially melted
No. of Coolers: 1	Cooler Temps: 3.6



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments	
					Archival Freezer	Grain-Size	SEF 10 Metals 6020/7471	TOC/TS/TPH/ NH ₃ /Sulfides	TBT	PAHs 8270-STM	SUOLs 8270	PCB/PEST. 8081A/8082		
T601-C1-MD	3/12/08	1320	S	2	X									
T601-C2-MD	3/12/08	1200	S	2	X									
T601-C3-MD	3/12/08	1415	S	2	X									
T601-C1-Z	3/12/08	1320	S	5		X	X	X	X	X	X	X	Archival left over sed. most	
T601-C2-Z	3/12/08	1200	S	5		X	X	X	X	X	X	X		
T601-C3-Z	3/12/08	1415	S	5		X	X	X	X	X	X	X		
T601-MD	3/12/08	1430	S	9		X	X	X	X	X	X	X		

Comments/Special Instructions	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>E Joshi</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: L18GZOVEX	Printed Name: E JOSHI	Printed Name:	Printed Name:
	Company: Hart Crower	Company: ARI	Company:	Company:
	Date & Time: 3/12/08 1600	Date & Time: 3/14/08 0925	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Hart Crowser
COC No: NA
Assigned ARI Job No: MN43

Project Name: Port of Portland
Delivered by: UPS
Tracking No: _____

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 3.6 °C

Cooler Accepted by: sjoshi Date: 3/14/08 Time: 0925
Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? BW
Was sufficient ice used (if appropriate)? YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottle arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist) YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO

Samples Logged by: sjoshi Date: 3/17/08 Time: 1030
**** Notify Project Manager of discrepancies or concerns ****

Explain discrepancies or negative responses:

11602 jar for sample T601-C3-MD jar lid cracked
replaced at sample receiving.
Sample T601-MD time sampled on COC = 1430
time sampled on jars = 1420

By: aj

Date: 3/17/08

Case Narrative

**prepared
for**

HART CROWSER, INC.

Project: Port of Portland T6-Berth 601, 15667-T2

ARI JOB NO: MN43

**prepared
by**

Analytical Resources, Inc.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN43
March 28, 2008

Semivolatile Analysis (PSDDA 8270D):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/20/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated Semivolatile organics list.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries are in control.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Semivolatile SIM Analysis (8270D):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/19/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated SIM Semivolatile organics list.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries and RPDs were in control.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN43
March 28, 2008
Page 2

Tributyl Tin Analysis (GC/MS Krone):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated Tributyl Tins analysis.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries were in control.

PCB and Pesticides Analysis (PSDDA):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/20/08 and 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): All method blanks were free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the analyses.

LCS/LCSD (s): All percent recoveries and RPDs were in control.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN43
March 28, 2008
Page 3

Total Metals Analysis:

The samples were digested on 3/18/08 and the samples were analyzed between 3/20/08 and 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria.

Method Blank (s): The method blank was free of contamination

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries were in control.

The Matrix Spike is out of control low for Antimony for the total metals analysis on sample **T607-C4-Z**. All other spike recoveries are in control; therefore no further corrective action was taken.

General Chemistry Analyses

All General chemistry samples were analyzed within the method recommended holding time for the analyses.

Samples: No anomalies were encountered for these samples.

Method Blank(s): All method blanks were free of element contamination.

LCS/SRM/Replicate: All percent recoveries and RPDs were in control.



Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- NR Spiked compound recovery is not reported due to chromatographic interference
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for



- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser

Project No.: MN43

Client Project: Port of Portland T6 Berth 601 15667/T2

Case Narrative

1. Four samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch and one sample in the batch was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The data is provided in summary tables and plots.
4. There were no other noted anomalies in this project.

Approved by:

Taylor McKenzie
Title: Lead Technician

Date:

3-24-08

Data Summary Package

**prepared
for**

HART CROWSER, INC.

Project: Port of Portland T6-Berth 601, 15667-T2

ARI JOB NO: MN43

**prepared
by**

Analytical Resources, Inc.

SEMIVOLATILE ORGANICS

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: T601-C1-Z

SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 18:23

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 34.0%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	40
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.3	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.9	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.2	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	470
120-82-1	1,2,4-Trichlorobenzene	9.1	20	< 20 U
91-20-3	Naphthalene	8.7	20	< 20 U
87-68-3	Hexachlorobutadiene	8.1	20	< 20 U
91-57-6	2-Methylnaphthalene	8.2	20	< 20 U
131-11-3	Dimethylphthalate	7.7	20	< 20 U
208-96-8	Acenaphthylene	8.6	20	< 20 U
83-32-9	Acenaphthene	8.2	20	< 20 U
132-64-9	Dibenzofuran	7.5	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.9	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.7	20	< 20 U
118-74-1	Hexachlorobenzene	8.0	20	< 20 U
87-86-5	Pentachlorophenol	47	100	< 100 U
85-01-8	Phenanthrene	8.4	20	20
120-12-7	Anthracene	7.7	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.9	20	21
129-00-0	Pyrene	7.7	20	22
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.9	20	10 J
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	13 J
218-01-9	Chrysene	6.6	20	15 J
117-84-0	Di-n-Octyl phthalate	8.3	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.5	20	14 J
207-08-9	Benzo(k)fluoranthene	9.2	20	14 J
50-32-8	Benzo(a)pyrene	8.1	20	15 J
193-39-5	Indeno(1,2,3-cd)pyrene	8.6	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.5	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.7	20	< 20 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: T601-C1-Z
SAMPLE

Lab Sample ID: MN43D
LIMS ID: 08-5468
Matrix: Sediment
Date Analyzed: 03/20/08 18:23

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.2	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	67.2%	2-Fluorobiphenyl	74.0%
d14-p-Terphenyl	80.4%	d4-1,2-Dichlorobenzene	61.6%
d5-Phenol	69.6%	2-Fluorophenol	71.7%
2,4,6-Tribromophenol	82.9%	d4-2-Chlorophenol	72.3%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

Sample ID: T601-C2-Z
SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 18:55

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 30.4%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	40
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.3	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.9	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.2	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	360
120-82-1	1,2,4-Trichlorobenzene	9.1	20	< 20 U
91-20-3	Naphthalene	8.7	20	< 20 U
87-68-3	Hexachlorobutadiene	8.1	20	< 20 U
91-57-6	2-Methylnaphthalene	8.2	20	< 20 U
131-11-3	Dimethylphthalate	7.7	20	< 20 U
208-96-8	Acenaphthylene	8.6	20	< 20 U
83-32-9	Acenaphthene	8.2	20	< 20 U
132-64-9	Dibenzofuran	7.5	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.9	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.7	20	< 20 U
118-74-1	Hexachlorobenzene	8.0	20	< 20 U
87-86-5	Pentachlorophenol	47	100	< 100 U
85-01-8	Phenanthrene	8.4	20	29
120-12-7	Anthracene	7.7	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.9	20	47
129-00-0	Pyrene	7.7	20	42
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo (a) anthracene	5.9	20	18 J
117-81-7	bis (2-Ethylhexyl) phthalate	11	20	15 J
218-01-9	Chrysene	6.6	20	32
117-84-0	Di-n-Octyl phthalate	8.3	20	< 20 U
205-99-2	Benzo (b) fluoranthene	9.5	20	27
207-08-9	Benzo (k) fluoranthene	9.2	20	24
50-32-8	Benzo (a) pyrene	8.1	20	23
193-39-5	Indeno (1,2,3-cd) pyrene	8.6	20	11 J
53-70-3	Dibenz (a,h) anthracene	8.5	20	< 20 U
191-24-2	Benzo (g,h,i) perylene	6.7	20	10 J

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 2 of 2



Sample ID: T601-C2-Z

SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Date Analyzed: 03/20/08 18:55

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.2	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.0%	2-Fluorobiphenyl	82.8%
d14-p-Terphenyl	89.6%	d4-1,2-Dichlorobenzene	67.2%
d5-Phenol	77.1%	2-Fluorophenol	78.9%
2,4,6-Tribromophenol	95.7%	d4-2-Chlorophenol	80.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

Sample ID: T601-C3-Z
SAMPLE

Lab Sample ID: MN43F

LIMS ID: 08-5470

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 19:27

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 24.2%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.4	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.9	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.2	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	9.1	20	< 20 U
91-20-3	Naphthalene	8.7	20	< 20 U
87-68-3	Hexachlorobutadiene	8.1	20	< 20 U
91-57-6	2-Methylnaphthalene	8.2	20	< 20 U
131-11-3	Dimethylphthalate	7.8	20	< 20 U
208-96-8	Acenaphthylene	8.6	20	< 20 U
83-32-9	Acenaphthene	8.2	20	< 20 U
132-64-9	Dibenzofuran	7.6	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.9	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.7	20	< 20 U
118-74-1	Hexachlorobenzene	8.0	20	< 20 U
87-86-5	Pentachlorophenol	48	100	< 100 U
85-01-8	Phenanthrene	8.4	20	< 20 U
120-12-7	Anthracene	7.7	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.9	20	< 20 U
129-00-0	Pyrene	7.8	20	< 20 U
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.9	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	20
218-01-9	Chrysene	6.6	20	< 20 U
117-84-0	Di-n-Octyl phthalate	8.3	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.5	20	< 20 U
207-08-9	Benzo(k)fluoranthene	9.2	20	< 20 U
50-32-8	Benzo(a)pyrene	8.2	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	8.6	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.5	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.8	20	< 20 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: T601-C3-Z
SAMPLE

Lab Sample ID: MN43F
LIMS ID: 08-5470
Matrix: Sediment
Date Analyzed: 03/20/08 19:27

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.2	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.4%	2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	82.4%	d4-1,2-Dichlorobenzene	66.4%
d5-Phenol	69.1%	2-Fluorophenol	70.4%
2,4,6-Tribromophenol	75.7%	d4-2-Chlorophenol	72.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

Sample ID: T601-MD
SAMPLE

Lab Sample ID: MN43G

LIMS ID: 08-5471

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 19:59

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 34.3%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	29
541-73-1	1,3-Dichlorobenzene	7.3	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.2	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.7	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	12	20	< 20 U
67-72-1	Hexachloroethane	7.0	20	< 20 U
105-67-9	2,4-Dimethylphenol	14	20	< 20 U
65-85-0	Benzoic Acid	110	200	350
120-82-1	1,2,4-Trichlorobenzene	8.9	20	< 20 U
91-20-3	Naphthalene	8.5	20	< 20 U
87-68-3	Hexachlorobutadiene	7.9	20	< 20 U
91-57-6	2-Methylnaphthalene	8.0	20	< 20 U
131-11-3	Dimethylphthalate	7.6	20	< 20 U
208-96-8	Acenaphthylene	8.4	20	< 20 U
83-32-9	Acenaphthene	8.0	20	< 20 U
132-64-9	Dibenzofuran	7.4	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.7	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.5	20	< 20 U
118-74-1	Hexachlorobenzene	7.8	20	< 20 U
87-86-5	Pentachlorophenol	46	98	< 98 U
85-01-8	Phenanthrene	8.2	20	17 J
120-12-7	Anthracene	7.5	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.7	20	29
129-00-0	Pyrene	7.6	20	27
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.8	20	13 J
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	23
218-01-9	Chrysene	6.5	20	22
117-84-0	Di-n-Octyl phthalate	8.1	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.3	20	20
207-08-9	Benzo(k)fluoranthene	9.0	20	16 J
50-32-8	Benzo(a)pyrene	8.0	20	17 J
193-39-5	Indeno(1,2,3-cd)pyrene	8.4	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.3	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.6	20	< 20 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: T601-MD
SAMPLE

Lab Sample ID: MN43G
LIMS ID: 08-5471
Matrix: Sediment
Date Analyzed: 03/20/08 19:59

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.0	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	67.6%	2-Fluorobiphenyl	75.2%
d14-p-Terphenyl	84.0%	d4-1,2-Dichlorobenzene	62.4%
d5-Phenol	70.9%	2-Fluorophenol	71.5%
2,4,6-Tribromophenol	85.6%	d4-2-Chlorophenol	72.3%

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
MB-031808	68.0%	72.0%	89.2%	66.8%	75.7%	73.9%	81.9%	76.0%	0	
LCS-031808	69.6%	77.2%	89.6%	66.4%	77.3%	74.9%	87.7%	76.3%	0	
LCSD-031808	69.2%	74.0%	87.6%	66.4%	76.3%	73.9%	83.2%	75.5%	0	
T601-C1-Z	67.2%	74.0%	80.4%	61.6%	69.6%	71.7%	82.9%	72.3%	0	
T601-C2-Z	74.0%	82.8%	89.6%	67.2%	77.1%	78.9%	95.7%	80.0%	0	
T601-C3-Z	68.4%	73.6%	82.4%	66.4%	69.1%	70.4%	75.7%	72.0%	0	
T601-MD	67.6%	75.2%	84.0%	62.4%	70.9%	71.5%	85.6%	72.3%	0	

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 08-5468 to 08-5471

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

Sample ID: LCS-031808
LCS/LCSD

Lab Sample ID: LCS-031808

LIMS ID: 08-5468

Matrix: Sediment

 Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g

LCSD: 25.0 g

Date Analyzed LCS: 03/20/08 12:26

Final Extract Volume LCS: 0.5 mL

LCSD: 03/20/08 12:58

LCSD: 0.5 mL

Instrument/Analyst LCS: NT6/LJR

Dilution Factor LCS: 1.00

LCSD: NT6/LJR

LCSD: 1.00

GPC Cleanup: NO

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	390	500	78.0%	396	500	79.2%	1.5%
1,3-Dichlorobenzene	314	500	62.8%	330	500	66.0%	5.0%
1,4-Dichlorobenzene	319	500	63.8%	334	500	66.8%	4.6%
Benzyl Alcohol	721	1000	72.1%	709	1000	70.9%	1.7%
1,2-Dichlorobenzene	327	500	65.4%	339	500	67.8%	3.6%
2-Methylphenol	380	500	76.0%	385	500	77.0%	1.3%
4-Methylphenol	795	1000	79.5%	799	1000	79.9%	0.5%
Hexachloroethane	310	500	62.0%	325	500	65.0%	4.7%
2,4-Dimethylphenol	376	500	75.2%	380	500	76.0%	1.1%
Benzoic Acid	1060	1500	70.7%	1110	1500	74.0%	4.6%
1,2,4-Trichlorobenzene	344	500	68.8%	352	500	70.4%	2.3%
Naphthalene	353	500	70.6%	355	500	71.0%	0.6%
Hexachlorobutadiene	336	500	67.2%	343	500	68.6%	2.1%
2-Methylnaphthalene	369	500	73.8%	373	500	74.6%	1.1%
Dimethylphthalate	417	500	83.4%	409	500	81.8%	1.9%
Acenaphthylene	411	500	82.2%	403	500	80.6%	2.0%
Acenaphthene	385	500	77.0%	379	500	75.8%	1.6%
Dibenzofuran	401	500	80.2%	391	500	78.2%	2.5%
Diethylphthalate	416	500	83.2%	414	500	82.8%	0.5%
Fluorene	401	500	80.2%	393	500	78.6%	2.0%
N-Nitrosodiphenylamine	525	500	105%	528	500	106%	0.6%
Hexachlorobenzene	398	500	79.6%	398	500	79.6%	0.0%
Pentachlorophenol	360	500	72.0%	356	500	71.2%	1.1%
Phenanthrene	395	500	79.0%	395	500	79.0%	0.0%
Anthracene	411	500	82.2%	409	500	81.8%	0.5%
Di-n-Butylphthalate	441	500	88.2%	445	500	89.0%	0.9%
Fluoranthene	425	500	85.0%	429	500	85.8%	0.9%
Pyrene	422	500	84.4%	424	500	84.8%	0.5%
Butylbenzylphthalate	424	500	84.8%	421	500	84.2%	0.7%
Benzo(a)anthracene	393	500	78.6%	393	500	78.6%	0.0%
bis(2-Ethylhexyl)phthalate	433	500	86.6%	436	500	87.2%	0.7%
Chrysene	418	500	83.6%	417	500	83.4%	0.2%
Di-n-Octyl phthalate	410	500	82.0%	414	500	82.8%	1.0%
Benzo(b)fluoranthene	397	500	79.4%	401	500	80.2%	1.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 2 of 2



Sample ID: LCSD-031808

LCS/LCSD

Lab Sample ID: LCS-031808

LIMS ID: 08-5468

Matrix: Sediment

Date Analyzed LCS: 03/20/08 12:26

LCSD: 03/20/08 12:58

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(k)fluoranthene	442	500	88.4%	441	500	88.2%	0.2%
Benzo(a)pyrene	416	500	83.2%	415	500	83.0%	0.2%
Indeno(1,2,3-cd)pyrene	384	500	76.8%	382	500	76.4%	0.5%
Dibenz(a,h)anthracene	407	500	81.4%	401	500	80.2%	1.5%
Benzo(g,h,i)perylene	392	500	78.4%	381	500	76.2%	2.8%
1-Methylnaphthalene	381	500	76.2%	382	500	76.4%	0.3%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	69.6%	69.2%
2-Fluorobiphenyl	77.2%	74.0%
d14-p-Terphenyl	89.6%	87.6%
d4-1,2-Dichlorobenzene	66.4%	66.4%
d5-Phenol	77.3%	76.3%
2-Fluorophenol	74.9%	73.9%
2,4,6-Tribromophenol	87.7%	83.2%
d4-2-Chlorophenol	76.3%	75.5%

Results reported in $\mu\text{g/kg}$

RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN42

Project: PORT OF PORTLAND T6-

Lab File ID: MN42MB

Date Extracted: 03/18/08

Instrument ID: NT6

Date Analyzed: 03/20/08

Matrix: SOLID

Time Analyzed: 1153

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	MN42SB	03/20/08
02	MN42LCSDS1	MN42LCSDS1	MN42SBD	03/20/08
03	T607-C4-Z	MN42D	MN42D	03/20/08
04	T607-C5-Z	MN42E	MN42E	03/20/08
05	T607-C6-Z	MN42F	MN42F	03/20/08
06	T607-MD	MN42G	MN42G	03/20/08
07	T607-MD MS	MN42GMS	MN42GMS	03/20/08
08	T607-MD MSD	MN42GMSD	MN42GMD	03/20/08
09	T601-C1-Z	MN43D	MN43D	03/20/08
10	T601-C2-Z	MN43E	MN43E	03/20/08
11	T601-C3-Z	MN43F	MN43F	03/20/08
12	T601-MD	MN43G	MN43G	03/20/08
13	T501-C12-DPZ	MN44D	MN44D	03/20/08
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: MB-031808
METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 11:53

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.0 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.4	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.9	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.2	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	120	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	9.1	20	< 20 U
91-20-3	Naphthalene	8.7	20	< 20 U
87-68-3	Hexachlorobutadiene	8.1	20	< 20 U
91-57-6	2-Methylnaphthalene	8.2	20	< 20 U
131-11-3	Dimethylphthalate	7.8	20	< 20 U
208-96-8	Acenaphthylene	8.7	20	< 20 U
83-32-9	Acenaphthene	8.2	20	< 20 U
132-64-9	Dibenzofuran	7.6	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	9.0	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.7	20	< 20 U
118-74-1	Hexachlorobenzene	8.0	20	< 20 U
87-86-5	Pentachlorophenol	48	100	< 100 U
85-01-8	Phenanthrene	8.4	20	< 20 U
120-12-7	Anthracene	7.7	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.9	20	< 20 U
129-00-0	Pyrene	7.8	20	< 20 U
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.9	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	< 20 U
218-01-9	Chrysene	6.6	20	< 20 U
117-84-0	Di-n-Octyl phthalate	8.3	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.5	20	< 20 U
207-08-9	Benzo(k)fluoranthene	9.3	20	< 20 U
50-32-8	Benzo(a)pyrene	8.2	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	8.6	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.6	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.8	20	< 20 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: MB-031808
METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5468
Matrix: Sediment
Date Analyzed: 03/20/08 11:53

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.2	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.0%	2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	89.2%	d4-1,2-Dichlorobenzene	66.8%
d5-Phenol	75.7%	2-Fluorophenol	73.9%
2,4,6-Tribromophenol	81.9%	d4-2-Chlorophenol	76.0%

SIM PNA

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1


Sample ID: T601-C1-Z

SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 20:00

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 34.0 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.2	4.8	< 4.8 U
91-57-6	2-Methylnaphthalene	0.87	4.8	< 4.8 U
90-12-0	1-Methylnaphthalene	1.1	4.8	< 4.8 U
208-96-8	Acenaphthylene	1.0	4.8	< 4.8 U
83-32-9	Acenaphthene	1.2	4.8	< 4.8 U
86-73-7	Fluorene	0.63	4.8	< 4.8 U
85-01-8	Phenanthrene	0.99	4.8	7.3
120-12-7	Anthracene	0.94	4.8	< 4.8 U
206-44-0	Fluoranthene	0.26	4.8	14
129-00-0	Pyrene	1.2	4.8	15
56-55-3	Benzo (a) anthracene	0.79	4.8	8.2
218-01-9	Chrysene	1.7	4.8	13
205-99-2	Benzo (b) fluoranthene	1.2	4.8	11
207-08-9	Benzo (k) fluoranthene	0.85	4.8	11
50-32-8	Benzo (a) pyrene	1.4	4.8	9.7
193-39-5	Indeno (1,2,3-cd) pyrene	0.83	4.8	5.3
53-70-3	Dibenz (a,h) anthracene	0.93	4.8	< 4.8 U
191-24-2	Benzo (g,h,i) perylene	1.2	4.8	7.3
132-64-9	Dibenzofuran	0.95	4.8	< 4.8 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 70.3%

d14-Dibenzo (a,h) anthracen 79.0%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: T601-C2-Z

SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 20:25

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 30.4 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.89	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.2	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	< 5.0 U
86-73-7	Fluorene	0.64	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	5.0	17
120-12-7	Anthracene	0.96	5.0	< 5.0 U
206-44-0	Fluoranthene	0.27	5.0	37
129-00-0	Pyrene	1.2	5.0	36
56-55-3	Benzo (a) anthracene	0.80	5.0	17
218-01-9	Chrysene	1.7	5.0	27
205-99-2	Benzo (b) fluoranthene	1.2	5.0	32
207-08-9	Benzo (k) fluoranthene	0.87	5.0	12
50-32-8	Benzo (a) pyrene	1.5	5.0	21
193-39-5	Indeno (1,2,3-cd) pyrene	0.85	5.0	12
53-70-3	Dibenz (a,h) anthracene	0.95	5.0	< 5.0 U
191-24-2	Benzo (g,h,i) perylene	1.2	5.0	14
132-64-9	Dibenzofuran	0.97	5.0	< 5.0 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 67.7%

d14-Dibenzo (a,h) anthracen 75.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: T601-C3-Z

SAMPLE

Lab Sample ID: MN43F

LIMS ID: 08-5470

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 20:50

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 24.2 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	4.9	< 4.9 U
91-57-6	2-Methylnaphthalene	0.88	4.9	< 4.9 U
90-12-0	1-Methylnaphthalene	1.1	4.9	< 4.9 U
208-96-8	Acenaphthylene	1.0	4.9	< 4.9 U
83-32-9	Acenaphthene	1.2	4.9	< 4.9 U
86-73-7	Fluorene	0.64	4.9	< 4.9 U
85-01-8	Phenanthrene	1.0	4.9	< 4.9 U
120-12-7	Anthracene	0.95	4.9	< 4.9 U
206-44-0	Fluoranthene	0.26	4.9	< 4.9 U
129-00-0	Pyrene	1.2	4.9	< 4.9 U
56-55-3	Benzo(a)anthracene	0.79	4.9	< 4.9 U
218-01-9	Chrysene	1.7	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	1.2	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	0.86	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	1.4	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.84	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	0.94	4.9	< 4.9 U
191-24-2	Benzo(g,h,i)perylene	1.2	4.9	< 4.9 U
132-64-9	Dibenzofuran	0.96	4.9	< 4.9 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 68.7%

d14-Dibenzo(a,h)anthracen 86.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1

Sample ID: T601-MD

SAMPLE



Lab Sample ID: MN43G

LIMS ID: 08-5471

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 21:16

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 34.3 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	4.9	< 4.9 U
91-57-6	2-Methylnaphthalene	0.88	4.9	< 4.9 U
90-12-0	1-Methylnaphthalene	1.1	4.9	< 4.9 U
208-96-8	Acenaphthylene	1.0	4.9	< 4.9 U
83-32-9	Acenaphthene	1.2	4.9	< 4.9 U
86-73-7	Fluorene	0.64	4.9	< 4.9 U
85-01-8	Phenanthrene	1.0	4.9	7.4
120-12-7	Anthracene	0.95	4.9	< 4.9 U
206-44-0	Fluoranthene	0.26	4.9	17
129-00-0	Pyrene	1.2	4.9	16
56-55-3	Benzo (a) anthracene	0.79	4.9	8.8
218-01-9	Chrysene	1.7	4.9	13
205-99-2	Benzo (b) fluoranthene	1.2	4.9	16
207-08-9	Benzo (k) fluoranthene	0.86	4.9	4.9
50-32-8	Benzo (a) pyrene	1.4	4.9	9.8
193-39-5	Indeno (1,2,3-cd) pyrene	0.84	4.9	5.9
53-70-3	Dibenz (a,h) anthracene	0.94	4.9	< 4.9 U
191-24-2	Benzo (g,h,i) perylene	1.2	4.9	6.9
132-64-9	Dibenzofuran	0.96	4.9	< 4.9 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 67.3%

d14-Dibenzo (a,h) anthracen 79.0%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

<u>Client ID</u>	<u>MNP</u>	<u>DBA</u>	<u>TOT OUT</u>
MB-031808	80.0%	94.7%	0
LCS-031808	74.3%	93.3%	0
LCSD-031808	78.7%	96.7%	0
T601-C1-Z	70.3%	79.0%	0
T601-C2-Z	67.7%	75.3%	0
T601-C3-Z	68.7%	86.3%	0
T601-MD	67.3%	79.0%	0

	<u>LCS/MB LIMITS</u>	<u>QC LIMITS</u>
(MNP) = d10-2-Methylnaphthalene	(44-100)	(37-106)
(DBA) = d14-Dibenzo(a,h)anthracene	(46-121)	(16-118)

Prep Method: SW3550B
Log Number Range: 08-5468 to 08-5471

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1



Sample ID: LCS-031808

LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Sample Amount LCS: 10.0 g-dry-wt

LCSD: 10.0 g-dry-wt

Date Analyzed LCS: 03/19/08 16:39

Final Extract Volume LCS: 0.50 mL

LCSD: 03/19/08 17:04

LCSD: 0.50 mL

Instrument/Analyst LCS: NT1/VTs

Dilution Factor LCS: 1.00

LCSD: NT1/VTs

LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	104	150	69.3%	112	150	74.7%	7.4%
2-Methylnaphthalene	112	150	74.7%	118	150	78.7%	5.2%
1-Methylnaphthalene	108	150	72.0%	112	150	74.7%	3.6%
Acenaphthylene	115	150	76.7%	120	150	80.0%	4.3%
Acenaphthene	118	150	78.7%	122	150	81.3%	3.3%
Fluorene	125	150	83.3%	134	150	89.3%	6.9%
Phenanthrene	132	150	88.0%	134	150	89.3%	1.5%
Anthracene	134	150	89.3%	142	150	94.7%	5.8%
Fluoranthene	145	150	96.7%	147	150	98.0%	1.4%
Pyrene	140	150	93.3%	144	150	96.0%	2.8%
Benzo(a)anthracene	148	150	98.7%	152	150	101%	2.7%
Chrysene	140	150	93.3%	144	150	96.0%	2.8%
Benzo(b)fluoranthene	148	150	98.7%	145	150	96.7%	2.0%
Benzo(k)fluoranthene	137	150	91.3%	156	150	104%	13.0%
Benzo(a)pyrene	141	150	94.0%	154	150	103%	8.8%
Indeno(1,2,3-cd)pyrene	136	150	90.7%	144	150	96.0%	5.7%
Dibenz(a,h)anthracene	138	150	92.0%	148	150	98.7%	7.0%
Benzo(g,h,i)perylene	128	150	85.3%	133	150	88.7%	3.8%
Dibenzofuran	116	150	77.3%	122	150	81.3%	5.0%

Reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	74.3%	78.7%
d14-Dibenzo(a,h)anthracen	93.3%	96.7%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN44

Project: PORT OF TORTLAND T6-

Lab File ID: MN42MB

Date Extracted: 03/18/08

Instrument ID: NT1

Date Analyzed: 03/19/08

Matrix: SOLID

Time Analyzed: 1614

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	MN42SB	03/19/08
02	MN42LCSDS1	MN42LCSDS1	MN42SBD	03/19/08
03	T607-C4-Z	MN42D	MN42D	03/19/08
04	T607-C4-Z MS	MN42DMS	MN42DMS	03/19/08
05	T607-C4-Z MSD	MN42DMSD	MN42DMSD	03/19/08
06	T607-C5-Z	MN42E	MN42E	03/19/08
07	T607-C6-Z	MN42F	MN42F	03/19/08
08	T607-MD	MN42G	MN42G	03/19/08
09	T601-C1-Z	MN43D	MN43D	03/19/08
10	T601-C2-Z	MN43E	MN43E	03/19/08
11	T601-C3-Z	MN43F	MN43F	03/19/08
12	T601-MD	MN43G	MN43G	03/19/08
13	T501-C12-DPZ	MN44D	MN44D	03/19/08
14				
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30				

COMMENTS:

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 16:14

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.90	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.2	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	< 5.0 U
86-73-7	Fluorene	0.65	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	5.0	< 5.0 U
120-12-7	Anthracene	0.97	5.0	< 5.0 U
206-44-0	Fluoranthene	0.27	5.0	< 5.0 U
129-00-0	Pyrene	1.2	5.0	< 5.0 U
56-55-3	Benzo (a) anthracene	0.81	5.0	< 5.0 U
218-01-9	Chrysene	1.7	5.0	< 5.0 U
205-99-2	Benzo (b) fluoranthene	1.2	5.0	< 5.0 U
207-08-9	Benzo (k) fluoranthene	0.88	5.0	< 5.0 U
50-32-8	Benzo (a) pyrene	1.5	5.0	< 5.0 U
193-39-5	Indeno (1,2,3-cd) pyrene	0.86	5.0	< 5.0 U
53-70-3	Dibenz (a,h) anthracene	0.96	5.0	< 5.0 U
191-24-2	Benzo (g,h,i) perylene	1.2	5.0	< 5.0 U
132-64-9	Dibenzofuran	0.98	5.0	< 5.0 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 80.0%

d14-Dibenzo (a,h) anthracen 94.7%

TBT

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1


Sample ID: T601-C1-Z

SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:54

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.31 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 34.0%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.6	< 3.6 U	
DBT_ION	Dibutyl Tin Ion	3.0	5.4	< 5.4 U	
BT_ION	Butyl Tin Ion	3.8	3.8	< 3.8 U	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripentyl Tin Chloride	65.2%
Tripentyl Tin Chloride	108%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

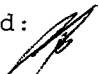
Page 1 of 1

Sample ID: T601-C2-Z
SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 17:14

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.26 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 30.4%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.7	3.3	J
DBT_ION	Dibutyl Tin Ion	3.0	5.5	< 5.5	U
BT_ION	Butyl Tin Ion	3.9	3.9	< 3.9	U

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	68.7%
Triphenyl Tin Chloride	94.4%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T601-C3-Z
SAMPLE

Lab Sample ID: MN43F

LIMS ID: 08-5470

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 17:34

Instrument/Analyst: NT2/VTs

Silica Gel Cleanup: No

Sample Amount: 5.35 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 24.2%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.6	< 3.6	U
DBT_ION	Dibutyl Tin Ion	3.0	5.4	< 5.4	U
BT_ION	Butyl Tin Ion	3.8	3.8	< 3.8	U

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	70.6%
Triphenyl Tin Chloride	106%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS


Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T601-MD
SAMPLE

Lab Sample ID: MN43G

LIMS ID: 08-5471

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 17:54

Instrument/Analyst: NT2/VTs

Silica Gel Cleanup: No

Sample Amount: 5.28 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 34.3%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.7	2.3	J
DBT_ION	Dibutyl Tin Ion	3.0	5.5	< 5.5	U
BT_ION	Butyl Tin Ion	3.9	3.9	< 3.9	U

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	66.9%
Tripentyl Tin Chloride	81.6%

TBT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
Event: 15667/T2

Client ID	TPRT	TPNT	TOT OUT
MB-031808	71.1%	85.3%	0
LCS-031808	72.1%	87.7%	0
LCSD-031808	78.3%	104%	0
T601-C1-Z	65.2%	108%	0
T601-C2-Z	68.7%	94.4%	0
T601-C3-Z	70.6%	106%	0
T601-MD	66.9%	81.6%	0

	LCS/MB LIMITS	QC LIMITS
(TPRT) = Tripropyl Tin Chloride	(37-99)	(25-96)
(TPNT) = Tripentyl Tin Chloride	(47-130)	(30-136)

Prep Method: SW3550B
Analytical Method: TBT (Hexyl) Krone 1988
Log Number Range: 08-5468 to 08-5471

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 


Sample ID: LCS-031808

LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted LCS: 03/18/08

Sample Amount LCS: 5.00 g-dry-wt

LCSD: 5.00 g-dry-wt

Date Analyzed LCS: 03/21/08 14:19

Final Extract Volume LCS: 0.50 mL

LCSD: 03/21/08 14:38

LCSD: 0.50 mL

Instrument/Analyst LCS: NT2/VTs

Dilution Factor LCS: 1.00

LCSD: NT2/VTs

LCSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes

Analyte	LCS	Spike	LCS	LCSD	Spike	LCS	RPD
		Added-LCS	Recovery		Added-LCSD	Recovery	
Tributyl Tin Ion	35.2	44.6	78.9%	44.5	44.6	99.8%	23.3%
Dibutyl Tin Ion	27.7	38.4	72.1%	35.7	38.4	93.0%	25.2%
Butyl Tin Ion	18.0	31.2	57.7%	24.5	31.2	78.5%	30.6%

Reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
Tripentyl Tin Chloride	72.1%	78.3%
Tripentyl Tin Chloride	87.7%	104%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN44

Project: PORT OF PORTLAND T6-

Lab File ID: 032101

Date Extracted: 03/18/08

Instrument ID: NT2

Date Analyzed: 03/21/08

Matrix: SOLID

Time Analyzed: 1359

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	MN42LCSS1	MN42LCSS1	032102	03/21/08
02	MN42LCSDS1	MN42LCSDS1	032103	03/21/08
03	T607-C4-Z	MN42D	032104	03/21/08
04	T607-C4-Z MS	MN42DMS	032105	03/21/08
05	T607-C4-Z MSD	MN42DMSD	032106	03/21/08
06	T607-C5-Z	MN42E	032107	03/21/08
07	T607-C6-Z	MN42F	032108	03/21/08
08	T607-MD	MN42G	032109	03/21/08
09	T601-C1-Z	MN43D	032110	03/21/08
10	T601-C2-Z	MN43E	032111	03/21/08
11	T601-C3-Z	MN43F	032112	03/21/08
12	T601-MD	MN43G	032113	03/21/08
13	T501-C12-DPZ	MN44D	032114	03/21/08
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

Event: 15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 13:59

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.8	3.9	< 3.9 U	
DBT_ION	Dibutyl Tin Ion	3.2	5.8	< 5.8 U	
BT_ION	Butyl Tin Ion	4.1	4.1	< 4.1 U	

Reported in $\mu\text{g/kg}$ (ppb)**TBT Surrogate Recovery**

Tripropyl Tin Chloride	71.1%
Triphenyl Tin Chloride	85.3%


PESTICIDES

Sample ID: T601-C1-Z
SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 15:37

Instrument/Analyst: ECD4/YZ

GPC Cleanup: No

Sulfur Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 34.0%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	1.0	< 1.0 U
76-44-8	Heptachlor	0.40	1.0	< 1.0 U
309-00-2	Aldrin	0.48	1.0	< 1.0 U
60-57-1	Dieldrin	0.84	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	3.7
72-54-8	4,4'-DDD	1.3	2.0	2.7
50-29-3	4,4'-DDT	0.88	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.92	1.0	< 1.0 U
5103-71-9	alpha Chlordane	0.36	1.0	< 1.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.8%
Tetrachlorometaxylene	83.0%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T601-C2-Z
SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 15:57

Instrument/Analyst: ECD4/YZ

GPC Cleanup: No

Sulfur Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 30.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	1.0	< 1.0 U
76-44-8	Heptachlor	0.40	1.0	< 1.0 U
309-00-2	Aldrin	0.48	1.0	< 1.0 U
60-57-1	Dieldrin	0.84	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	2.7
72-54-8	4,4'-DDD	1.3	2.0	2.4
50-29-3	4,4'-DDT	0.88	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.92	1.0	< 1.0 U
5103-71-9	alpha Chlordane	0.36	1.0	< 1.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	72.2%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T601-C3-Z
SAMPLE

Lab Sample ID: MN43F
LIMS ID: 08-5470
Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/21/08

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 16:16
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 24.2%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	1.0	< 1.0 U
76-44-8	Heptachlor	0.40	1.0	< 1.0 U
309-00-2	Aldrin	0.48	1.0	< 1.0 U
60-57-1	Dieldrin	0.84	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	< 2.0 U
72-54-8	4,4'-DDD	1.3	2.0	< 2.0 U
50-29-3	4,4'-DDT	0.88	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.92	1.0	< 1.0 U
5103-71-9	alpha Chlordane	0.37	1.0	< 1.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.0%
Tetrachlorometaxylene	73.0%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T601-MD
SAMPLE

Lab Sample ID: MN43G
LIMS ID: 08-5471
Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/21/08

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 16:36
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 2.00
Silica Gel: Yes
Percent Moisture: 34.3%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.96	2.0	< 2.0 U
76-44-8	Heptachlor	0.79	2.0	< 2.0 U
309-00-2	Aldrin	0.93	2.0	< 2.0 U
60-57-1	Dieldrin	1.6	3.9	< 3.9 U
72-55-9	4,4'-DDE	2.2	3.9	3.3 J
72-54-8	4,4'-DDD	2.5	3.9	4.4 J
50-29-3	4,4'-DDT	1.7	3.9	< 3.9 U
5103-74-2	gamma Chlordane	1.8	2.0	< 2.0 U
5103-71-9	alpha Chlordane	0.71	2.0	< 2.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	75.0%

SW8081 PESTICIDE SOLID SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

Client ID	DCBP	TCMX	TOT OUT
MB-031808	104%	90.5%	0
LCS-031808	91.5%	80.8%	0
LCSD-031808	97.5%	85.0%	0
T601-C1-Z	90.8%	83.0%	0
T601-C2-Z	89.5%	72.2%	0
T601-C3-Z	90.0%	73.0%	0
T601-MD	89.5%	75.0%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(65-125)	(52-143)
(TCMX) = Tetrachlorometaxylene	(53-112)	(43-128)

Prep Method: SW3550B
Log Number Range: 08-5468 to 08-5471

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: LCS-031808
LCS/LCSD

Lab Sample ID: LCS-031808
LIMS ID: 08-5468
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt

Date Analyzed LCS: 03/20/08 13:01
LCSD: 03/20/08 13:20

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD4/YZ
LCSD: ECD4/YZ

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No

Silica Gel: Yes

Sulfur Cleanup: Yes

Florisil Cleanup: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
gamma-BHC (Lindane)	4.36	4.00	109%	4.56	4.00	114%	4.5%
Heptachlor	3.44	4.00	86.0%	3.92	4.00	98.0%	13.0%
Aldrin	4.26	4.00	106%	4.20	4.00	105%	1.4%
Dieldrin	8.34	8.00	104%	8.72	8.00	109%	4.5%
4,4'-DDE	8.70	8.00	109%	9.34	8.00	117%	7.1%
4,4'-DDD	8.12	8.00	102%	8.64	8.00	108%	6.2%
4,4'-DDT	7.80	8.00	97.5%	8.12	8.00	102%	4.0%
gamma Chlordane	4.10	4.00	102%	4.16	4.00	104%	1.5%
alpha Chlordane	4.34	4.00	108%	4.46	4.00	112%	2.7%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	91.5%	97.5%
Tetrachlorometaxylene	80.8%	85.0%

Reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

SAMPLE NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No.: MN42

Project: PORT OF PORTLAND T5

Lab Sample ID: MN42MBS1

Lab File ID: 0320A007

Matrix (soil/water) SOLID

Extraction: (SepF/Cont/Sonc) SW3550B

Sulfur Cleanup (Y/N) Y

Date Extracted: 03/18/08

Date Analyzed (1): 03/20/08

Date Analyzed (2): 03/20/08

Time Analyzed (1): 1241

Time Analyzed (2): 1241

Instrument ID (1): ECD4

Instrument ID (2): ECD4

GC Column (1): STX-CLP1 ID: 0.53(mm) GC Column (2): STX-CLP2 ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	03/20/08	03/20/08
02	MN42LCSDS1	MN42LCSDS1	03/20/08	03/20/08
03	T607-C4-Z	MN42D	03/20/08	03/20/08
04	T607-C5-Z	MN42E	03/20/08	03/20/08
05	T607-C6-Z	MN42F	03/20/08	03/20/08
06	T607-C6-Z MS	MN42FMS	03/20/08	03/20/08
07	T607-C6-Z MS	MN42FMSD	03/20/08	03/20/08
08	T607-MD	MN42G	03/20/08	03/20/08
09	T601-C1-Z	MN43D	03/20/08	03/20/08
10	T601-C2-Z	MN43E	03/20/08	03/20/08
11	T601-C3-Z	MN43F	03/20/08	03/20/08
12	T601-MD	MN43G	03/20/08	03/20/08
13	T501-C12-DPZ	MN44D	03/20/08	03/20/08

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: MB-031808
METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5468
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2
Date Sampled: NA
Date Received: NA

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 12:41
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	1.0	< 1.0 U
76-44-8	Heptachlor	0.40	1.0	< 1.0 U
309-00-2	Aldrin	0.48	1.0	< 1.0 U
60-57-1	Dieldrin	0.84	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.2	2.0	< 2.0 U
72-54-8	4,4'-DDD	1.3	2.0	< 2.0 U
50-29-3	4,4'-DDT	0.88	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.92	1.0	< 1.0 U
5103-71-9	alpha Chlordane	0.37	1.0	< 1.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	90.5%

PCBS

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: T601-C1-Z
SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/26/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:42

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 34.0%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	10	< 10 U
53469-21-9	Aroclor 1242	3.3	10	< 10 U
12672-29-6	Aroclor 1248	3.3	10	< 10 U
11097-69-1	Aroclor 1254	3.3	10	< 10 U
11096-82-5	Aroclor 1260	3.3	10	< 10 U
11104-28-2	Aroclor 1221	3.3	10	< 10 U
11141-16-5	Aroclor 1232	3.3	10	< 10 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	82.2%
Tetrachlorometaxylene	75.2%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T601-C2-Z
SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/26/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:59

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.1 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 30.4%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	10	< 10 U
53469-21-9	Aroclor 1242	3.3	10	< 10 U
12672-29-6	Aroclor 1248	3.3	10	< 10 U
11097-69-1	Aroclor 1254	3.3	10	< 10 U
11096-82-5	Aroclor 1260	3.3	10	< 10 U
11104-28-2	Aroclor 1221	3.3	10	< 10 U
11141-16-5	Aroclor 1232	3.3	10	< 10 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	75.0%
Tetrachlorometaxylene	69.8%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T601-C3-Z

SAMPLE

Lab Sample ID: MN43F

LIMS ID: 08-5470

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/26/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 17:16

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.0 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 24.2%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	10	< 10 U
53469-21-9	Aroclor 1242	3.3	10	< 10 U
12672-29-6	Aroclor 1248	3.3	10	< 10 U
11097-69-1	Aroclor 1254	3.3	10	< 10 U
11096-82-5	Aroclor 1260	3.3	10	< 10 U
11104-28-2	Aroclor 1221	3.3	10	< 10 U
11141-16-5	Aroclor 1232	3.3	10	< 10 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	87.8%
Tetrachlorometaxylene	81.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T601-MD

SAMPLE

Lab Sample ID: MN43G

LIMS ID: 08-5471

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/26/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 17:33

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.6 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 34.3%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.2	9.8	< 9.8 U
53469-21-9	Aroclor 1242	3.2	9.8	< 9.8 U
12672-29-6	Aroclor 1248	3.2	9.8	< 9.8 U
11097-69-1	Aroclor 1254	3.2	9.8	< 9.8 U
11096-82-5	Aroclor 1260	3.2	9.8	< 9.8 U
11104-28-2	Aroclor 1221	3.2	9.8	< 9.8 U
11141-16-5	Aroclor 1232	3.2	9.8	< 9.8 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	70.8%
Tetrachlorometaxylene	66.0%

SW8082/PCB SOLIDS SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN43-Hart Crowser
Project: Port of Portland T6 Berth 601
15667/T2

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-031808	92.5%	36-130	89.8%	30-119	0
LCS-031808	92.5%	36-130	85.2%	30-119	0
LCSD-031808	89.5%	36-130	85.0%	30-119	0
T601-C1-Z	82.2%	33-149	75.2%	32-121	0
T601-C2-Z	75.0%	33-149	69.8%	32-121	0
T601-C3-Z	87.8%	33-149	81.0%	32-121	0
T601-MD	70.8%	33-149	66.0%	32-121	0

Prep Method: SW3550B
Log Number Range: 08-5468 to 08-5471

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED Sample ID: LCS-031808
LCS/LCSD

Lab Sample ID: LCS-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/25/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g-dry-wt

LCSD: 25.0 g-dry-wt

Date Analyzed LCS: 03/21/08 14:24

Final Extract Volume LCS: 2.5 mL

LCSD: 03/21/08 14:42

LCSD: 2.5 mL

Instrument/Analyst LCS: ECD5/PK

Dilution Factor LCS: 1.00

LCSD: ECD5/PK

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Percent Moisture: NA

Acid Cleanup: Yes

Florisil Cleanup: No

Analyte	Spike		LCS		Spike		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	
Aroclor 1016	38.7	50.4	76.8%	38.3	50.4	76.0%	1.0%
Aroclor 1260	43.6	50.4	86.5%	42.4	50.4	84.1%	2.8%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	92.5%	89.5%
Tetrachlorometaxylene	85.2%	85.0%

Results reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No.: MN42

Project: PORT OF PORTLAND T6-

Lab Sample ID: MN42MBS1

Lab File ID: 0321B015

Date Extracted: 03/18/08

Matrix: SOLID

Date Analyzed: 03/21/08

Instrument ID: ECD5

Time Analyzed: 1407

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO. =====	LAB SAMPLE ID =====	DATE ANALYZED =====
01	MN42LCSS1	MN42LCSS1	03/21/08
02	MN42LCSDS1	MN42LCSDS1	03/21/08
03	T607-C4-Z	MN42D	03/21/08
04	T607-C5-Z	MN42E	03/21/08
05	T607-C5-Z MS	MN42EMS	03/21/08
06	T607-C5-Z MSD	MN42EMSD	03/21/08
07	T607-C6-Z	MN42F	03/21/08
08	T607-MD	MN42G	03/21/08
09	T601-C1-Z	MN43D	03/21/08
10	T601-C2-Z	MN43E	03/21/08
11	T601-C3-Z	MN43F	03/21/08
12	T601-MD	MN43G	03/21/08
13	T501-C12-DPZ	MN44D	03/21/08

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1



Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: VTS

Reported: 03/25/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 14:07

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.0 g

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	10	< 10 U
53469-21-9	Aroclor 1242	3.3	10	< 10 U
12672-29-6	Aroclor 1248	3.3	10	< 10 U
11097-69-1	Aroclor 1254	3.3	10	< 10 U
11096-82-5	Aroclor 1260	3.3	10	< 10 U
11104-28-2	Aroclor 1221	3.3	10	< 10 U
11141-16-5	Aroclor 1232	3.3	10	< 10 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	92.5%
Tetrachlorometaxylene	89.8%

METALS

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1


Sample ID: T607-C4-Z

DUPLICATE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	200.8	0.3 U	0.3 U	0.0%	+/- 0.3	L
Arsenic	200.8	3.8	3.5	8.2%	+/- 20%	
Cadmium	6010B	0.9	0.9	0.0%	+/- 0.3	L
Chromium	6010B	18.9	18.3	3.2%	+/- 20%	
Copper	6010B	27.5	25.2	8.7%	+/- 20%	
Lead	6010B	12	12	0.0%	+/- 3	L
Mercury	7471A	0.08	0.09	11.8%	+/- 0.05	L
Nickel	6010B	17	16	6.1%	+/- 20%	
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	135	130	3.8%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1


Sample ID: T607-C4-Z

MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	200.8	0.3 U	1.0	36.9	2.7%	N
Arsenic	200.8	3.8	36.1	36.9	87.5%	
Cadmium	6010B	0.9	66.4	72.7	90.1%	
Chromium	6010B	18.9	81.6	72.7	86.2%	
Copper	6010B	27.5	89.0	72.7	84.6%	
Lead	6010B	12	262	291	85.9%	
Mercury	7471A	0.08	0.62	0.519	104%	
Nickel	6010B	17	77	72.7	82.5%	
Silver	6010B	0.4 U	61.1	72.7	84.0%	
Zinc	6010B	135	200	72.7	89.4%	

Reported in mg/kg-dry

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

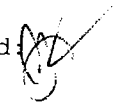
Page 1 of 1

Sample ID: T601-C1-Z
SAMPLE

Lab Sample ID: MN43D

LIMS ID: 08-5468

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 63.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.20	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.30	0.3	3.1	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.030	0.3	0.7	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.42	0.7	18.5	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.060	0.3	25.8	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.30	3	10	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0072	0.07	0.08	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.46	1	16	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.16	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.42	1	105	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1


Sample ID: T601-C2-Z

SAMPLE

Lab Sample ID: MN43E

LIMS ID: 08-5469

Matrix: Sediment

Data Release Authorized 

Reported: 03/28/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 68.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.18	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.27	0.3	3.3	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.029	0.3	0.9	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.40	0.7	17.9	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.057	0.3	21.8	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.29	3	12	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0071	0.07	0.08	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.44	1	16	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.16	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.40	1	126	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

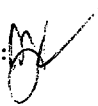
Sample ID: T601-C3-Z

SAMPLE

Lab Sample ID: MN43F

LIMS ID: 08-5470

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601

15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 77.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.17	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.25	0.3	1.5	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.025	0.3	0.3	U
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.35	0.6	15.0	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.051	0.3	10.4	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.25	3	4	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0045	0.05	0.05	U
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.39	1	13	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.14	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.35	1	49	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

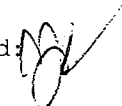
Page 1 of 1

Sample ID: T601-MD
SAMPLE

Lab Sample ID: MN43G

LIMS ID: 08-5471

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN43-Hart Crowser

Project: Port of Portland T6 Berth 601
15667/T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 61.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.20	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.30	0.3	3.1	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.031	0.3	0.8	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.44	0.8	18.7	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.062	0.3	24.7	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.31	3	10	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0061	0.06	0.09	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.48	2	16	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.17	0.5	0.5	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.44	2	115	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: MN42LCS

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	200.8	25.6	25.0	102%	
Arsenic	200.8	27.0	25.0	108%	
Cadmium	6010B	53.0	50.0	106%	
Chromium	6010B	51.8	50.0	104%	
Copper	6010B	52.6	50.0	105%	
Lead	6010B	205	200	102%	
Mercury	7471A	1.04	1.00	104%	
Nickel	6010B	51	50	102%	
Silver	6010B	49.8	50.0	99.6%	
Zinc	6010B	51	50	102%	

Reported in mg/kg-dry

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: MN42MB

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.13	0.2	0.2	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.20	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.020	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.28	0.5	0.5	U
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.040	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.20	2	2	U
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0050	0.05	0.05	U
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.31	1	1	U
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.11	0.3	0.3	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.28	1	1	U

Reported in mg/kg (ppm).


U-Analyte undetected at given RL

RL-Reporting Limit

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
MN43-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T601-C1-Z
ARI ID: 08-5468 MN43D

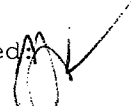
Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	64.40
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	62.60
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	2.92	137
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	14.8	34.1
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.947

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN43-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T601-C2-Z
ARI ID: 08-5469 MN43E

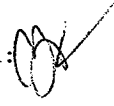
Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	65.10
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	68.30
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	2.99	176
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	12.9	36.6
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.971

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN43-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T601-C3-Z
ARI ID: 08-5470 MN43F

Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	79.90
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	74.50
N-Ammonia	03/19/08 031908#2	EPA 350.1M	mg-N/kg	0.24	12.8
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	1.33	< 1.33 U
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.252

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN43-Hart Crowser



Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T601-MD
ARI ID: 08-5471 MN43G

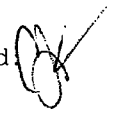
Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	63.00
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	62.60
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	3.10	112
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	15.4	61.7
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	1.04

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

METHOD BLANK RESULTS-CONVENTIONALS
MN43-Hart Crowser



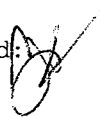
Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	03/18/08	Percent	< 0.01 U
	03/18/08		< 0.01 U
Preserved Total Solids	03/18/08	Percent	< 0.01 U
	03/18/08		< 0.01 U
N-Ammonia	03/19/08	mg-N/kg	< 0.10 U
	03/19/08		< 0.10 U
Sulfide	03/19/08	mg/kg	< 1.00 U
Total Organic Carbon	03/20/08	Percent	< 0.020 U

LAB CONTROL RESULTS-CONVENTIONALS
MN43-Hart Crowser




Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	03/19/08	mg/kg	6.59	6.94	95.0%
Total Organic Carbon	03/20/08	Percent	0.488	0.500	97.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
MN43-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6 Berth 60
Event: 15667/T2
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	03/19/08	mg-N/kg	101	100	101.0%
SPEX 28-24AS	03/19/08		100	100	100.0%
Total Organic Carbon	03/20/08	Percent	3.03	3.35	90.4%
NIST #8704					

GRAINSIZE

Hart Crowser
Port of Portland T6 Berth 601 15667/T2

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
6A-T	100.0	99.6	98.1	96.7	95.7	94.4	92.2	82.3	61.7	41.3	27.3	18.8	12.5	7.9
6A-T	100.0	99.9	98.8	97.7	96.8	95.9	94.0	83.2	62.9	42.4	28.2	19.2	12.8	8.0
6A-T	100.0	100.0	99.2	98.3	97.5	96.4	94.5	84.7	65.0	44.2	29.8	20.2	13.5	8.5
T601-C1-Z	100.0	100.0	99.8	99.6	99.4	99.0	96.4	72.6	40.3	23.9	13.6	8.3	5.5	3.4
T601-C2-Z	100.0	100.0	99.8	99.3	98.0	91.2	76.3	53.0	32.0	18.7	11.4	7.1	4.6	2.7
T601-C3-Z	100.0	100.0	100.0	99.8	97.4	86.1	27.0	12.0	6.4	3.9	2.3	1.6	1.1	0.6
T601-MD	100.0	100.0	99.8	99.5	99.1	94.9	80.4	59.5	38.3	22.3	13.0	8.3	5.6	3.4

Notes to the Testing:

- Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

Hart Crowser
Port of Portland T6 Berth 601 15667/T2

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10	<4
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
6A-T	1.9	1.4	1.0	1.2	2.2	9.9	20.7	20.4	13.9	8.6	6.3	4.7	7.9	82.3
6A-T	1.2	1.1	0.9	1.0	1.9	10.8	20.3	20.5	14.2	9.0	6.3	4.9	8.0	83.2
6A-T	0.8	0.9	0.8	1.1	1.9	9.8	19.7	20.8	14.4	9.6	6.7	5.0	8.5	84.7
T601-C1-Z	0.2	0.2	0.2	0.4	2.6	23.8	32.3	16.4	10.3	5.3	2.8	2.1	3.4	72.6
T601-C2-Z	0.2	0.5	1.3	6.8	14.9	23.3	21.0	13.3	7.3	4.3	2.5	1.9	2.7	53.0
T601-C3-Z	0.0	0.2	2.4	11.3	59.1	15.0	5.5	2.6	1.6	0.7	0.5	0.4	0.6	12.0
T601-MD	0.2	0.3	0.5	4.2	14.5	20.9	21.2	16.0	9.2	4.7	2.8	2.1	3.4	59.5

Notes to the Testing:

- Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

QA SUMMARY

PROJECT:	Hart Crowser	Project No.:	Port of Portland T6 Berth 601 15667/T2
ARI Triplicate Sample ID:	MM88 C	Batch No.:	MN43 -1
Client Triplicate Sample ID:	6A-T	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
6A-T	100.0	99.6	98.1	96.7	95.7	94.4	92.2	82.3	61.7	41.3	27.3	18.8	12.5	7.9
6A-T	100.0	99.9	98.8	97.7	96.8	95.9	94.0	83.2	62.9	42.4	28.2	19.2	12.8	8.0
6A-T	100.0	100.0	99.2	98.3	97.5	96.4	94.5	84.7	65.0	44.2	29.8	20.2	13.5	8.5
AVE	NA	99.85	98.69	97.58	96.67	95.56	93.56	83.42	63.20	42.64	28.45	19.40	12.95	8.10
STDEV	NA	0.21	0.58	0.81	0.92	1.02	1.19	1.21	1.71	1.49	1.26	0.75	0.49	0.31
%RSD	NA	0.21	0.59	0.83	0.96	1.06	1.27	1.45	2.71	3.49	4.44	3.87	3.78	3.88

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
6A-T	3/12/2008	3/18/2008	3/22/2008	97.6		19.6
6A-T	3/12/2008	3/18/2008	3/22/2008	99.1		19.6
6A-T	3/12/2008	3/18/2008	3/22/2008	102.1		20.2
T601-C1-Z	3/12/2008	3/18/2008	3/22/2008	99.7		20.4
T601-C2-Z	3/12/2008	3/18/2008	3/22/2008	102.2		18.3
T601-C3-Z	3/12/2008	3/18/2008	3/22/2008	101.1		12.1
T601-MD	3/12/2008	3/18/2008	3/22/2008	100.4		19.5

* ARI Internal QA limits = 95-105%

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Warren P. Woodard
Created: 3/17/08

Worklist: 7724
Analyst: MS
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	MN43D 08-5468 T601-C1-Z	1.10	12.40	8.56	66.0	NR
2.	MN43E 08-5469 T601-C2-Z	1.10	12.34	8.92	69.6	NR
3.	MN43F 08-5470 T601-C3-Z	1.10	14.10	10.96	75.8	NR
4.	MN43G 08-5471 T601-MD	1.12	12.74	8.76	65.7	NR

Solids Data Entry Report
Date: 03/19/08

Checked by: HA
Data Analyst: DM

Date: 3/20/08

Solids Determination performed on 03/18/08 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
MN43	D	T601-C1-Z	1.013	10.625	7.077	63.09
MN43	E	T601-C2-Z	1.020	10.471	7.486	68.42
MN43	F	T601-C3-Z	1.015	10.793	8.620	77.78
MN43	G	T601-MD	1.050	10.568	6.891	61.37



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 28, 2008

Mr. Rick Ernst
Hart Crowser, Inc.
5 Centerpointe Dr #240
Lake Oswego, OR 97035

RE: Project: T6- Berth 607, 156671 T2
ARI Job No: MN42

Dear Mr. Ernst:

Please find enclosed the original chain of custody documentation and the analytical results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted seven sediment samples on March 14, 2008. The samples were received in good condition at 5.8°C. There were no discrepancies between the sample containers' labels and the COC. Three samples have been placed on hold pending further instructions.

The samples were analyzed for PSDDA PCBs, TBT, Pesticides, SIM PNAs, PSDDA SVOA, TOC, TS, Sulfide, Ammonia, Grainsize and Total Metals, as requested on the COC.

Please reference the Case Narrative for analytical details associated with this project.

An electronic copy of these reports and the supporting data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Respectfully,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

Enclosures

cc: files MN42

**Chain of Custody
Documentation**

**prepared
for**

HART CROWSER, INC.


Project: Port of Portland T6-Berth 607, 15667-T2

ARI JOB NO: MN42

**prepared
by**

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <i>MIN 42</i>		Turn-around Requested: <i>Standard</i>		Page: <i>1</i> of <i>1</i>		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax)						
ARI Client Company: <i>Hart Crowser</i>		Phone: <i>503-620-7284</i>		Date: <i>3/12/08</i>	Ice Present? <i>Yes Partially melted by 3/14/08</i>							
Client Contact: <i>Rich Ernst</i>				No. of Coolers: <i>1</i>	Cooler Temps: <i>5.8</i>							
Client Project Name: <i>Port of Portland T6 - Box 1607</i>				Analysis Requested				Notes/Comments				
Client Project #: <i>15667-T2</i>		Samplers: <i>LISA GLOVER</i>		Archive <i>Freeze</i>	Grain-Size	SET-10 Metals <i>6020/7471</i>	TOC/TS/NH ₃ <i>641 (Silica)</i>		TBT	PAHs <i>8270-SF/M</i>	SVOCs <i>8270</i>	PCBs/Pest <i>9281 A/B/C/D</i>
Sample ID	Date	Time	Matrix	No. Containers								
T607-C4-MD	3/12/08	1530	S	2	X							
T607-C5-MD	3/12/08	1610	S	2	X							
T607-C6-MD	3/12/08	1700	S	2	X							
T607-C4-Z	3/12/08	1530	S	5		X	X	X	X	X	X	Archive left over sediment
T607-C5-Z	3/12/08	1610	S	5		X	X	X	X	X	X	
T607-C6-Z	3/12/08	1700	S	5		X	X	X	X	X	X	
T607-MD	3/12/08	1715	S	5		X	X	X	X	X	X	
Comments/Special Instructions					Relinquished by: (Signature) <i>Lisa Glover</i> Printed Name: <i>LISA GLOVER</i> Company: <i>Hart Crowser</i> Date & Time: <i>3/12/08 1600</i>		Received by: (Signature) <i>E Joshi</i> Printed Name: <i>E Joshi</i> Company: <i>ARI</i> Date & Time: <i>3/14/08 0920</i>		Relinquished by: (Signature) Printed Name: Company: Date & Time:		Received by: (Signature) Printed Name: Company: Date & Time:	

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Hart Crowser

COC No: _____

Assigned ARI Job No: _____

Project Name: Port of Portland T6-Berth 607

Delivered by: UPS

Tracking No: _____

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 5.8 °C

Cooler Accepted by: sgoshi Date: 3/14/08 Time: 0920

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? BW
Was sufficient ice used (if appropriate)? YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottle arrive in good condition (unbroken)? YES* NO
Were all bottle labels complete and legible? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist) YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO

Samples Logged by: sgoshi Date: 3/17/08 Time: 0640

**** Notify Project Manager of discrepancies or concerns ****

Explain discrepancies or negative responses:

Sample T607-C6-md - both lids cracked; replaced at sample receiving.
Sample T607-C6-z 1160z jar lid cracked; " "
Sample T607-md " " "

By: _____

Date: _____

Case Narrative

**prepared
for**

HART CROWSER, INC.

Project: Port of Portland T6-Berth 607, 15667-T2

ARI JOB NO: MN42

**prepared
by**

Analytical Resources, Inc.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN42
March 28, 2008

Semivolatile Analysis (PSDDA 8270D):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/20/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated Semivolatile organics list.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries are in control.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Semivolatile SIM Analysis (8270D):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/19/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated SIM Semivolatile organics list.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries and RPDs were in control.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN42
March 28, 2008
Page 2

Tributyl Tin Analysis (GC/MS Krone):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated Tributyl Tins analysis.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries were in control.

The matrix spike is out of control low for Dibutyl Tin and Butyl Tin with wide RPDs for both Ions for sample T607-C4-Z. The matrix spike recoveries are in control.

PCB and Pesticides Analysis (PSDDA):

The samples were extracted on 3/18/08 and the extracts were analyzed on 3/20/08 and 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): All method blanks were free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the analyses.

LCS/LCSD (s): All percent recoveries and RPDs were in control.



Case Narrative
Hart Crowser
Port Of Portland
ARI Job: MN42
March 28, 2008
Page 3

Total Metals Analysis:

The samples were digested on 3/18/08 and the samples were analyzed between 3/20/08 and 3/21/08 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria.

Method Blank (s): The method blank was free of contamination

Samples: There were no anomalies associated with this analysis.

LCS/LCSD (s): All percent recoveries were in control.

The Matrix Spike is out of control low for Antimony for the total metals analysis on sample **T607-C4-Z**. All other spike recoveries are in control; therefore no further corrective action was taken.

General Chemistry Analyses

All General chemistry samples were analyzed within the method recommended holding time for the analyses.

Samples: No anomalies were encountered for these samples.

Method Blank(s): All method blanks were free of element contamination.

LCS/SRM/Replicate: All percent recoveries and RPDs were in control.



Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- NR Spiked compound recovery is not reported due to chromatographic interference
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for



- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



Client: Hart Crowser

Project No.: MN42

Client Project: Port of Portland T6-Berth 607 15667-T2

Case Narrative

1. Four samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch and one sample in the batch was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The data is provided in summary tables and plots.
4. There were no other noted anomalies in this project.

Approved by:

Taylor McKenzie
Title: Lead Technician

Date:

3-24-08

Data Summary Package

**prepared
for**

HART CROWSER, INC.

Project: Port of Portland T6-Berth 607, 15667-T2

ARI JOB NO: MN42

**prepared
by**

Analytical Resources, Inc.

SEMIVOLATILE ORGANICS

Sample ID: T607-C4-Z
 SAMPLE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 15:09

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 33.1%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	30
541-73-1	1,3-Dichlorobenzene	7.3	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.2	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.7	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.1	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	360
120-82-1	1,2,4-Trichlorobenzene	8.9	20	< 20 U
91-20-3	Naphthalene	8.5	20	< 20 U
87-68-3	Hexachlorobutadiene	8.0	20	< 20 U
91-57-6	2-Methylnaphthalene	8.1	20	< 20 U
131-11-3	Dimethylphthalate	7.6	20	< 20 U
208-96-8	Acenaphthylene	8.5	20	< 20 U
83-32-9	Acenaphthene	8.1	20	32
132-64-9	Dibenzofuran	7.4	20	< 20 U
84-66-2	Diethylphthalate	16	20	76
86-73-7	Fluorene	8.8	20	18 J
86-30-6	N-Nitrosodiphenylamine	8.5	20	< 20 U
118-74-1	Hexachlorobenzene	7.9	20	< 20 U
87-86-5	Pentachlorophenol	47	98	< 98 U
85-01-8	Phenanthrene	8.2	20	66
120-12-7	Anthracene	7.6	20	17 J
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.8	20	96
129-00-0	Pyrene	7.6	20	78
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.8	20	45
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	23
218-01-9	Chrysene	6.5	20	77
117-84-0	Di-n-Octyl phthalate	8.2	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.3	20	40
207-08-9	Benzo(k)fluoranthene	9.1	20	54
50-32-8	Benzo(a)pyrene	8.0	20	36
193-39-5	Indeno(1,2,3-cd)pyrene	8.4	20	28
53-70-3	Dibenz(a,h)anthracene	8.4	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.6	20	23

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 2 of 2

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: T607-C4-Z

SAMPLE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Date Analyzed: 03/20/08 15:09

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.1	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)Semivolatile Surrogate Recovery

d5-Nitrobenzene	61.6%	2-Fluorobiphenyl	65.6%
d14-p-Terphenyl	75.2%	d4-1,2-Dichlorobenzene	57.2%
d5-Phenol	64.5%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	74.9%	d4-2-Chlorophenol	64.5%

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 15:41

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.3	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.8	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.1	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	280
120-82-1	1,2,4-Trichlorobenzene	9.0	20	< 20 U
91-20-3	Naphthalene	8.6	20	< 20 U
87-68-3	Hexachlorobutadiene	8.0	20	< 20 U
91-57-6	2-Methylnaphthalene	8.1	20	< 20 U
131-11-3	Dimethylphthalate	7.7	20	< 20 U
208-96-8	Acenaphthylene	8.6	20	< 20 U
83-32-9	Acenaphthene	8.1	20	32
132-64-9	Dibenzofuran	7.5	20	16 J
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.9	20	34
86-30-6	N-Nitrosodiphenylamine	8.6	20	< 20 U
118-74-1	Hexachlorobenzene	7.9	20	< 20 U
87-86-5	Pentachlorophenol	47	99	< 99 U
85-01-8	Phenanthrene	8.3	20	330
120-12-7	Anthracene	7.7	20	41
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.8	20	490
129-00-0	Pyrene	7.7	20	360
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.9	20	120
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	32
218-01-9	Chrysene	6.6	20	120
117-84-0	Di-n-Octyl phthalate	8.2	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.4	20	89
207-08-9	Benzo(k)fluoranthene	9.2	20	97
50-32-8	Benzo(a)pyrene	8.1	20	81
193-39-5	Indeno(1,2,3-cd)pyrene	8.5	20	46
53-70-3	Dibenz(a,h)anthracene	8.5	20	13 J
191-24-2	Benzo(g,h,i)perylene	6.7	20	36

Lab Sample ID: MN42E
LIMS ID: 08-5462
Matrix: Sediment
Date Analyzed: 03/20/08 15:41

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.1	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	62.4%	2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	81.6%	d4-1,2-Dichlorobenzene	54.8%
d5-Phenol	66.4%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	82.7%	d4-2-Chlorophenol	66.4%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: T607-C6-Z
SAMPLE



Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 16:14

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.3	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.2	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.7	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.1	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	110	200	140 J
120-82-1	1,2,4-Trichlorobenzene	8.9	20	< 20 U
91-20-3	Naphthalene	8.5	20	< 20 U
87-68-3	Hexachlorobutadiene	8.0	20	< 20 U
91-57-6	2-Methylnaphthalene	8.1	20	< 20 U
131-11-3	Dimethylphthalate	7.6	20	< 20 U
208-96-8	Acenaphthylene	8.5	20	< 20 U
83-32-9	Acenaphthene	8.1	20	30
132-64-9	Dibenzofuran	7.4	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.8	20	11 J
86-30-6	N-Nitrosodiphenylamine	8.5	20	< 20 U
118-74-1	Hexachlorobenzene	7.9	20	< 20 U
87-86-5	Pentachlorophenol	47	98	< 98 U
85-01-8	Phenanthrene	8.3	20	61
120-12-7	Anthracene	7.6	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.8	20	51
129-00-0	Pyrene	7.6	20	44
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.8	20	15 J
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	12 J
218-01-9	Chrysene	6.5	20	19 J
117-84-0	Di-n-Octyl phthalate	8.2	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.4	20	< 20 U
207-08-9	Benzo(k)fluoranthene	9.1	20	14 J
50-32-8	Benzo(a)pyrene	8.0	20	11 J
193-39-5	Indeno(1,2,3-cd)pyrene	8.5	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.4	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.6	20	< 20 U

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

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Sample ID: T607-C6-Z

SAMPLE

ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Date Analyzed: 03/20/08 16:14

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.1	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.4%	2-Fluorobiphenyl	72.8%
d14-p-Terphenyl	82.0%	d4-1,2-Dichlorobenzene	62.0%
d5-Phenol	68.0%	2-Fluorophenol	69.3%
2,4,6-Tribromophenol	82.4%	d4-2-Chlorophenol	70.4%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: T607-MD

SAMPLE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 16:46

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.3	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.2	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.7	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.0	20	< 20 U
105-67-9	2,4-Dimethylphenol	14	20	< 20 U
65-85-0	Benzoic Acid	110	200	230
120-82-1	1,2,4-Trichlorobenzene	8.9	20	< 20 U
91-20-3	Naphthalene	8.5	20	< 20 U
87-68-3	Hexachlorobutadiene	7.9	20	< 20 U
91-57-6	2-Methylnaphthalene	8.0	20	< 20 U
131-11-3	Dimethylphthalate	7.6	20	< 20 U
208-96-8	Acenaphthylene	8.5	20	< 20 U
83-32-9	Acenaphthene	8.0	20	100
132-64-9	Dibenzofuran	7.4	20	37
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	8.8	20	95
86-30-6	N-Nitrosodiphenylamine	8.5	20	< 20 U
118-74-1	Hexachlorobenzene	7.9	20	< 20 U
87-86-5	Pentachlorophenol	47	98	< 98 U
85-01-8	Phenanthrene	8.2	20	270
120-12-7	Anthracene	7.6	20	50
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.8	20	210
129-00-0	Pyrene	7.6	20	140
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.8	20	72
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	76
218-01-9	Chrysene	6.5	20	120
117-84-0	Di-n-Octyl phthalate	8.2	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.3	20	51
207-08-9	Benzo(k)fluoranthene	9.1	20	85
50-32-8	Benzo(a)pyrene	8.0	20	60
193-39-5	Indeno(1,2,3-cd)pyrene	8.4	20	27
53-70-3	Dibenz(a,h)anthracene	8.4	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.6	20	22

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: T607-MD
SAMPLE

Lab Sample ID: MN42G
LIMS ID: 08-5464
Matrix: Sediment
Date Analyzed: 03/20/08 16:46

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.0	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.0%	2-Fluorobiphenyl	81.6%
d14-p-Terphenyl	91.2%	d4-1,2-Dichlorobenzene	65.6%
d5-Phenol	77.9%	2-Fluorophenol	78.1%
2,4,6-Tribromophenol	93.6%	d4-2-Chlorophenol	78.7%

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
T607-C4-Z	61.6%	65.6%	75.2%	57.2%	64.5%	64.0%	74.9%	64.5%		0
T607-C5-Z	62.4%	71.6%	81.6%	54.8%	66.4%	64.0%	82.7%	66.4%		0
T607-C6-Z	66.4%	72.8%	82.0%	62.0%	68.0%	69.3%	82.4%	70.4%		0
MB-031808	68.0%	72.0%	89.2%	66.8%	75.7%	73.9%	81.9%	76.0%		0
LCS-031808	69.6%	77.2%	89.6%	66.4%	77.3%	74.9%	87.7%	76.3%		0
LCSD-031808	69.2%	74.0%	87.6%	66.4%	76.3%	73.9%	83.2%	75.5%		0
T607-MD	72.0%	81.6%	91.2%	65.6%	77.9%	78.1%	93.6%	78.7%		0
T607-MD MS	65.2%	71.6%	79.2%	56.0%	69.9%	69.1%	80.3%	69.9%		0
T607-MD MSD	66.4%	72.8%	81.6%	62.8%	71.2%	71.7%	81.6%	71.7%		0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 08-5461 to 08-5464

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

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Sample ID: T607-MD

MS/MSD

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted MS/MSD: 03/18/08

Sample Amount MS: 25.5 g-dry-wt

MSD: 25.5 g-dry-wt

Date Analyzed MS: 03/20/08 17:18

Final Extract Volume MS: 0.5 mL

MSD: 03/20/08 17:50

MSD: 0.5 mL

Instrument/Analyst MS: NT6/LJR

Dilution Factor MS: 1.00

MSD: NT6/LJR

MSD: 1.00

GPC Cleanup: NO

Percent Moisture: 32.8 %

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	< 19.6	364	489	74.4%	336	489	68.7%	8.0%
1,3-Dichlorobenzene	< 19.6	305	489	62.4%	286	489	58.5%	6.4%
1,4-Dichlorobenzene	< 19.6	307	489	62.8%	290	489	59.3%	5.7%
Benzyl Alcohol	< 19.6	635	979	64.9%	655	979	66.9%	3.1%
1,2-Dichlorobenzene	< 19.6	316	489	64.6%	300	489	61.3%	5.2%
2-Methylphenol	< 19.6	365	489	74.6%	336	489	68.7%	8.3%
4-Methylphenol	< 19.6	752	979	76.8%	697	979	71.2%	7.6%
Hexachloroethane	< 19.6	265	489	54.2%	219	489	44.8%	19.0%
2,4-Dimethylphenol	< 19.6	366	489	74.8%	336	489	68.7%	8.5%
Benzoic Acid	226	1190	1470	65.6%	1190	1470	65.6%	0.0%
1,2,4-Trichlorobenzene	< 19.6	344	489	70.3%	319	489	65.2%	7.5%
Naphthalene	< 19.6	347	489	71.0%	322	489	65.8%	7.5%
Hexachlorobutadiene	< 19.6	333	489	68.1%	312	489	63.8%	6.5%
2-Methylnaphthalene	< 19.6	360	489	73.6%	335	489	68.5%	7.2%
Dimethylphthalate	< 19.6	395	489	80.8%	365	489	74.6%	7.9%
Acenaphthylene	< 19.6	398	489	81.4%	367	489	75.1%	8.1%
Acenaphthene	104	467	489	74.2%	432	489	67.1%	7.8%
Dibenzofuran	37.4	416	489	77.4%	382	489	70.5%	8.5%
Diethylphthalate	< 19.6	396	489	81.0%	361	489	73.8%	9.2%
Fluorene	94.8	467	489	76.1%	432	489	69.0%	7.8%
N-Nitrosodiphenylamine	< 19.6	456	489	93.3%	445	489	91.0%	2.4%
Hexachlorobenzene	< 19.6	384	489	78.5%	349	489	71.4%	9.5%
Pentachlorophenol	< 97.9	401	489	82.0%	352	489	72.0%	13.0%
Phenanthrene	270	606	489	68.7%	574	489	62.2%	5.4%
Anthracene	49.7	421	489	75.9%	403	489	72.2%	4.4%
Di-n-Butylphthalate	< 19.6	409	489	83.6%	371	489	75.9%	9.7%
Fluoranthene	206	604	489	81.4%	560	489	72.4%	7.6%
Pyrene	145	533	489	79.3%	501	489	72.8%	6.2%
Butylbenzylphthalate	< 19.6	387	489	79.1%	361	489	73.8%	7.0%
Benzo(a)anthracene	71.8	412	489	69.6%	391	489	65.3%	5.2%
bis(2-Ethylhexyl)phthalate	76.0	455	489	77.5%	405	489	67.3%	11.6%
Chrysene	120	438	489	65.0%	503	489	78.3%	13.8%
Di-n-Octyl phthalate	< 19.6	391	489	80.0%	358	489	73.2%	8.8%
Benzo(b)fluoranthene	51.1	404	489	72.2%	423	489	76.1%	4.6%
Benzo(k)fluoranthene	84.8	487	489	82.2%	431	489	70.8%	12.2%
Benzo(a)pyrene	59.7	418	489	73.3%	394	489	68.4%	5.9%
Indeno(1,2,3-cd)pyrene	27.2	275	489	50.7%	250	489	45.6%	9.5%
Dibenz(a,h)anthracene	< 19.6	288	489	58.9%	250	489	51.1%	14.1%
Benzo(g,h,i)perylene	21.5	233	489	43.3%	204	489	37.3%	13.3%
1-Methylnaphthalene	< 19.6	381	489	77.9%	350	489	71.6%	8.5%

Results reported in µg/kg

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2



Sample ID: T607-MD

MATRIX SPIKE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 17:18

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	---
541-73-1	1,3-Dichlorobenzene	7.3	20	---
106-46-7	1,4-Dichlorobenzene	7.2	20	---
100-51-6	Benzyl Alcohol	14	20	---
95-50-1	1,2-Dichlorobenzene	7.7	20	---
95-48-7	2-Methylphenol	14	20	---
106-44-5	4-Methylphenol	13	20	---
67-72-1	Hexachloroethane	7.0	20	---
105-67-9	2,4-Dimethylphenol	14	20	---
65-85-0	Benzoic Acid	110	200	---
120-82-1	1,2,4-Trichlorobenzene	8.9	20	---
91-20-3	Naphthalene	8.5	20	---
87-68-3	Hexachlorobutadiene	7.9	20	---
91-57-6	2-Methylnaphthalene	8.0	20	---
131-11-3	Dimethylphthalate	7.6	20	---
208-96-8	Acenaphthylene	8.5	20	---
83-32-9	Acenaphthene	8.0	20	---
132-64-9	Dibenzofuran	7.4	20	---
84-66-2	Diethylphthalate	16	20	---
86-73-7	Fluorene	8.8	20	---
86-30-6	N-Nitrosodiphenylamine	8.5	20	---
118-74-1	Hexachlorobenzene	7.9	20	---
87-86-5	Pentachlorophenol	47	98	---
85-01-8	Phenanthrene	8.2	20	---
120-12-7	Anthracene	7.6	20	---
84-74-2	Di-n-Butylphthalate	12	20	---
206-44-0	Fluoranthene	7.8	20	---
129-00-0	Pyrene	7.6	20	---
85-68-7	Butylbenzylphthalate	11	20	---
56-55-3	Benzo(a)anthracene	5.8	20	---
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	---
218-01-9	Chrysene	6.5	20	---
117-84-0	Di-n-Octyl phthalate	8.2	20	---
205-99-2	Benzo(b)fluoranthene	9.3	20	---
207-08-9	Benzo(k)fluoranthene	9.1	20	---
50-32-8	Benzo(a)pyrene	8.0	20	---
193-39-5	Indeno(1,2,3-cd)pyrene	8.4	20	---
53-70-3	Dibenz(a,h)anthracene	8.4	20	---
191-24-2	Benzo(g,h,i)perylene	6.6	20	---

Sample ID: T607-MD
MATRIX SPIKE

Lab Sample ID: MN42G
LIMS ID: 08-5464
Matrix: Sediment
Date Analyzed: 03/20/08 17:18

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.0	20	---

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	65.2%	2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	79.2%	d4-1,2-Dichlorobenzene	56.0%
d5-Phenol	69.9%	2-Fluorophenol	69.1%
2,4,6-Tribromophenol	80.3%	d4-2-Chlorophenol	69.9%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2



Sample ID: T607-MD

MATRIX SPIKE DUPLICATE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 17:50

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	13	20	---
541-73-1	1,3-Dichlorobenzene	7.3	20	---
106-46-7	1,4-Dichlorobenzene	7.2	20	---
100-51-6	Benzyl Alcohol	14	20	---
95-50-1	1,2-Dichlorobenzene	7.7	20	---
95-48-7	2-Methylphenol	14	20	---
106-44-5	4-Methylphenol	13	20	---
67-72-1	Hexachloroethane	7.0	20	---
105-67-9	2,4-Dimethylphenol	14	20	---
65-85-0	Benzoic Acid	110	200	---
120-82-1	1,2,4-Trichlorobenzene	8.9	20	---
91-20-3	Naphthalene	8.5	20	---
87-68-3	Hexachlorobutadiene	7.9	20	---
91-57-6	2-Methylnaphthalene	8.0	20	---
131-11-3	Dimethylphthalate	7.6	20	---
208-96-8	Acenaphthylene	8.5	20	---
83-32-9	Acenaphthene	8.0	20	---
132-64-9	Dibenzofuran	7.4	20	---
84-66-2	Diethylphthalate	16	20	---
86-73-7	Fluorene	8.8	20	---
86-30-6	N-Nitrosodiphenylamine	8.5	20	---
118-74-1	Hexachlorobenzene	7.9	20	---
87-86-5	Pentachlorophenol	47	98	---
85-01-8	Phenanthrene	8.2	20	---
120-12-7	Anthracene	7.6	20	---
84-74-2	Di-n-Butylphthalate	12	20	---
206-44-0	Fluoranthene	7.8	20	---
129-00-0	Pyrene	7.6	20	---
85-68-7	Butylbenzylphthalate	11	20	---
56-55-3	Benzo(a)anthracene	5.8	20	---
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	---
218-01-9	Chrysene	6.5	20	---
117-84-0	Di-n-Octyl phthalate	8.2	20	---
205-99-2	Benzo(b)fluoranthene	9.3	20	---
207-08-9	Benzo(k)fluoranthene	9.1	20	---
50-32-8	Benzo(a)pyrene	8.0	20	---
193-39-5	Indeno(1,2,3-cd)pyrene	8.4	20	---
53-70-3	Dibenz(a,h)anthracene	8.4	20	---
191-24-2	Benzo(g,h,i)perylene	6.6	20	---



ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: T607-MD
MATRIX SPIKE DUPLICATE

Lab Sample ID: MN42G
LIMS ID: 08-5464
Matrix: Sediment
Date Analyzed: 03/20/08 17:50

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.0	20	---

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.4%	2-Fluorobiphenyl	72.8%
d14-p-Terphenyl	81.6%	d4-1,2-Dichlorobenzene	62.8%
d5-Phenol	71.2%	2-Fluorophenol	71.7%
2,4,6-Tribromophenol	81.6%	d4-2-Chlorophenol	71.7%

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 2



Sample ID: LCS-031808
 LCS/LCSD

Lab Sample ID: LCS-031808
 LIMS ID: 08-5464
 Matrix: Sediment
 Data Release Authorized:
 Reported: 03/21/08

QC Report No: MN42-Hart Crowser
 Project: Port of Portland T6-Berth 607
 15667-T2
 Date Sampled: 03/12/08
 Date Received: 03/14/08

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g

Date Analyzed LCS: 03/20/08 12:26

LCSD: 25.0 g

LCSD: 03/20/08 12:58

Final Extract Volume LCS: 0.5 mL

Instrument/Analyst LCS: NT6/LJR

LCSD: 0.5 mL

LCSD: NT6/LJR

Dilution Factor LCS: 1.00

LCSD: 1.00

GPC Cleanup: NO

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	390	500	78.0%	396	500	79.2%	1.5%
1,3-Dichlorobenzene	314	500	62.8%	330	500	66.0%	5.0%
1,4-Dichlorobenzene	319	500	63.8%	334	500	66.8%	4.6%
Benzyl Alcohol	721	1000	72.1%	709	1000	70.9%	1.7%
1,2-Dichlorobenzene	327	500	65.4%	339	500	67.8%	3.6%
2-Methylphenol	380	500	76.0%	385	500	77.0%	1.3%
4-Methylphenol	795	1000	79.5%	799	1000	79.9%	0.5%
Hexachloroethane	310	500	62.0%	325	500	65.0%	4.7%
2,4-Dimethylphenol	376	500	75.2%	380	500	76.0%	1.1%
Benzoic Acid	1060	1500	70.7%	1110	1500	74.0%	4.6%
1,2,4-Trichlorobenzene	344	500	68.8%	352	500	70.4%	2.3%
Naphthalene	353	500	70.6%	355	500	71.0%	0.6%
Hexachlorobutadiene	336	500	67.2%	343	500	68.6%	2.1%
2-Methylnaphthalene	369	500	73.8%	373	500	74.6%	1.1%
Dimethylphthalate	417	500	83.4%	409	500	81.8%	1.9%
Acenaphthylene	411	500	82.2%	403	500	80.6%	2.0%
Acenaphthene	385	500	77.0%	379	500	75.8%	1.6%
Dibenzofuran	401	500	80.2%	391	500	78.2%	2.5%
Diethylphthalate	416	500	83.2%	414	500	82.8%	0.5%
Fluorene	401	500	80.2%	393	500	78.6%	2.0%
N-Nitrosodiphenylamine	525	500	105%	528	500	106%	0.6%
Hexachlorobenzene	398	500	79.6%	398	500	79.6%	0.0%
Pentachlorophenol	360	500	72.0%	356	500	71.2%	1.1%
Phenanthrene	395	500	79.0%	395	500	79.0%	0.0%
Anthracene	411	500	82.2%	409	500	81.8%	0.5%
Di-n-Butylphthalate	441	500	88.2%	445	500	89.0%	0.9%
Fluoranthene	425	500	85.0%	429	500	85.8%	0.9%
Pyrene	422	500	84.4%	424	500	84.8%	0.5%
Butylbenzylphthalate	424	500	84.8%	421	500	84.2%	0.7%
Benzo(a)anthracene	393	500	78.6%	393	500	78.6%	0.0%
bis(2-Ethylhexyl)phthalate	433	500	86.6%	436	500	87.2%	0.7%
Chrysene	418	500	83.6%	417	500	83.4%	0.2%
Di-n-Octyl phthalate	410	500	82.0%	414	500	82.8%	1.0%
Benzo(b)fluoranthene	397	500	79.4%	401	500	80.2%	1.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 2 of 2



Sample ID: LCSD-031808

LCS/LCSD

Lab Sample ID: LCS-031808

LIMS ID: 08-5464

Matrix: Sediment

Date Analyzed LCS: 03/20/08 12:26

LCSD: 03/20/08 12:58

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(k)fluoranthene	442	500	88.4%	441	500	88.2%	0.2%
Benzo(a)pyrene	416	500	83.2%	415	500	83.0%	0.2%
Indeno(1,2,3-cd)pyrene	384	500	76.8%	382	500	76.4%	0.5%
Dibenz(a,h)anthracene	407	500	81.4%	401	500	80.2%	1.5%
Benzo(g,h,i)perylene	392	500	78.4%	381	500	76.2%	2.8%
1-Methylnaphthalene	381	500	76.2%	382	500	76.4%	0.3%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	69.6%	69.2%
2-Fluorobiphenyl	77.2%	74.0%
d14-p-Terphenyl	89.6%	87.6%
d4-1,2-Dichlorobenzene	66.4%	66.4%
d5-Phenol	77.3%	76.3%
2-Fluorophenol	74.9%	73.9%
2,4,6-Tribromophenol	87.7%	83.2%
d4-2-Chlorophenol	76.3%	75.5%

Results reported in $\mu\text{g/kg}$

RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN42

Project: PORT OF PORTLAND T6-

Lab File ID: MN42MB

Date Extracted: 03/18/08

Instrument ID: NT6

Date Analyzed: 03/20/08

Matrix: SOLID

Time Analyzed: 1153

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	MN42SB	03/20/08
02	MN42LCSDS1	MN42LCSDS1	MN42SBD	03/20/08
03	T607-C4-Z	MN42D	MN42D	03/20/08
04	T607-C5-Z	MN42E	MN42E	03/20/08
05	T607-C6-Z	MN42F	MN42F	03/20/08
06	T607-MD	MN42G	MN42G	03/20/08
07	T607-MD MS	MN42GMS	MN42GMS	03/20/08
08	T607-MD MSD	MN42GMSD	MN42GMD	03/20/08
09	T601-C1-Z	MN43D	MN43D	03/20/08
10	T601-C2-Z	MN43E	MN43E	03/20/08
11	T601-C3-Z	MN43F	MN43F	03/20/08
12	T601-MD	MN43G	MN43G	03/20/08
13	T501-C12-DPZ	MN44D	MN44D	03/20/08
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 1 of 2



Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 11:53

Instrument/Analyst: NT6/LJR

GPC Cleanup: No

Sample Amount: 25.0 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	14	20	< 20 U
541-73-1	1,3-Dichlorobenzene	7.4	20	< 20 U
106-46-7	1,4-Dichlorobenzene	7.4	20	< 20 U
100-51-6	Benzyl Alcohol	14	20	< 20 U
95-50-1	1,2-Dichlorobenzene	7.9	20	< 20 U
95-48-7	2-Methylphenol	14	20	< 20 U
106-44-5	4-Methylphenol	13	20	< 20 U
67-72-1	Hexachloroethane	7.2	20	< 20 U
105-67-9	2,4-Dimethylphenol	15	20	< 20 U
65-85-0	Benzoic Acid	120	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	9.1	20	< 20 U
91-20-3	Naphthalene	8.7	20	< 20 U
87-68-3	Hexachlorobutadiene	8.1	20	< 20 U
91-57-6	2-Methylnaphthalene	8.2	20	< 20 U
131-11-3	Dimethylphthalate	7.8	20	< 20 U
208-96-8	Acenaphthylene	8.7	20	< 20 U
83-32-9	Acenaphthene	8.2	20	< 20 U
132-64-9	Dibenzofuran	7.6	20	< 20 U
84-66-2	Diethylphthalate	16	20	< 20 U
86-73-7	Fluorene	9.0	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	8.7	20	< 20 U
118-74-1	Hexachlorobenzene	8.0	20	< 20 U
87-86-5	Pentachlorophenol	48	100	< 100 U
85-01-8	Phenanthrene	8.4	20	< 20 U
120-12-7	Anthracene	7.7	20	< 20 U
84-74-2	Di-n-Butylphthalate	12	20	< 20 U
206-44-0	Fluoranthene	7.9	20	< 20 U
129-00-0	Pyrene	7.8	20	< 20 U
85-68-7	Butylbenzylphthalate	11	20	< 20 U
56-55-3	Benzo(a)anthracene	5.9	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	11	20	< 20 U
218-01-9	Chrysene	6.6	20	< 20 U
117-84-0	Di-n-Octyl phthalate	8.3	20	< 20 U
205-99-2	Benzo(b)fluoranthene	9.5	20	< 20 U
207-08-9	Benzo(k)fluoranthene	9.3	20	< 20 U
50-32-8	Benzo(a)pyrene	8.2	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	8.6	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	8.6	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	6.8	20	< 20 U

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
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Sample ID: MB-031808
 METHOD BLANK

Lab Sample ID: MB-031808
 LIMS ID: 08-5464
 Matrix: Sediment
 Date Analyzed: 03/20/08 11:53

QC Report No: MN42-Hart Crowser
 Project: Port of Portland T6-Berth 607
 15667-T2

CAS Number	Analyte	MDL	RL	Result
90-12-0	1-Methylnaphthalene	7.2	20	< 20 U

Reported in $\mu\text{g/kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.0%	2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	89.2%	d4-1,2-Dichlorobenzene	66.8%
d5-Phenol	75.7%	2-Fluorophenol	73.9%
2,4,6-Tribromophenol	81.9%	d4-2-Chlorophenol	76.0%

SIM PNA

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 17:29

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 33.1 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.89	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.2	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	24
86-73-7	Fluorene	0.64	5.0	13
85-01-8	Phenanthrene	1.0	5.0	34
120-12-7	Anthracene	0.96	5.0	7.9
206-44-0	Fluoranthene	0.27	5.0	54
129-00-0	Pyrene	1.2	5.0	50
56-55-3	Benzo(a)anthracene	0.80	5.0	24
218-01-9	Chrysene	1.7	5.0	40
205-99-2	Benzo(b)fluoranthene	1.2	5.0	41
207-08-9	Benzo(k)fluoranthene	0.87	5.0	15
50-32-8	Benzo(a)pyrene	1.5	5.0	24
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	13
53-70-3	Dibenz(a,h)anthracene	0.95	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	1.2	5.0	16
132-64-9	Dibenzofuran	0.97	5.0	< 5.0 U

Reported in $\mu\text{g/kg}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 77.0%
d14-Dibenzo(a,h)anthracene 85.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1

Sample ID: T607-C5-Z

SAMPLE

ANALYTICAL
RESOURCES
INCORPORATED 

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 18:45

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 31.7 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.2	4.8	< 4.8 U
91-57-6	2-Methylnaphthalene	0.87	4.8	< 4.8 U
90-12-0	1-Methylnaphthalene	1.1	4.8	< 4.8 U
208-96-8	Acenaphthylene	1.0	4.8	< 4.8 U
83-32-9	Acenaphthene	1.2	4.8	4.8
86-73-7	Fluorene	0.63	4.8	4.8
85-01-8	Phenanthrene	0.99	4.8	26
120-12-7	Anthracene	0.94	4.8	< 4.8 U
206-44-0	Fluoranthene	0.26	4.8	35
129-00-0	Pyrene	1.2	4.8	31
56-55-3	Benzo (a) anthracene	0.79	4.8	11
218-01-9	Chrysene	1.7	4.8	16
205-99-2	Benzo (b) fluoranthene	1.2	4.8	20
207-08-9	Benzo (k) fluoranthene	0.85	4.8	7.3
50-32-8	Benzo (a) pyrene	1.4	4.8	12
193-39-5	Indeno (1,2,3-cd) pyrene	0.83	4.8	7.3
53-70-3	Dibenz (a,h) anthracene	0.93	4.8	< 4.8 U
191-24-2	Benzo (g,h,i) perylene	1.2	4.8	7.8
132-64-9	Dibenzofuran	0.95	4.8	< 4.8 U

Reported in $\mu\text{g/kg}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 70.7%

d14-Dibenzo (a,h) anthracene 75.7%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: T607-C6-Z

SAMPLE

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 19:10

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 22.9 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.90	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.2	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	16
86-73-7	Fluorene	0.65	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	5.0	38
120-12-7	Anthracene	0.97	5.0	< 5.0 U
206-44-0	Fluoranthene	0.27	5.0	41
129-00-0	Pyrene	1.2	5.0	42
56-55-3	Benzo (a) anthracene	0.81	5.0	12
218-01-9	Chrysene	1.7	5.0	10
205-99-2	Benzo (b) fluoranthene	1.2	5.0	14
207-08-9	Benzo (k) fluoranthene	0.88	5.0	< 5.0 U
50-32-8	Benzo (a) pyrene	1.5	5.0	7.5
193-39-5	Indeno (1,2,3-cd) pyrene	0.86	5.0	< 5.0 U
53-70-3	Dibenz (a,h) anthracene	0.96	5.0	< 5.0 U
191-24-2	Benzo (g,h,i) perylene	1.2	5.0	< 5.0 U
132-64-9	Dibenzofuran	0.98	5.0	< 5.0 U

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	78.3%
d14-Dibenzo (a,h) anthracene	92.0%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: T607-MD

SAMPLE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 19:35

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 32.8 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.89	5.0	5.9
90-12-0	1-Methylnaphthalene	1.2	5.0	9.9
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	89
86-73-7	Fluorene	0.64	5.0	76
85-01-8	Phenanthrene	1.0	5.0	270
120-12-7	Anthracene	0.96	5.0	31
206-44-0	Fluoranthene	0.27	5.0	210
129-00-0	Pyrene	1.2	5.0	200
56-55-3	Benzo (a) anthracene	0.80	5.0	61
218-01-9	Chrysene	1.7	5.0	86
205-99-2	Benzo (b) fluoranthene	1.2	5.0	77
207-08-9	Benzo (k) fluoranthene	0.87	5.0	29
50-32-8	Benzo (a) pyrene	1.5	5.0	46
193-39-5	Indeno (1,2,3-cd) pyrene	0.85	5.0	23
53-70-3	Dibenz (a,h) anthracene	0.95	5.0	7.9
191-24-2	Benzo (g,h,i) perylene	1.2	5.0	25
132-64-9	Dibenzofuran	0.97	5.0	21

Reported in $\mu\text{g/kg}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 74.7%

d14-Dibenzo(a,h)anthracene 79.3%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

Client ID	MNP	DBA	TOT OUT
MB-031808	80.0%	94.7%	0
LCS-031808	74.3%	93.3%	0
LCSD-031808	78.7%	96.7%	0
T607-C4-Z	77.0%	85.3%	0
T607-C4-Z MS	73.7%	83.3%	0
T607-C4-Z MSD	77.3%	91.7%	0
T607-C5-Z	70.7%	75.7%	0
T607-C6-Z	78.3%	92.0%	0
T607-MD	74.7%	79.3%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(44-100)	(37-106)
(DBA) = d14-Dibenzo(a,h)anthracene	(46-121)	(16-118)

Prep Method: SW3550B
Log Number Range: 08-5461 to 08-5464

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1



Sample ID: T607-C4-Z
MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/26/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted MS/MSD: 03/18/08

Sample Amount MS: 10.1 g-dry-wt

MSD: 10.1 g-dry-wt

Date Analyzed MS: 03/19/08 17:54

Final Extract Volume MS: 0.50 mL

MSD: 03/19/08 18:20

MSD: 0.50 mL

Instrument/Analyst MS: NT1/VTs

Dilution Factor MS: 1.00

MSD: NT1/VTs

MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 5.0 U	98.5	149	66.1%	102	149	68.5%	3.5%
2-Methylnaphthalene	< 5.0 U	110	149	73.8%	115	149	77.2%	4.4%
1-Methylnaphthalene	< 5.0 U	106	149	71.1%	111	149	74.5%	4.6%
Acenaphthylene	< 5.0 U	122	149	81.9%	125	149	83.9%	2.4%
Acenaphthene	23.8	150	149	84.7%	149	149	84.0%	0.7%
Fluorene	13.4	143	149	87.0%	148	149	90.3%	3.4%
Phenanthrene	33.7	166	149	88.8%	164	149	87.4%	1.2%
Anthracene	7.9	149	149	94.7%	150	149	95.4%	0.7%
Fluoranthene	54.0	196	149	95.3%	200	149	98.0%	2.0%
Pyrene	50.0	182	149	88.6%	188	149	92.6%	3.2%
Benzo(a)anthracene	24.3	166	149	95.1%	175	149	101%	5.3%
Chrysene	40.1	179	149	93.2%	182	149	95.2%	1.7%
Benzo(b)fluoranthene	41.1	179	149	92.6%	184	149	95.9%	2.8%
Benzo(k)fluoranthene	15.3	158	149	95.8%	169	149	103%	6.7%
Benzo(a)pyrene	23.8	163	149	93.4%	176	149	102%	7.7%
Indeno(1,2,3-cd)pyrene	12.9	132	149	79.9%	149	149	91.3%	12.1%
Dibenz(a,h)anthracene	< 5.0 U	119	149	79.9%	136	149	91.3%	13.3%
Benzo(g,h,i)perylene	15.8	127	149	74.6%	142	149	84.7%	11.2%
Dibenzofuran	< 5.0 U	122	149	81.9%	126	149	84.6%	3.2%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1



Sample ID: T607-C4-Z

MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 17:54

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 33.1 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	---
91-57-6	2-Methylnaphthalene	0.89	5.0	---
90-12-0	1-Methylnaphthalene	1.2	5.0	---
208-96-8	Acenaphthylene	1.0	5.0	---
83-32-9	Acenaphthene	1.2	5.0	---
86-73-7	Fluorene	0.64	5.0	---
85-01-8	Phenanthrene	1.0	5.0	---
120-12-7	Anthracene	0.96	5.0	---
206-44-0	Fluoranthene	0.27	5.0	---
129-00-0	Pyrene	1.2	5.0	---
56-55-3	Benzo(a)anthracene	0.80	5.0	---
218-01-9	Chrysene	1.7	5.0	---
205-99-2	Benzo(b)fluoranthene	1.2	5.0	---
207-08-9	Benzo(k)fluoranthene	0.87	5.0	---
50-32-8	Benzo(a)pyrene	1.5	5.0	---
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	---
53-70-3	Dibenz(a,h)anthracene	0.95	5.0	---
191-24-2	Benzo(g,h,i)perylene	1.2	5.0	---
132-64-9	Dibenzofuran	0.97	5.0	---

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 73.7%

d14-Dibenzo(a,h)anthracene 83.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1




Sample ID: T607-C4-Z

MATRIX SPIKE DUP

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 18:20

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: 33.1 %

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	---
91-57-6	2-Methylnaphthalene	0.89	5.0	---
90-12-0	1-Methylnaphthalene	1.2	5.0	---
208-96-8	Acenaphthylene	1.0	5.0	---
83-32-9	Acenaphthene	1.2	5.0	---
86-73-7	Fluorene	0.64	5.0	---
85-01-8	Phenanthrene	1.0	5.0	---
120-12-7	Anthracene	0.96	5.0	---
206-44-0	Fluoranthene	0.27	5.0	---
129-00-0	Pyrene	1.2	5.0	---
56-55-3	Benzo(a)anthracene	0.80	5.0	---
218-01-9	Chrysene	1.7	5.0	---
205-99-2	Benzo(b)fluoranthene	1.2	5.0	---
207-08-9	Benzo(k)fluoranthene	0.87	5.0	---
50-32-8	Benzo(a)pyrene	1.5	5.0	---
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	---
53-70-3	Dibenz(a,h)anthracene	0.95	5.0	---
191-24-2	Benzo(g,h,i)perylene	1.2	5.0	---
132-64-9	Dibenzofuran	0.97	5.0	---

Reported in $\mu\text{g/kg}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 77.3%

d14-Dibenzo(a,h)anthracene 91.7%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: LCS-031808

LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/26/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Sample Amount LCS: 10.0 g-dry-wt

LCSD: 10.0 g-dry-wt

Date Analyzed LCS: 03/19/08 16:39

Final Extract Volume LCS: 0.50 mL

LCSD: 03/19/08 17:04

LCSD: 0.50 mL

Instrument/Analyst LCS: NT1/VTs

Dilution Factor LCS: 1.00

LCSD: NT1/VTs

LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	104	150	69.3%	112	150	74.7%	7.4%
2-Methylnaphthalene	112	150	74.7%	118	150	78.7%	5.2%
1-Methylnaphthalene	108	150	72.0%	112	150	74.7%	3.6%
Acenaphthylene	115	150	76.7%	120	150	80.0%	4.3%
Acenaphthene	118	150	78.7%	122	150	81.3%	3.3%
Fluorene	125	150	83.3%	134	150	89.3%	6.9%
Phenanthrene	132	150	88.0%	134	150	89.3%	1.5%
Anthracene	134	150	89.3%	142	150	94.7%	5.8%
Fluoranthene	145	150	96.7%	147	150	98.0%	1.4%
Pyrene	140	150	93.3%	144	150	96.0%	2.8%
Benzo(a)anthracene	148	150	98.7%	152	150	101%	2.7%
Chrysene	140	150	93.3%	144	150	96.0%	2.8%
Benzo(b)fluoranthene	148	150	98.7%	145	150	96.7%	2.0%
Benzo(k)fluoranthene	137	150	91.3%	156	150	104%	13.0%
Benzo(a)pyrene	141	150	94.0%	154	150	103%	8.8%
Indeno(1,2,3-cd)pyrene	136	150	90.7%	144	150	96.0%	5.7%
Dibenz(a,h)anthracene	138	150	92.0%	148	150	98.7%	7.0%
Benzo(g,h,i)perylene	128	150	85.3%	133	150	88.7%	3.8%
Dibenzofuran	116	150	77.3%	122	150	81.3%	5.0%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
dl0-2-Methylnaphthalene	74.3%	78.7%
dl4-Dibenzo(a,h)anthracen	93.3%	96.7%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN44

Project: PORT OF TORTLAND T6-

Lab File ID: MN42MB

Date Extracted: 03/18/08

Instrument ID: NT1

Date Analyzed: 03/19/08

Matrix: SOLID

Time Analyzed: 1614

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	MN42LCSS1	MN42LCSS1	MN42SB	03/19/08
02	MN42LCSDS1	MN42LCSDS1	MN42SBD	03/19/08
03	T607-C4-Z	MN42D	MN42D	03/19/08
04	T607-C4-Z MS	MN42DMS	MN42DMS	03/19/08
05	T607-C4-Z MSD	MN42DMSD	MN42DMSD	03/19/08
06	T607-C5-Z	MN42E	MN42E	03/19/08
07	T607-C6-Z	MN42F	MN42F	03/19/08
08	T607-MD	MN42G	MN42G	03/19/08
09	T601-C1-Z	MN43D	MN43D	03/19/08
10	T601-C2-Z	MN43E	MN43E	03/19/08
11	T601-C3-Z	MN43F	MN43F	03/19/08
12	T601-MD	MN43G	MN43G	03/19/08
13	T501-C12-DPZ	MN44D	MN44D	03/19/08
14				
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET

PNAs by Selected Ion Monitoring GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/19/08 16:14

Instrument/Analyst: NT1/VTS

GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
91-20-3	Naphthalene	1.3	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	0.90	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.2	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.0	5.0	< 5.0 U
83-32-9	Acenaphthene	1.2	5.0	< 5.0 U
86-73-7	Fluorene	0.65	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	5.0	< 5.0 U
120-12-7	Anthracene	0.97	5.0	< 5.0 U
206-44-0	Fluoranthene	0.27	5.0	< 5.0 U
129-00-0	Pyrene	1.2	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.81	5.0	< 5.0 U
218-01-9	Chrysene	1.7	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	1.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	0.88	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	1.5	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.86	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	0.96	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	1.2	5.0	< 5.0 U
132-64-9	Dibenzofuran	0.98	5.0	< 5.0 U

Reported in $\mu\text{g/kg}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 80.0%

d14-Dibenzo(a,h)anthracene 94.7%

TBT

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T607-C4-Z
SAMPLE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 14:57

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.04 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 33.1%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.8	3.8	4.5	
DBT_ION	Dibutyl Tin Ion	3.2	5.7	< 5.7	U
BT_ION	Butyl Tin Ion	4.0	4.0	< 4.0	U

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	84.2%
Triphenyl Tin Chloride	110%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1




Sample ID: T607-C5-Z

SAMPLE

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:56

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.15 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.8	380 E	
DBT_ION	Dibutyl Tin Ion	3.1	5.6	15	
BT_ION	Butyl Tin Ion	4.0	4.0	3.3 J	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	73.8%
Triphenyl Tin Chloride	98.5%


ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T607-C5-Z
DILUTION

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/22/08 11:49

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.15 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 5.00

Alumina Cleanup: Yes

Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	8.6	19	350	
DBT_ION	Dibutyl Tin Ion	15	28	< 28 U	
BT_ION	Butyl Tin Ion	20	20	< 20 U	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	68.1%
Tripropyl Tin Chloride	86.3%


ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T607-C6-Z
SAMPLE

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:16

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.03 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.8	3.8	5.2	
DBT_ION	Dibutyl Tin Ion	3.2	5.8	< 5.8	U
BT_ION	Butyl Tin Ion	4.1	4.1	< 4.1	U

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	73.5%
Triphenyl Tin Chloride	86.5%

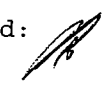
ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1ANALYTICAL
RESOURCES
INCORPORATED Sample ID: T607-MD
SAMPLE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: 

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:35

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.07 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.7	3.8	160	
DBT_ION	Dibutyl Tin Ion	3.1	5.7	20	
BT_ION	Butyl Tin Ion	4.0	4.0	4.9	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	80.3%
Triphenyl Tin Chloride	100%

TBT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
Event: 15667-T2

Client ID	TPRT	TPNT	TOT OUT
MB-031808	71.1%	85.3%	0
LCS-031808	72.1%	87.7%	0
LCSD-031808	78.3%	104%	0
T607-C4-Z	84.2%	110%	0
T607-C4-Z MS	69.1%	85.4%	0
T607-C4-Z MSD	71.1%	99.7%	0
T607-C5-Z	73.8%	98.5%	0
T607-C5-Z DL	68.1%	86.3%	0
T607-C6-Z	73.5%	86.5%	0
T607-MD	80.3%	100%	0

	LCS/MB LIMITS	QC LIMITS
(TPRT) = Tripropyl Tin Chloride	(37-99)	(25-96)
(TPNT) = Tripentyl Tin Chloride	(47-130)	(30-136)

Prep Method: SW3550B
Analytical Method: TBT (Hexyl) Krone 1988
Log Number Range: 08-5461 to 08-5464

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

Sample ID: T607-C4-Z

MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted MS: 03/18/08

Sample Amount MS: 5.02 g-dry-wt

MSD: 5.02 g-dry-wt

Date Analyzed MS: 03/21/08 15:17

Final Extract Volume MS: 0.5 mL

MSD: 03/21/08 15:36

MSD: 0.5 mL

Instrument/Analyst MS: NT2/VT

Dilution Factor MS: 1.00

MSD: NT2/VT

MSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes

Moisture: 33.1%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Tributyl Tin Ion	4.5	40.8	44.4	81.8%	41.0	44.4	82.2%	0.5%
Dibutyl Tin Ion	< 5.7 U	9.9	38.2	25.9%	23.5	38.2	61.5%	81.4%
Butyl Tin Ion	< 4.0 U	3.9 J	31.0	12.6%	14.8	31.0	47.7%	117%

Results reported in $\mu\text{g/kg}$

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T607-C4-Z

MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:17

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.02 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 33.1%

CAS Number	Analyte	RL	Result	Q
TBT_ION	Tributyl Tin Ion	3.8	---	
DBT_ION	Dibutyl Tin Ion	5.8	---	
BT_ION	Butyl Tin Ion	4.1	---	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	69.1%
Triphenyl Tin Chloride	85.4%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T607-C4-Z

MATRIX SPIKE DUP

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:36

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.02 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 33.1%

CAS Number	Analyte	RL	Result	Q
TBT_ION	Tributyl Tin Ion	3.8	---	
DBT_ION	Dibutyl Tin Ion	5.8	---	
BT_ION	Butyl Tin Ion	4.1	---	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	71.1%
Tripropyl Tin Chloride	99.7%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: LCS-031808

LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized:

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted LCS: 03/18/08

Sample Amount LCS: 5.00 g-dry-wt

LCSD: 5.00 g-dry-wt

Date Analyzed LCS: 03/21/08 14:19

Final Extract Volume LCS: 0.50 mL

LCSD: 03/21/08 14:38

LCSD: 0.50 mL

Instrument/Analyst LCS: NT2/VTs

Dilution Factor LCS: 1.00

LCSD: NT2/VTs

LCSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Tributyl Tin Ion	35.2	44.6	78.9%	44.5	44.6	99.8%	23.3%
Dibutyl Tin Ion	27.7	38.4	72.1%	35.7	38.4	93.0%	25.2%
Butyl Tin Ion	18.0	31.2	57.7%	24.5	31.2	78.5%	30.6%

Reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
Tripropyl Tin Chloride	72.1%	78.3%
Triphenyl Tin Chloride	87.7%	104%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No: MN44

Project: PORT OF PORTLAND T6-

Lab File ID: 032101

Date Extracted: 03/18/08

Instrument ID: NT2

Date Analyzed: 03/21/08

Matrix: SOLID

Time Analyzed: 1359

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	032102	03/21/08
02	MN42LCSDS1	MN42LCSDS1	032103	03/21/08
03	T607-C4-Z	MN42D	032104	03/21/08
04	T607-C4-Z MS	MN42DMS	032105	03/21/08
05	T607-C4-Z MSD	MN42DMSD	032106	03/21/08
06	T607-C5-Z	MN42E	032107	03/21/08
07	T607-C6-Z	MN42F	032108	03/21/08
08	T607-MD	MN42G	032109	03/21/08
09	T601-C1-Z	MN43D	032110	03/21/08
10	T601-C2-Z	MN43E	032111	03/21/08
11	T601-C3-Z	MN43F	032112	03/21/08
12	T601-MD	MN43G	032113	03/21/08
13	T501-C12-DPZ	MN44D	032114	03/21/08
14	T607-C5-Z	MN42EDL	MN42EDL	03/22/08
15				
16				
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25				
26				
27				
28				
29				
30				

COMMENTS:

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 03/24/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

Event: 15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 13:59

Instrument/Analyst: NT2/VTS

Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

CAS Number	Analyte	MDL	RL	Result	Q
TBT_ION	Tributyl Tin Ion	1.8	3.9	< 3.9 U	
DBT_ION	Dibutyl Tin Ion	3.2	5.8	< 5.8 U	
BT_ION	Butyl Tin Ion	4.1	4.1	< 4.1 U	

Reported in $\mu\text{g/kg}$ (ppb)

TBT Surrogate Recovery


Tripropyl Tin Chloride	71.1%
Tripropyl Tin Chloride	85.3%

PESTICIDES

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T607-C4-Z
SAMPLE

Lab Sample ID: MN42D
LIMS ID: 08-5461
Matrix: Sediment
Data Release Authorized: 
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 13:40
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 33.1%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.48	0.98	< 0.98 U
76-44-8	Heptachlor	0.40	0.98	< 0.98 U
309-00-2	Aldrin	0.47	0.98	< 0.98 U
60-57-1	Dieldrin	0.83	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	3.3
72-54-8	4,4'-DDD	1.3	2.0	2.0 J
50-29-3	4,4'-DDT	0.87	2.0	1.6 J
5103-74-2	gamma Chlordane	0.91	0.98	< 0.98 U
5103-71-9	alpha Chlordane	0.36	0.98	< 0.98 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	83.5%
Tetrachlorometaxylene	66.5%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T607-C5-Z
SAMPLE

Lab Sample ID: MN42E
LIMS ID: 08-5462
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 13:59
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	0.99	< 0.99 U
76-44-8	Heptachlor	0.40	0.99	< 0.99 U
309-00-2	Aldrin	0.47	0.99	< 0.99 U
60-57-1	Dieldrin	0.83	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	2.3
72-54-8	4,4'-DDD	1.3	2.0	< 2.0 U
50-29-3	4,4'-DDT	0.87	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.91	0.99	< 0.99 U
5103-71-9	alpha Chlordane	0.36	0.99	< 0.99 U

Reported in $\mu\text{g/kg}$ (ppb)


Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.2%
Tetrachlorometaxylene	67.2%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1



Sample ID: T607-C6-Z
SAMPLE

Lab Sample ID: MN42F
LIMS ID: 08-5463
Matrix: Sediment
Data Release Authorized: 
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 14:19
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.48	0.98	< 0.98 U
76-44-8	Heptachlor	0.40	0.98	< 0.98 U
309-00-2	Aldrin	0.47	0.98	< 0.98 U
60-57-1	Dieldrin	0.83	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.1	2.0	< 2.0 U
72-54-8	4,4'-DDD	1.2	2.0	< 2.0 U
50-29-3	4,4'-DDT	0.87	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.91	0.98	< 0.98 U
5103-71-9	alpha Chlordane	0.36	0.98	< 0.98 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	94.0%
Tetrachlorometaxylene	67.2%

Sample ID: T607-MD
SAMPLE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 15:17

Instrument/Analyst: ECD4/YZ

GPC Cleanup: No

Sulfur Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 5.0 mL

Dilution Factor: 2.00

Silica Gel: Yes

Percent Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.96	2.0	< 2.0 U
76-44-8	Heptachlor	0.79	2.0	< 2.0 U
309-00-2	Aldrin	0.94	2.0	< 2.0 U
60-57-1	Dieldrin	1.6	3.9	< 3.9 U
72-55-9	4,4'-DDE	2.3	3.9	2.0 J
72-54-8	4,4'-DDD	2.5	3.9	< 3.9 U
50-29-3	4,4'-DDT	1.7	3.9	< 3.9 U
5103-74-2	gamma Chlordane	1.8	2.0	< 2.0 U
5103-71-9	alpha Chlordane	0.72	2.0	< 2.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	69.0%

SW8081 PESTICIDE SOLID SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

Client ID	DCBP	TCMX	TOT OUT
T607-C4-Z	83.5%	66.5%	0
T607-C5-Z	91.2%	67.2%	0
MB-031808	104%	90.5%	0
LCS-031808	91.5%	80.8%	0
LCSD-031808	97.5%	85.0%	0
T607-C6-Z	94.0%	67.2%	0
T607-C6-Z MS	81.8%	67.2%	0
T607-C6-Z MSD	89.8%	72.0%	0
T607-MD	106%	69.0%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(65-125)	(52-143)
(TCMX) = Tetrachlorometaxylene	(53-112)	(43-128)

Prep Method: SW3550B
Log Number Range: 08-5461 to 08-5464

Sample ID: T607-C6-Z
MS/MSD

Lab Sample ID: MN42F
LIMS ID: 08-5463
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted MS/MSD: 03/18/08
Date Analyzed MS: 03/20/08 14:38
MSD: 03/20/08 14:58
Instrument/Analyst MS: ECD4/YZ
MSD: ECD4/YZ

Sample Amount MS: 25.5 g-dry-wt
MSD: 25.5 g-dry-wt
Final Extract Volume MS: 5.0 mL
MSD: 5.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: Yes

GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Percent Moisture: 22.9%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
gamma-BHC (Lindane)	< 0.981	3.95	3.93	101%	3.95	3.93	101%	0.0%
Heptachlor	< 0.981	3.40	3.93	86.5%	3.42	3.93	87.0%	0.6%
Aldrin	< 0.981	3.48	3.93	88.5%	3.48	3.93	88.5%	0.0%
Dieldrin	< 1.96	6.91	7.86	87.9%	7.82	7.86	99.5%	12.4%
4,4'-DDE	< 1.96	7.80	7.86	99.2%	8.92	7.86	113%	13.4%
4,4'-DDD	< 1.96	7.31	7.86	93.0%	8.62	7.86	110%	16.4%
4,4'-DDT	< 1.96	7.11	7.86	90.5%	7.60	7.86	96.7%	6.7%
gamma Chlordane	< 0.981	3.04	3.93	77.4%	3.24	3.93	82.4%	6.4%
alpha Chlordane	< 0.981	3.52	3.93	89.6%	3.81	3.93	96.9%	7.9%

Reported in $\mu\text{g/kg}$ (ppb)


RPD calculated using sample concentrations per SW846.

Sample ID: T607-C6-Z
MATRIX SPIKE

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: 

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 14:38

Instrument/Analyst: ECD4/YZ

GPC Cleanup: No

Sulfur Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.48	0.98	---
76-44-8	Heptachlor	0.40	0.98	---
309-00-2	Aldrin	0.47	0.98	---
60-57-1	Dieldrin	0.83	2.0	---
72-55-9	4,4'-DDE	1.1	2.0	---
72-54-8	4,4'-DDD	1.3	2.0	---
50-29-3	4,4'-DDT	0.87	2.0	---
5103-74-2	gamma Chlordane	0.91	0.98	---
5103-71-9	alpha Chlordane	0.36	0.98	---

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	81.8%
Tetrachlorometaxylene	67.2%

Sample ID: T607-C6-Z
MATRIX SPIKE DUP

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 03/21/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/20/08 14:58

Instrument/Analyst: ECD4/YZ

GPC Cleanup: No

Sulfur Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.48	0.98	---
76-44-8	Heptachlor	0.40	0.98	---
309-00-2	Aldrin	0.47	0.98	---
60-57-1	Dieldrin	0.83	2.0	---
72-55-9	4,4'-DDE	1.1	2.0	---
72-54-8	4,4'-DDD	1.3	2.0	---
50-29-3	4,4'-DDT	0.87	2.0	---
5103-74-2	gamma Chlordane	0.91	0.98	---
5103-71-9	alpha Chlordane	0.36	0.98	---

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	89.8%
Tetrachlorometaxylene	72.0%

Sample ID: LCS-031808
LCS/LCSD

Lab Sample ID: LCS-031808
LIMS ID: 08-5463
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g-dry-wt

Date Analyzed LCS: 03/20/08 13:01

LCSD: 25.0 g-dry-wt

LCSD: 03/20/08 13:20

Final Extract Volume LCS: 5.0 mL

Instrument/Analyst LCS: ECD4/YZ

LCSD: 5.0 mL

LCSD: ECD4/YZ

Dilution Factor LCS: 1.00

LCSD: 1.00

GPC Cleanup: No

Silica Gel: Yes

Sulfur Cleanup: Yes

Florisil Cleanup: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
gamma-BHC (Lindane)	4.36	4.00	109%	4.56	4.00	114%	4.5%
Heptachlor	3.44	4.00	86.0%	3.92	4.00	98.0%	13.0%
Aldrin	4.26	4.00	106%	4.20	4.00	105%	1.4%
Dieldrin	8.34	8.00	104%	8.72	8.00	109%	4.5%
4,4'-DDE	8.70	8.00	109%	9.34	8.00	117%	7.1%
4,4'-DDD	8.12	8.00	102%	8.64	8.00	108%	6.2%
4,4'-DDT	7.80	8.00	97.5%	8.12	8.00	102%	4.0%
gamma Chlordane	4.10	4.00	102%	4.16	4.00	104%	1.5%
alpha Chlordane	4.34	4.00	108%	4.46	4.00	112%	2.7%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	91.5%	97.5%
Tetrachlorometaxylene	80.8%	85.0%

Reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

SAMPLE NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No.: MN42

Project: PORT OF PORTLAND T5

Lab Sample ID: MN42MBS1

Lab File ID: 0320A007

Matrix (soil/water) SOLID

Extraction: (SepF/Cont/Sonc) SW3550B

Sulfur Cleanup (Y/N) Y

Date Extracted: 03/18/08

Date Analyzed (1): 03/20/08

Date Analyzed (2): 03/20/08

Time Analyzed (1): 1241

Time Analyzed (2): 1241

Instrument ID (1): ECD4

Instrument ID (2): ECD4

GC Column (1): STX-CLP1 ID: 0.53(mm) GC Column (2): STX-CLP2 ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	=====	=====	=====	=====
01	MN42LCSS1	MN42LCSS1	03/20/08	03/20/08
02	MN42LCSDS1	MN42LCSDS1	03/20/08	03/20/08
03	T607-C4-Z	MN42D	03/20/08	03/20/08
04	T607-C5-Z	MN42E	03/20/08	03/20/08
05	T607-C6-Z	MN42F	03/20/08	03/20/08
06	T607-C6-Z MS	MN42FMS	03/20/08	03/20/08
07	T607-C6-Z MS	MN42FMSD	03/20/08	03/20/08
08	T607-MD	MN42G	03/20/08	03/20/08
09	T601-C1-Z	MN43D	03/20/08	03/20/08
10	T601-C2-Z	MN43E	03/20/08	03/20/08
11	T601-C3-Z	MN43F	03/20/08	03/20/08
12	T601-MD	MN43G	03/20/08	03/20/08
13	T501-C12-DPZ	MN44D	03/20/08	03/20/08

Sample ID: MB-031808
METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5463
Matrix: Sediment
Data Release Authorized:
Reported: 03/21/08

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2
Date Sampled: NA
Date Received: NA

Date Extracted: 03/18/08
Date Analyzed: 03/20/08 12:41
Instrument/Analyst: ECD4/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.49	1.0	< 1.0 U
76-44-8	Heptachlor	0.40	1.0	< 1.0 U
309-00-2	Aldrin	0.48	1.0	< 1.0 U
60-57-1	Dieldrin	0.84	2.0	< 2.0 U
72-55-9	4,4'-DDE	1.2	2.0	< 2.0 U
72-54-8	4,4'-DDD	1.3	2.0	< 2.0 U
50-29-3	4,4'-DDT	0.88	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.92	1.0	< 1.0 U
5103-71-9	alpha Chlordane	0.37	1.0	< 1.0 U

Reported in $\mu\text{g/kg}$ (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	90.5%

PCBS

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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Sample ID: T607-C4-Z

SAMPLE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: YW

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 14:59

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.4 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 33.1%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	9.8	< 9.8 U
53469-21-9	Aroclor 1242	3.3	9.8	< 9.8 U
12672-29-6	Aroclor 1248	3.3	9.8	< 9.8 U
11097-69-1	Aroclor 1254	3.3	9.8	< 9.8 U
11096-82-5	Aroclor 1260	3.3	9.8	< 9.8 U
11104-28-2	Aroclor 1221	3.3	9.8	< 9.8 U
11141-16-5	Aroclor 1232	3.3	9.8	< 9.8 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.5%
Tetrachlorometaxylene	77.2%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T607-C5-Z

SAMPLE

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *WWJ*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:16

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.3 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	9.9	< 9.9 U
53469-21-9	Aroclor 1242	3.3	9.9	< 9.9 U
12672-29-6	Aroclor 1248	3.3	9.9	< 9.9 U
11097-69-1	Aroclor 1254	3.3	9.9	< 9.9 U
11096-82-5	Aroclor 1260	3.3	15	< 15 Y
11104-28-2	Aroclor 1221	3.3	9.9	< 9.9 U
11141-16-5	Aroclor 1232	3.3	9.9	< 9.9 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	87.0%
Tetrachlorometaxylene	74.5%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T607-C6-Z

SAMPLE

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized: *WW*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:07

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.4 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 22.9%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	9.8	< 9.8 U
53469-21-9	Aroclor 1242	3.3	9.8	< 9.8 U
12672-29-6	Aroclor 1248	3.3	9.8	< 9.8 U
11097-69-1	Aroclor 1254	3.3	9.8	< 9.8 U
11096-82-5	Aroclor 1260	3.3	9.8	< 9.8 U
11104-28-2	Aroclor 1221	3.3	9.8	< 9.8 U
11141-16-5	Aroclor 1232	3.3	9.8	< 9.8 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.0%
Tetrachlorometaxylene	77.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: T607-MD

SAMPLE



Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: *mmw*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 16:24

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.6 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 32.8%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.2	9.8	< 9.8 U
53469-21-9	Aroclor 1242	3.2	9.8	< 9.8 U
12672-29-6	Aroclor 1248	3.2	9.8	< 9.8 U
11097-69-1	Aroclor 1254	3.2	9.8	< 9.8 U
11096-82-5	Aroclor 1260	3.2	9.8	< 9.8 U
11104-28-2	Aroclor 1221	3.2	9.8	< 9.8 U
11141-16-5	Aroclor 1232	3.2	9.8	< 9.8 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	93.8%
Tetrachlorometaxylene	76.8%

SW8082/PCB SOLIDS SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: MN42-Hart Crowser
Project: Port of Portland T6-Berth 607
15667-T2

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
T607-C4-Z	81.5%	33-149	77.2%	32-121	0
MB-031808	92.5%	36-130	89.8%	30-119	0
LCS-031808	92.5%	36-130	85.2%	30-119	0
LCSD-031808	89.5%	36-130	85.0%	30-119	0
T607-C5-Z	87.0%	33-149	74.5%	32-121	0
T607-C5-Z MS	83.8%	33-149	73.0%	32-121	0
T607-C5-Z MSD	87.0%	33-149	84.8%	32-121	0
T607-C6-Z	99.0%	33-149	77.0%	32-121	0
T607-MD	93.8%	33-149	76.8%	32-121	0

Prep Method: SW3550B
Log Number Range: 08-5461 to 08-5464

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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Sample ID: T607-C5-Z

MS/MSD

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *MM*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted MS/MSD: 03/18/08

Sample Amount MS: 25.3 g-dry-wt

MSD: 25.3 g-dry-wt

Date Analyzed MS: 03/21/08 15:33

Final Extract Volume MS: 2.5 mL

MSD: 03/21/08 15:50

MSD: 2.5 mL

Instrument/Analyst MS: ECD5/PK

Dilution Factor MS: 1.00

MSD: ECD5/PK

MSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Percent Moisture: 31.7%

Florisil Cleanup: No

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 9.9 U	34.4	49.8	69.1%	35.6	49.8	71.5%	3.4%
Aroclor 1260	< 14.8 Y	40.6	49.8	81.5%	49.4	49.8	99.2%	19.6%

Results reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED 

Sample ID: T607-C5-Z

MATRIX SPIKE

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *MW*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:33

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.3 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	9.9	---
53469-21-9	Aroclor 1242	3.3	9.9	< 9.9 U
12672-29-6	Aroclor 1248	3.3	9.9	< 9.9 U
11097-69-1	Aroclor 1254	3.3	9.9	< 9.9 U
11096-82-5	Aroclor 1260	3.3	9.9	---
11104-28-2	Aroclor 1221	3.3	9.9	< 9.9 U
11141-16-5	Aroclor 1232	3.3	9.9	< 9.9 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.8%
Tetrachlorometaxylene	73.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: T607-C5-Z

MATRIX SPIKE DUP

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *MMW*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 15:50

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.3 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	9.9	---
53469-21-9	Aroclor 1242	3.3	9.9	< 9.9 U
12672-29-6	Aroclor 1248	3.3	9.9	< 9.9 U
11097-69-1	Aroclor 1254	3.3	9.9	< 9.9 U
11096-82-5	Aroclor 1260	3.3	9.9	---
11104-28-2	Aroclor 1221	3.3	9.9	< 9.9 U
11141-16-5	Aroclor 1232	3.3	9.9	< 9.9 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	87.0%
Tetrachlorometaxylene	84.8%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: LCS-031808

LCS/LCSD

Lab Sample ID: LCS-031808

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *W*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 03/18/08

Sample Amount LCS: 25.0 g-dry-wt

LCSD: 25.0 g-dry-wt

Date Analyzed LCS: 03/21/08 14:24

Final Extract Volume LCS: 2.5 mL

LCSD: 03/21/08 14:42

LCSD: 2.5 mL

Instrument/Analyst LCS: ECD5/PK

Dilution Factor LCS: 1.00

LCSD: ECD5/PK

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Percent Moisture: NA

Florisil Cleanup: No

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	38.7	50.4	76.8%	38.3	50.4	76.0%	1.0%
Aroclor 1260	43.6	50.4	86.5%	42.4	50.4	84.1%	2.8%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	92.5%	89.5%
Tetrachlorometaxylene	85.2%	85.0%

Results reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

MN42MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER

ARI Job No.: MN42

Project: PORT OF PORTLAND T6-

Lab Sample ID: MN42MBS1

Lab File ID: 0321B015

Date Extracted: 03/18/08

Matrix: SOLID

Date Analyzed: 03/21/08

Instrument ID: ECD5

Time Analyzed: 1407

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO. =====	LAB SAMPLE ID =====	DATE ANALYZED =====
01	MN42LCSS1	MN42LCSS1	03/21/08
02	MN42LCSDS1	MN42LCSDS1	03/21/08
03	T607-C4-Z	MN42D	03/21/08
04	T607-C5-Z	MN42E	03/21/08
05	T607-C5-Z MS	MN42EMS	03/21/08
06	T607-C5-Z MSD	MN42EMSD	03/21/08
07	T607-C6-Z	MN42F	03/21/08
08	T607-MD	MN42G	03/21/08
09	T601-C1-Z	MN43D	03/21/08
10	T601-C2-Z	MN43E	03/21/08
11	T601-C3-Z	MN43F	03/21/08
12	T601-MD	MN43G	03/21/08
13	T501-C12-DPZ	MN44D	03/21/08

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

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ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: MB-031808

METHOD BLANK

Lab Sample ID: MB-031808

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: *mw*

Reported: 03/25/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

Date Extracted: 03/18/08

Date Analyzed: 03/21/08 14:07

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 25.0 g

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	3.3	10	< 10 U
53469-21-9	Aroclor 1242	3.3	10	< 10 U
12672-29-6	Aroclor 1248	3.3	10	< 10 U
11097-69-1	Aroclor 1254	3.3	10	< 10 U
11096-82-5	Aroclor 1260	3.3	10	< 10 U
11104-28-2	Aroclor 1221	3.3	10	< 10 U
11141-16-5	Aroclor 1232	3.3	10	< 10 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	92.5%
Tetrachlorometaxylene	89.8%

METALS

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: T607-C4-Z
SAMPLE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 65.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.19	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.29	0.3	3.8	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.029	0.3	0.9	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.41	0.7	18.9	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.058	0.3	27.5	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.29	3	12	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0052	0.05	0.08	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.45	1	17	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.16	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.41	1	135	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

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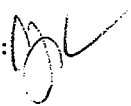
Sample ID: T607-C4-Z

DUPLICATE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	200.8	0.3 U	0.3 U	0.0%	+/- 0.3	L
Arsenic	200.8	3.8	3.5	8.2%	+/- 20%	
Cadmium	6010B	0.9	0.9	0.0%	+/- 0.3	L
Chromium	6010B	18.9	18.3	3.2%	+/- 20%	
Copper	6010B	27.5	25.2	8.7%	+/- 20%	
Lead	6010B	12	12	0.0%	+/- 3	L
Mercury	7471A	0.08	0.09	11.8%	+/- 0.05	L
Nickel	6010B	17	16	6.1%	+/- 20%	
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	135	130	3.8%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

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Sample ID: T607-C4-Z

MATRIX SPIKE

Lab Sample ID: MN42D

LIMS ID: 08-5461

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	200.8	0.3 U	1.0	36.9	2.7%	N
Arsenic	200.8	3.8	36.1	36.9	87.5%	
Cadmium	6010B	0.9	66.4	72.7	90.1%	
Chromium	6010B	18.9	81.6	72.7	86.2%	
Copper	6010B	27.5	89.0	72.7	84.6%	
Lead	6010B	12	262	291	85.9%	
Mercury	7471A	0.08	0.62	0.519	104%	
Nickel	6010B	17	77	72.7	82.5%	
Silver	6010B	0.4 U	61.1	72.7	84.0%	
Zinc	6010B	135	200	72.7	89.4%	

Reported in mg/kg-dry

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

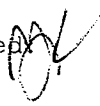
Sample ID: T607-C5-Z

SAMPLE

Lab Sample ID: MN42E

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 69.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.18	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.27	0.3	3.0	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.027	0.3	0.9	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.37	0.7	17.6	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.053	0.3	30.4	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.27	3	11	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0061	0.06	0.06	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.41	1	16	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.15	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.37	1	115	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: T607-C6-Z

SAMPLE

Lab Sample ID: MN42F

LIMS ID: 08-5463

Matrix: Sediment

Data Release Authorized

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607
15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 77.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.17	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.25	0.3	1.4	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.025	0.2	0.4	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.35	0.6	11.8	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.050	0.2	13.7	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.25	2	5	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0051	0.05	0.05	U
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.38	1	10	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.14	0.4	0.4	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.35	1	56	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

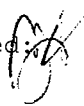
Page 1 of 1

Sample ID: T607-MD
SAMPLE

Lab Sample ID: MN42G

LIMS ID: 08-5464

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: 03/12/08

Date Received: 03/14/08

Percent Total Solids: 60.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.21	0.3	0.3	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.32	0.3	3.1	
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.031	0.3	0.8	
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.43	0.8	17.1	
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.062	0.3	37.4	
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.31	3	9	
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0070	0.07	0.08	
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.48	2	15	
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.17	0.5	0.5	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.43	2	114	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: MN42LCS

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized: 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	200.8	25.6	25.0	102%	
Arsenic	200.8	27.0	25.0	108%	
Cadmium	6010B	53.0	50.0	106%	
Chromium	6010B	51.8	50.0	104%	
Copper	6010B	52.6	50.0	105%	
Lead	6010B	205	200	102%	
Mercury	7471A	1.04	1.00	104%	
Nickel	6010B	51	50	102%	
Silver	6010B	49.8	50.0	99.6%	
Zinc	6010B	51	50	102%	

Reported in mg/kg-dry

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: MN42MB

LIMS ID: 08-5462

Matrix: Sediment

Data Release Authorized 

Reported: 03/28/08

QC Report No: MN42-Hart Crowser

Project: Port of Portland T6-Berth 607

15667-T2

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	03/18/08	200.8	03/20/08	7440-36-0	Antimony	0.13	0.2	0.2	U
3050B	03/18/08	200.8	03/20/08	7440-38-2	Arsenic	0.20	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7440-43-9	Cadmium	0.020	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7440-47-3	Chromium	0.28	0.5	0.5	U
3050B	03/18/08	6010B	03/21/08	7440-50-8	Copper	0.040	0.2	0.2	U
3050B	03/18/08	6010B	03/21/08	7439-92-1	Lead	0.20	2	2	U
CLP	03/18/08	7471A	03/21/08	7439-97-6	Mercury	0.0050	0.05	0.05	U
3050B	03/18/08	6010B	03/21/08	7440-02-0	Nickel	0.31	1	1	U
3050B	03/18/08	6010B	03/21/08	7440-22-4	Silver	0.11	0.3	0.3	U
3050B	03/18/08	6010B	03/21/08	7440-66-6	Zinc	0.28	1	1	U

Reported in mg/kg (ppm).


U-Analyte undetected at given RL

RL-Reporting Limit

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T607-C4-Z
ARI ID: 08-5461 MN42D

Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	65.70
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	67.40
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	2.98	179
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	14.5	56.8
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	1.02

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T607-C5-Z
ARI ID: 08-5462 MN42E

Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	69.40
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	67.30
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	2.66	112
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	13.5	49.7
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.796

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T607-C6-Z
ARI ID: 08-5463 MN42F


Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	80.10
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	76.00
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	2.27	25.8
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	12.7	20.3
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.941

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Client ID: T607-MD
ARI ID: 08-5464 MN42G


Analyte	Date	Method	Units	RL	Sample
Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	64.00
Preserved Total Solids	03/18/08 031808#1	EPA 160.3	Percent	0.01	63.70
N-Ammonia	03/19/08 031908#1	EPA 350.1M	mg-N/kg	3.12	120
Sulfide	03/19/08 031908#1	EPA 376.2	mg/kg	16.2	72.0
Total Organic Carbon	03/20/08 032008#1	Plumb, 1981	Percent	0.020	0.960

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

METHOD BLANK RESULTS-CONVENTIONALS
MN42-Hart Crowser




Matrix: Sediment
Data Release Authorized 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	03/18/08	Percent	< 0.01 U
	03/18/08		< 0.01 U
Preserved Total Solids	03/18/08	Percent	< 0.01 U
	03/18/08		< 0.01 U
N-Ammonia	03/19/08	mg-N/kg	< 0.10 U
	03/19/08		< 0.10 U
Sulfide	03/19/08	mg/kg	< 1.00 U
Total Organic Carbon	03/20/08	Percent	< 0.020 U

LAB CONTROL RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	03/19/08	mg/kg	6.59	6.94	95.0%
Total Organic Carbon	03/20/08	Percent	0.488	0.500	97.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
MN42-Hart Crowser




Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	03/19/08	mg-N/kg	101	100	101.0%
SPEX 28-24AS	03/19/08		100	100	100.0%
Total Organic Carbon	03/20/08	Percent	3.03	3.35	90.4%
NIST #8704					

REPLICATE RESULTS-CONVENTIONALS
MN42-Hart Crowser




Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: MN42D Client ID: T607-C4-Z					
Total Solids	03/18/08	Percent	65.70	65.30 65.50	0.3%
Preserved Total Solids	03/18/08	Percent	67.40	66.50 66.80	0.7%
N-Ammonia	03/19/08	mg-N/kg	179	182 183	1.1%
Total Organic Carbon	03/20/08	Percent	1.02	0.947 0.999	3.8%
ARI ID: MN42G Client ID: T607-MD					
Sulfide	03/19/08	mg/kg	72.0	76.1	5.5%

MS/MSD RESULTS-CONVENTIONALS
MN42-Hart Crowser



Matrix: Sediment
Data Release Authorized: 
Reported: 03/25/08

Project: Port of Portland T6-Berth 60
Event: 15667-T2
Date Sampled: 03/12/08
Date Received: 03/14/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: MN42D Client ID: T607-C4-Z						
N-Ammonia	03/19/08	mg-N/kg	179	327	150	98.7%
Total Organic Carbon	03/20/08	Percent	1.02	2.30	1.04	123.4%
ARI ID: MN42G Client ID: T607-MD						
Sulfide	03/19/08	mg/kg	72.0	241	205	82.4%

GRAINSIZE

Hart Crowser
Port of Portland T6-Berth 607 15667-T2

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
6A-T	100.0	99.6	98.1	96.7	95.7	94.4	92.2	82.3	61.7	41.3	27.3	18.8	12.5	7.9
6A-T	100.0	99.9	98.8	97.7	96.8	95.9	94.0	83.2	62.9	42.4	28.2	19.2	12.8	8.0
6A-T	100.0	100.0	99.2	98.3	97.5	96.4	94.5	84.7	65.0	44.2	29.8	20.2	13.5	8.5
T607-C4-Z	100.0	100.0	99.8	99.5	99.1	97.2	90.7	69.2	40.4	21.7	12.8	8.3	5.5	3.3
T607-C5-Z	100.0	99.8	99.4	99.0	98.4	95.6	85.5	51.2	24.7	13.4	8.1	5.5	3.7	2.1
T607-C6-Z	100.0	100.0	98.4	92.0	73.0	37.8	25.6	18.6	10.2	6.4	4.1	3.0	2.0	1.2
T607-MD	100.0	100.0	99.6	99.0	98.1	93.8	83.7	54.5	27.8	14.4	9.0	6.4	4.3	2.7

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

MN42

Hart Crowser
Port of Portland T6-Berth 607 15667-T2

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10	<4
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
6A-T	1.9	1.4	1.0	1.2	2.2	9.9	20.7	20.4	13.9	8.6	6.3	4.7	7.9	82.3
6A-T	1.2	1.1	0.9	1.0	1.9	10.8	20.3	20.5	14.2	9.0	6.3	4.9	8.0	83.2
6A-T	0.8	0.9	0.8	1.1	1.9	9.8	19.7	20.8	14.4	9.6	6.7	5.0	8.5	84.7
T607-C4-Z	0.2	0.3	0.4	1.9	6.5	21.5	28.8	18.7	8.9	4.5	2.9	2.1	3.3	69.2
T607-C5-Z	0.6	0.4	0.6	2.7	10.1	34.4	26.5	11.3	5.3	2.6	1.8	1.5	2.1	51.2
T607-C6-Z	1.6	6.4	18.9	35.3	12.2	6.9	8.4	3.8	2.3	1.1	0.9	0.9	1.2	18.6
T607-MD	0.4	0.5	0.9	4.3	10.1	29.2	26.7	13.5	5.3	2.6	2.1	1.6	2.7	54.5

Notes to the Testing

- Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

QA SUMMARY

PROJECT:	Hart Crowser	Project No.:	Port of Portland T6-Berth 607 15667-T2
ARI Triplicate Sample ID:	MM88 C	Batch No.:	MN42 -1
Client Triplicate Sample ID:	6A-T	Page:	1 of 1

Relative Standard Deviation, By Phi Size														
Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
6A-T	100.0	99.6	98.1	96.7	95.7	94.4	92.2	82.3	61.7	41.3	27.3	18.8	12.5	7.9
6A-T	100.0	99.9	98.8	97.7	96.8	95.9	94.0	83.2	62.9	42.4	28.2	19.2	12.8	8.0
6A-T	100.0	100.0	99.2	98.3	97.5	96.4	94.5	84.7	65.0	44.2	29.8	20.2	13.5	8.5
AVE	NA	99.85	98.69	97.58	96.67	95.56	93.56	83.42	63.20	42.64	28.45	19.40	12.95	8.10
STDEV	NA	0.21	0.58	0.81	0.92	1.02	1.19	1.21	1.71	1.49	1.26	0.75	0.49	0.31
%RSD	NA	0.21	0.59	0.83	0.96	1.06	1.27	1.45	2.71	3.49	4.44	3.87	3.78	3.88

The Triplicate Applies To The Following Samples						
Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105%)	Data Qualifiers	Pipette Portion (5.0-25.0g)
6A-T	3/12/2008	3/18/2008	3/22/2008	97.6		19.6
6A-T	3/12/2008	3/18/2008	3/22/2008	99.1		19.6
6A-T	3/12/2008	3/18/2008	3/22/2008	102.1		20.2
T607-C4-Z	3/12/2008	3/18/2008	3/22/2008	100.5		24.5
T607-C5-Z	3/12/2008	3/18/2008	3/22/2008	101.0		18.9
T607-C6-Z	3/12/2008	3/18/2008	3/22/2008	98.6		10.4
T607-MD	3/12/2008	3/18/2008	3/22/2008	100.7		18.1

* ARI Internal QA limits = 95-105%

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

MN42

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Warren P. Woodard
Created: 3/17/08

Worklist: 7723
Analyst: MS
Comments:

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. MN42D 08-5461 T607-C4-Z	1.10	14.52	10.08	66.9	NR
2. MN42E 08-5462 T607-C5-Z	1.12	12.36	8.80	68.3	NR
3. MN42F 08-5463 T607-C6-Z	1.12	13.08	10.34	77.1	NR
4. MN42G 08-5464 T607-MD	1.12	11.92	8.38	67.2	NR

Solids Data Entry Report
Date: 03/19/08

Checked by: H
Data Analyst: DM

Date: 3/20/08

Solids Determination performed on 03/18/08 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
MN42	D	T607-C4-Z	0.991	10.095	6.952	65.48
MN42	E	T607-C5-Z	1.048	10.598	7.701	69.66
MN42	F	T607-C6-Z	1.040	10.314	8.252	77.77
MN42	G	T607-MD	1.027	10.487	6.768	60.69

APPENDIX D
ADDITIONAL SCREENING CRITERIA TABLE

Table D-1 - Additional Screening Criteria Table
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Berth Sediment Horizon Lab ID Sample ID	601				607				Screening Levels							
	Prism	NSM			Prism	NSM			SEF		SQuiRTs		Bioaccumulation			
	MN43G T601-MD	MN43D T601-C1-Z	MN43E T601-C2-Z	MN43F T601-C3-Z	MN42G T607-MD	MN42D T607-C4-Z	MN42E T607-C5-Z	MN42F T607-C6-Z	SL1	SL2	TEL	PEL	Freshwater Fish	Individ. Bird	Individ. Mammal	General Humans
Conventional Parameters																
Total Solids (%)	63	64.4	65.1	79.9	64	65.7	69.4	80.1	-	-	-	-	-	-	-	-
Total Organic Carbon (%)	1.04	0.947	0.971	0.252	0.96	1.02	0.796	0.941	-	-	-	-	-	-	-	-
Ammonia (mg/kg)	112	137	176	12.8	120	179	112	25.8	-	-	-	-	-	-	-	-
Total Sulfides (mg/kg)	61.7	34.1	36.6	1.33 U	72	56.8	49.7	20.3	-	-	-	-	-	-	-	-
Metals in mg/kg																
Antimony	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	0.3 UJ	150 ^a	150 ^a	-	-	-	-	-	-
Arsenic	3.1	3.1	3.3	1.5	3.1	3.8	3.0	1.4	20	51	5.9	17	7	7	7	7
Cadmium	0.8	0.7	0.9	0.3 U	0.8	0.9	0.9	0.4	1.1	1.5	0.6	3.5	1	1	1	1
Chromium	18.7	18.5	17.9	15.0	17.1	18.9	17.6	11.8	95	100	37	90	-	-	-	-
Copper	24.7	25.8	21.8	10.4	37.4	27.5	30.4	13.7	80	830	36	197	-	-	-	-
Lead	10	10	12	4	9	12	11	5	340	430	35	91	17	17	17	17
Mercury	0.09	0.08	0.08	0.05 U	0.08	0.08	0.06	0.05 U	0.28	0.75	0.17	0.49	0.07	0.07	0.07	0.07
Nickel	16	16	16	13	15	17	16	10	60	70	18	36	-	-	-	-
Silver	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	2.0	2.5	-	-	-	-	-	-
Zinc	115	105	126	49	114	135	115	56	130	400	123	315	-	-	-	-
Butyltins in µg/kg																
Tributyltin (TBT) Dry Weight	2.3 J	3.6 U	3.3 J	3.6 U	160	4.5	350	5.2	75	75	-	-	2.3	1,600	730	85
SVOCs in µg/kg																
LPAHs																
Naphthalene	4.9 U	4.8 U	5 U	4.9 U	5 U	5 U	4.8 U	5 U	500	1,300	-	-	-	-	-	-
Acenaphthylene	4.9 U	4.8 U	5 U	4.9 U	5 U	5 U	4.8 U	5 U	470	640	-	-	-	-	-	-
Acenaphthene	4.9 U	4.8 U	5 U	4.9 U	100	32	32	30	1,100	1,300	-	-	-	-	-	-
Fluorene	4.9 U	4.8 U	5 U	4.9 U	95	13	34	11 J	1,000	3,000	-	-	-	-	-	-
Phenanthrene	7.4	20	29	4.9 U	270	66	330	61	6,100	7,600	42	515	-	-	-	-
Anthracene	4.9 U	4.8 U	5 U	4.9 U	50	7.9	41	5 U	1,200	1,600	-	-	-	-	-	-
2-Methylnaphthalene	4.9 U	4.8 U	5 U	4.9 U	5.9	5 U	4.8 U	5 U	470	560	-	-	-	-	-	-
Total LPAHs	7.4	20	29	4.9 U	521	119	437	102	6,600	9,200	-	-	-	-	-	-
HPAHs																
Fluoranthene	29	21	47	4.9 U	210	96	490	51	11,000	15,000	111	2,355	37,000	-	360,000	510,000
Pyrene	27	22	42	4.9 U	200	78	360	44	8,800	16,000	53	875	1,900	-	18,000,000	380,000
Benzo(a)anthracene	8.8	8.2	17	4.9 U	72	45	120	12	4,300	5,800	32	385	-	-	-	-
Chrysene	22	13	32	4.9 U	120	77	120	10	5,900	6,400	57	862	-	-	-	-
Benzo(b)fluoranthene	20	11	27	4.9 U	51	40	89	14	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	16 J	11	24	4.9 U	85	54	97	5 U	-	-	-	-	-	-	-	-
Benzo(b+k)fluoranthenes	36	22	51	4.9 U	136	94	186	14	600	4,000	-	-	-	-	-	-
Benzo(a)pyrene	9.8	9.7	23	4.9 U	60	36	81	7.5	3,300	4,800	32	782	-	-	-	-
Indeno(1,2,3-cd)pyrene	5.9	5.3	12	4.9 U	27	28	46	5 U	4,100	5,300	-	-	-	-	-	-
Dibenz(a,h)anthracene	4.9 U	4.8 U	5 U	4.9 U	7.9	5 U	13 J	5 U	800	840	-	-	-	-	-	-
Benzo(g,h,i)perylene	6.9	7.3	14	4.9 U	25	23	36	5 U	4,000	5,200	-	-	-	-	-	-
Total HPAHs	145	109	238	4.9 U	858	477	1452	139	31,000	55,000	-	-	-	-	-	-
Chlorinated Hydrocarbons																
1,4-Dichlorobenzene	7.2*/20 U	7.3*/20 U	7.3*/20 U	7.4*/20 U	7.2*/20 U	7.2*/20 U	7.3*/20 U	7.2*/20 U	35 ^a	50 ^a	-	-	-	-	-	-
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	110 ^a	110 ^a	-	-	-	-	-	-
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	31 ^a	51 ^a	-	-	-	-	-	-
Hexachlorobenzene	7.8*/20 U	8.0*/20 U	8.0*/20 U	8.0*/20 U	7.9*/20 U	7.9*/20 U	7.9*/20 U	7.9*/20 U	22 ^a	70 ^a	-	-	61,000	-	-	19
Phthalates																
Dimethyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	46	440	-	-	-	-	-	-
Diethyl Phthalate	20 U	20 U	20 U	20 U	20 U	76	20 U	20 U	200 ^a	200 ^a	-	-	-	-	-	-
Di-n-butyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	1,400 ^a	1,400 ^a	-	-	-	-	-	-
Butyl Benzyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	260	370	-	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	23	13 J	15 J	20	76	23	32	12 J	220	320	-	-	-	-	-	-
Di-n-octyl Phthalate	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	26	45	-	-	-	-	-	-
Phenols																
Phenol	29	40	40	20 U	20 U	30	20 U	20 U	420 ^a	1,200 ^a	-	-	-	-	-	-
2-Methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	63 ^a	63 ^a	-	-	-	-	-	-
4-Methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	670 ^a	670 ^a	-	-	-	-	-	-
2,4-Dimethylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	29 ^a	29 ^a	-	-	-	-	-	-
Pentachlorophenol (PCP)	98 U	100 U	100 U	100 U	98 U	98 U	99 U	98 U	400 ^a	690 ^a	-	-	310	-	330	250

Please refer to notes on the last page of this table.

Table D-1 - Additional Screening Criteria Table
Terminal 6 Sediment Characterization
N Marine Drive, Portland, Oregon

Berth Sediment Horizon Lab ID Sample ID	601				607				Screening Levels							
	Prism	NSM			Prism	NSM			SEF		SQuiRTs		Bioaccumulation			
	MN43G T601-MD	MN43D T601-C1-Z	MN43E T601-C2-Z	MN43F T601-C3-Z	MN42G T607-MD	MN42D T607-C4-Z	MN42E T607-C5-Z	MN42F T607-C6-Z	SL1	SL2	TEL	PEL	Freshwater Fish	Individ. Bird	Individ. Mammal	General Humans
SVOCs in µg/kg (Cont.)																
<i>Miscellaneous Extractables</i>																
Benzyl Alcohol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	57 ^a	73 ^a	-	-	-	-	-	-
Benzoic Acid	350	470	360	200 U	230	360	280	140 J	650 ^a	650 ^a	-	-	-	-	-	-
Dibenzofuran	0.96*/4.9 U	0.95*/4.8 U	0.97*/5.0 U	0.96*/4.9 U	37	0.97*/5.0 U	16 J	0.98*/5.0 U	400	440	-	-	-	-	-	-
Hexachlorobutadiene	7.9*/20 U	8.1*/20 U	8.1*/20 U	8.1*/20 U	7.9*/20 U	8.0*/20 U	8.0*/20 U	8.0*/20 U	11 ^a	120 ^a	-	-	-	-	-	-
n-Nitrosodiphenylamine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	28 ^a	40 ^a	-	-	-	-	-	-
Pesticides in µg/kg																
4,4'-DDE	3.3 J	3.7	2.7	1.1*/2.0 U	2.0 J	3.3	2.3	1.1*/2.0 U	9.0 ^a	9.3 ^a	1.4	6.8	-	-	-	-
4,4'-DDD	4.4 J	2.7	2.4	1.3*/2.0 U	2.5*/3.9 U	2.0 J	1.3*/2.0 U	1.2*/2.0 U	16 ^a	28 ^a	3.5	8.5	-	-	-	-
4,4'-DDT	1.7*/3.9 U	0.88*/2.0 U	0.88*/2.0 U	0.88*/2.0 U	1.7*/3.9 U	1.6 J	0.87*/2.0 U	0.87*/2.0 U	12 ^a	34 ^a	-	-	-	-	-	-
Total DDT	7.7 J	6.4	5.1	1.3*/2.0 U	2.0 J	6.9 J	2.3	1.2*/2.0 U	6.9 ^b	-	1.2 ^c	4.8 ^c	0.39	0.095 - 0.43	4.9	0.33
Aldrin	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	0.98 U	0.99 U	0.98 U	9.5 ^a	9.5 ^a	-	-	-	-	-	-
alpha-Chlordane	0.71*/2.0 U	0.36*/1.0 U	0.36*/1.0 U	0.37*/1.0 U	0.72*/2.0 U	0.36*/0.98 U	0.36*/0.99 U	0.36*/0.98 U	2.8 ^a	4.5 ^a	4.5	8.9	0.5	10	28	0.3
Dieldrin	1.6*/3.9 U	0.84*/2.0 U	0.84*/2.0 U	0.84*/2.0 U	1.6*/3.9 U	0.83*/2.0 U	0.83*/2.0 U	0.83*/2.0 U	1.9 ^a	3.5 ^a	2.9	6.7	2.2	0.37	1.2	0.0081
Heptachlor	0.79*/2.0 U	0.40*/1.0 U	0.40*/1.0 U	0.40*/1.0 U	0.79*/2.0 U	0.40*/0.98 U	0.40*/0.99 U	0.40*/0.98 U	1.5 ^a	2.0 ^a	0.6	2.7	-	-	-	-
gamma-BHC (Lindane)	0.96*/2.0 U	0.49*/1.0 U	0.49*/1.0 U	0.49*/1.0 U	0.96*/2.0 U	0.48*/0.98 U	0.49*/0.99 U	0.48*/0.98 U	10 ^b	-	0.9	1.4	-	-	-	-
PCBs in µg/kg																
Aroclor 1016	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1221	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1232	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1242	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1248	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1254	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/9.9 U	3.3*/9.8 U	-	-	-	-	-	-	-	-
Aroclor 1260	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/15 Y	3.3*/9.8 U	-	-	-	-	-	-	-	-
Total PCBs	3.2*/9.8 U	3.3*/10 U	3.3*/10 U	3.3*/10 U	3.2*/9.8 U	3.3*/9.8 U	3.3*/15 Y	3.3*/9.8 U	60	120	34.1	277	22	1.8 - 57	44	0.39

Notes:

- PAH concentrations are the higher of the detected concentrations (not estimated) of the EPA Method 8270D-SIM and EPA Method 8270D analyses.
- Screening levels (SLs) are as follows:
SEF = Freshwater SLs (Corps, et al., 2006; Table 7-1, revised 10/20/06). If a freshwater value was not present, marine SLs marine SLs from the same table are listed and flagged with an ^a. Gamma-BHC and Total DDT do not have a SEF SL; the values are flagged with a ^b and are from Table 8-1 of the Dredge Material Evaluation Framework (Corps, et al., 1998).
SQuiRTs = Screening Quick Reference Tables from Buchman (1999), except as modified by DEQ (2006) and flagged with a ^c.
Bioaccumulation = Values from DEQ bioaccumulation guidance document (DEQ, 2007).
- Bolded values are detected concentrations.
- Shaded values are either:
- A sediment concentration exceeding its respective SEF SL1; or
- A screening level that was exceeded by a detection of the compound in a sediment sample.
- Underlined screening level is below method detection limit.
- For undetected compounds, method reporting limits are shown unless otherwise indicated.
- *Method detection limit (MDL).
- = Not available.
- NSM = New surface material (i.e., leave surface).
- J = Estimated concentration between MDL and method reporting limit (MRL).
- U = Not detected at the indicated MDL or MRL.
- UJ = Estimated MRL (see Appendix B).
- Y = Not detected at a MRL that was raised due to chromatographic interference.

References:

Buchman, M.F., 1999. NOAA Screening Quick Reference Tables, HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division National Oceanic and Atmospheric Administration. 12 pp.

DEQ, 2006. Evaluation of Reliability of Potential Freshwater Sediment Screening Values. December 6, 2007.

DEQ, 2007. Guidance for Assessing Bioaccumulation Chemicals of Concern in Sediment. Updated April 2, 2007.

U.S. Army Corps of Engineers, Portland District and Seattle District; U.S. EPA, Region 10; Oregon Department of Environmental Quality; Washington State Department of Natural Resource and Department of Ecology, 1998. Dred Material Evaluation Framework for the Lower Columbia River Management Area. November 1998.