

March 22, 2019

Jeff K. Schatz, R.G.
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232

**Subject: Response to Comments and Final Interim Document
Contaminated Media Management Plan, Terminal 4 Slip 1 and Slip 3
ECSE Nos. 2356 and 272**

Dear Jeff:

This letter provides the Oregon Department of Environmental Quality (DEQ) with a response to comments received on the *Contaminated Media Management Plan, Terminal 4 Slip 1 and Slip 3* dated April 6, 2018. The comments were provided to the Port of Portland (Port) in a letter dated February 20, 2019. Enclosed with this letter is the redline/strikeout version of the Final *Interim Contaminated Media Management Plan* incorporating the comment-responses. The Port requests DEQ provide written confirmation the Final *Interim Contaminated Media Management Plan* enclosed is approved based on the comment-responses and final revisions. Once DEQ confirmation is received, the Port will prepare final hard copies for submittal.

The DEQ comments are repeated (in italics) followed by the Port of Portland response.

1. *DEQ expects that a final CMMP will be developed upon completion of the upland and riverbank remedies (e.g., the latter to be completed concurrent with the in-water cleanup). If significant time elapses between phases of the remedy and portions of this CMMP are rendered obsolete, the interim CMMP should be updated to reflect the most current conditions. As an example, DEQ understands that options for repairing erosion damage to the Wheeler Bay bank are being evaluated and the configuration of selected areas of the bank may change in coming years. When construction is completed, the CMMP should be updated with a revised Appendix E that includes any EPA or other permitting agency monitoring requirements or controls.*

Response: The Contaminated Media Management Plan (CMMP) will be updated as phases of upland and riverbank work are completed. The document will continue to be called interim until all aspects of the remedy have been completed.

2. *With issuance of the Portland Harbor ROD in 2017, the Portland Harbor riverbank/sediment "screening levels" referenced in the CMMP were established as cleanup levels (CULs). In addition, Portland Harbor Principal Threat Waste and Remedial Action Levels (RALs) should be considered when screening concentrations of COCs in the riverbanks. In light of the fact that Portland Harbor CULs and RALs may change when EPA finalizes an Explanation of Significant Difference, DEQ is not requiring a revision to the CMMP to reflect this comment at this time.*

Response: Portland Harbor cleanup levels, remedial action levels, and principal threat waste thresholds will be included in the CMMP during the next revision after the EPA finalizes the Explanation of Significant Difference.

3. *The CMMP indicates that soil exceeding Portland Harbor riverbank/sediment CULs may not be placed within 50 feet of a riverbank of storm drain. DEQ believes this requirement should be expanded to indicate that soil exceeding Portland Harbor riverbank/sediment CULs should not be placed in any location where there is a complete pathway to the riverbank or sediment.*

Response: Language was added in Section 4.1 of the CMMP indicating that soil exceeding Portland Harbor riverbank/sediment CULs should not be placed in any location where there is a complete pathway to the riverbank or sediment. Soil placed greater than 50 feet from the riverbank or a storm drain and stabilized in accordance with standard sediment control practices (e.g., through grading, vegetation, or covering with gravel/pavement) shall be presumed to meet this requirement.

4. *DEQ understands that a high level of operational activity (especially in Slip 3), measures required under federal marine security regulations, and Port standard operating procedures are considered to be effective controls that limit access to active slips, banks and beach areas at Terminal 4. However, the effectiveness of such measures in preventing recreational and sustenance fishers from contacting river banks, beaches and contaminated sediment has not been evaluated, to DEQ's knowledge. DEQ suggests that the Port may want to consider making regular observations of bank areas, especially during low water conditions, for evidence of human activity as a means of demonstrating the effectiveness of such controls.*

Response: The CMMP's primary focus is on procedures (e.g., engineering controls) for appropriate management of soil or groundwater in upland areas where chemicals may be present at concentrations above human health risk-based screening levels for commercial/industrial use. It also covers riverbanks which are part of the in-water remedy for the Portland Harbor Superfund site. The Port is currently implementing administrative or institutional controls for the Wheeler Bank riverbank area which is designated as a regulated navigation area. Other riverbank areas and submerged sediments in the slips and Wheeler Bay will be part of the in-water remedy work where future administrative or institutional controls will be considered and future revisions to the CMMP will likely be needed. There are no recreational beaches at Terminal 4.

5. *Because remedial actions in the South Slip 3 Bank and Riverbank areas will be rolled into the in-water cleanup (i.e., for which EPA is the lead agency), DEQ recommends that the Port consult with EPA regarding specific requirements for administrative or institutional controls to limit the potential for human receptors to contact contaminated bank soil and sediment or to ingest fish containing elevated levels of Contaminants of Concern.*

Response: The Port will consult with EPA as necessary to include administrative or institutional requirements of the in-water remediation.

Please call me at (503) 415-6676 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Kelly Madalinski". The signature is fluid and cursive, with the first name "Kelly" and last name "Madalinski" clearly distinguishable.

Kelly Madalinski
Environmental Program Manager

c: Eva DeMaria, EPA
 Josie Clark, EPA
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 LWP File



***Final Interim Contaminated Media
Management Plan
Terminal 4 Slip 1 and Slip 3
Upland Facilities
Portland, Oregon***

**Prepared for:
Port of Portland**

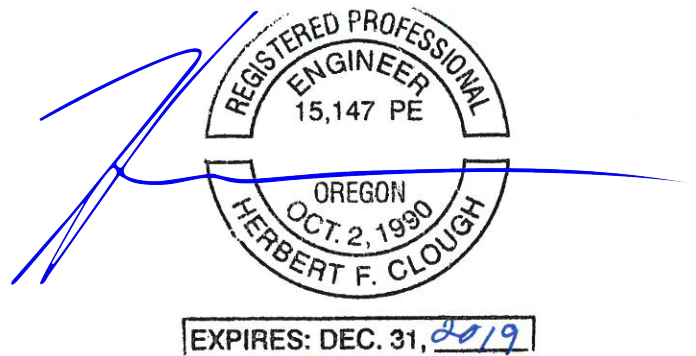
**March 22, 2019
1007-21/1066-10**



***Final Interim Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3
Upland Facilities
Portland, Oregon***

Prepared for:
Port of Portland

March 22, 2019
1007-21/1064-10



Herb Clough, P.E.
Principal

Table of Contents

1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Limitations	1
1.3 CMMP Use and Organization	2
2.0 BACKGROUND	2
2.1 Terminal 4 Location and History	2
2.2 Geology and Hydrogeology	3
2.3 Regulatory Framework	3
2.4 Management Areas	7
3.0 HEALTH AND SAFETY PLANNING	8
4.0 CONTAMINATED MEDIA MANAGEMENT	8
4.1 Handling and Final Disposition of Soil	8
4.2 Handling and Final Disposition of Groundwater	10
4.3 Unanticipated Contamination	11
4.4 Characterization of Soil or Groundwater	11
5.0 NOTIFICATION, APPROVALS, AND REPORTING	13
5.1 Notification and Approvals	13
5.2 Reporting	13
6.0 REFERENCES	15

Tables

1	Risk-Based Screening Levels and Hot Spot Levels
2	Clean Fill Screening Criteria

Figures

1	Facility Location Map
2	Vicinity Plan and Management Areas
3	Monitoring Well Locations

Appendices

A	Pier 1 Unpaved Area
B	Pier 1 Rail Area
C	Former Grain Tanks Area
D	Cesspool Area

Appendices (continued)

E	Wheeler Bay Bank
F	Former Pipeline Release Area
G	Riverbank Area
H	Former Quaker State Area
I	South Slip 3 Area
J	Groundwater Area

1.0 Introduction

This Final Interim Contaminated Media Management Plan (CMMP) was prepared for use at the Port of Portland's (Port's) Terminal 4 (see Figure 1). This CMMP identifies engineering and other controls to manage potential risk associated with chemicals that may be encountered in soil or groundwater at specific locations on Terminal 4.

This CMMP is considered interim as all aspects of remediation for management areas identified in this document have not been completed. This document will be updated when needed as soil or groundwater remediation at specific locations are completed. The management procedures identified in this CMMP are not anticipated to be changed with future updates, unless new information warrants re-consideration. The document will continue to be interim until all phases of remediation at Terminal 4 are complete.

1.1 Purpose

The purpose of this CMMP is to coordinate construction projects or site development with the environmental requirements at Terminal 4. It identifies procedures for appropriate management of soil or groundwater in areas where chemicals may be present at concentrations above human health risk-based screening levels for commercial/industrial site use (Screening Levels).

The CMMP provides the following:

- Limitations and instructions for use of this CMMP;
- Background information on Terminal 4 and the locations where this CMMP is applicable;
- Information needed to make informed decisions regarding the health and safety of workers; and
- Information needed to properly handle soil or groundwater during construction projects or site development at applicable locations at Terminal 4.

1.2 Limitations

This CMMP addresses the proper handling of soil or groundwater within the identified Management Areas at Terminal 4 (see Figure 2). The CMMP provides the data needed to make informed decisions regarding worker safety, but it *does not* provide specific health and safety recommendations for the protection of site workers or construction personnel. Parties involved in construction activities or site operations that could result in exposure to applicable soil or groundwater should be familiar with the content of this CMMP but should have a Health and Safety Plan prepared specific to the work. This CMMP is also based on conditions as known at the time of this document preparation and unanticipated conditions may be encountered at Terminal 4 that are not explicitly covered in this CMMP.

This CMMP does not identify other environmental laws and regulations that may be also applicable to the construction activities or site operations at Terminal 4.

1.3 CMMP Use and Organization

This CMMP should be incorporated into all planning, design, and contract documents where construction activities occur in the Management Areas identified in Figure 2. It should be followed by any party (the Port, tenants, contractors, etc.) involved in construction activities or site operations at Terminal 4 as it relates to health and safety planning and managing soil or groundwater in the identified Management Areas.

Section 2 provides a brief summary of the background and the environmental concerns that exist at Terminal 4. Section 3 addresses health and safety considerations as they relate to the environmental concerns. Section 4 presents the general procedures and management components for handling soil or groundwater in the Management Areas. Section 5 identifies the reporting required. Appendices A through J provide information specific to each Management Area identified on Figure 2, including information to assist in the development of a health and safety plan.

All parties should become familiar with the background information in Section 2, health and safety considerations in Section 3, and general requirements described in Section 4. Parties should then identify the Management Area(s) where activities will be conducted and follow the requirements provided in the corresponding appendix (Appendices A through J).

2.0 Background

2.1 Terminal 4 Location and History

Terminal 4 covers approximately 283 acres in the St. Johns area of North Portland at 11040 N. Lombard Street. The location and vicinity of Terminal 4 are shown on Figure 1. Terminal 4 is located in the Portland Harbor area of the Willamette River, on the east bank between River Miles 4.2 and 5.5. The land is zoned for industrial use (IH). The areas surrounding Terminal 4 are occupied by marine, industrial, and commercial operations. A small residential zone (four tax lots) is located about 200 feet east of the terminal. Larger residential zones are located 2,000 feet east and 1,000 feet southeast of the terminal.

The topography of Terminal 4 is relatively flat, with the majority of the terminal at an elevation of approximately 35 feet (NAVD88 datum). The east portion of the terminal near Lombard Street is at an elevation of approximately 100 feet. The river water elevation is typically less than 10 feet and is subject to a mean tidal range of about 2 feet. The ground surface of the terminal consists mainly of asphalt or concrete, with areas

of gravel and grass interspersed. Three inlets from the Willamette River are present in the northern portion of Terminal 4: Slip 1 to the north, Slip 3 to the south, and a smaller bay between the two slips informally referred to as Wheeler Bay (see Figure 2).

Terminal 4 was divided into three areas for the purposes of oversight of investigation and/or cleanup of the terminal by the Oregon Department of Environmental Quality (DEQ). The three areas cover most of the terminal and are designated as Terminal 4 Slip 1 (ECSI¹ No. 2356), Terminal 4 Slip 3 (ECSI No. 272), and Terminal 4 Auto Storage Area (ECSI No. 172). These areas encompass 98 acres, 27 acres, and 125 acres, respectively (see also Section 2.3). The approximate boundaries of these regulatory areas are shown on Figure 2.

2.2 Geology and Hydrogeology

Soil Conditions. Terminal 4 is underlain by approximately 10 to 30 feet of sandy fill. The sandy fill is fine- to medium-grained sand with some coarse sand and fine gravel and relatively little silt (Hart Crowser, 2000). The sandy fill is underlain by alluvium (soils deposited by river action). A laterally continuous layer of silt makes up the top of the alluvium. The silt varies in thickness from approximately 2 feet to more than 5 feet. This silt layer appears to be hummocky with a general slope towards the river. Below the silt layer, the alluvium is comprised of layers of silt, sandy silt, silty sand, and sand, which do not appear to be laterally continuous.

Hydrogeology. Water levels in monitoring wells at Terminal 4 have been monitored for a period of approximately 20 years (Apex, 2016; Ash Creek/Newfields, 2007b). Figure 3 shows the locations of monitoring wells at Terminal 4. The water level data indicate that the depth to groundwater generally ranges from 12 to 23 feet below ground surface (bgs) with tidal and seasonal fluctuations. The groundwater gradient² is generally toward the river, but locally gradients are variable depending on factors such as river levels, tidal action, and soil layering.

2.3 Regulatory Framework

Investigation and cleanup of Terminal 4 are being conducted under specific regulations that define under what conditions cleanup is required and what cleanup actions are acceptable.³ The following sections describe the specific regulatory framework governing the work at Terminal 4.

¹ ECSI stands for “Environmental Cleanup Site Information” and is a database maintained by the DEQ for sites that have been identified as potentially having historical releases of chemicals that warrant further investigation and possibly cleanup. DEQ maintains files on each of these sites and summary information and some documents may be obtained from DEQ’s website.

² The groundwater gradient is a measure of the slope of the water surface, indicating the direction that groundwater moves.

³ The applicable rules governing the cleanup of Terminal 4 under DEQ oversight are Oregon Administrative Rules 340-122.

2.3.1 Terminal 4 Slip 1

The Port entered into a Voluntary Cleanup Program Agreement for Remedial Investigation⁴, Source Control Measures⁵, and Feasibility Study⁶ (Voluntary Agreement) with the DEQ on December 4, 2003. The Voluntary Agreement applies to the portion of Terminal 4 defined for the purpose of the Voluntary Agreement as Terminal 4 Slip 1, and the approximate boundary of the applicable area is shown on Figure 2.

The Port completed various investigations, evaluations, and actions required by the Voluntary Agreement. The following milestone documents have been completed to date:

- Remedial Investigation (Ash Creek/Newfields, 2007c);
- Source Control Alternatives Evaluation⁷ (Ash Creek/Newfields, 2007a);
- Stormwater Source Control Evaluation (Ash Creek, 2009a);
- Wheeler Bay source control action (Ash Creek, 2009b);
- Partial Well Abandonment (Ash Creek, 2006);
- Feasibility Study (Ash Creek, 2011).

The feasibility study concluded that certain actions were needed to address soil in several areas of Terminal 4 where the concentrations of chemicals are above levels defined by environmental regulations. In summary, the recommended final remedy in the DEQ-approved feasibility study for the Slip 1 area included the following:

- Limit site access;
- Prepare and implement a soil management plan; and
- Use future development to remove or cap soil with chemicals above Screening Levels.

This CMMP fulfills the requirement for a soil management plan as defined in the feasibility study. Because a final Record of Decision has not been published for Slip 1, this CMMP is an interim remedial measure with respect to the Terminal 4 Slip 1 facility. The format of the CMMP may be revised based on the final remedy selection process.

⁴ A Remedial Investigation is defined by environmental regulations and generally consists of collecting data and evaluating the extent and severity of contamination of soil and groundwater.

⁵ Source Control Measures in this context are actions necessary to prevent future contamination of the Willamette River water or sediments.

⁶ A Feasibility Study is an engineering evaluation of a range of methods to clean up contaminated soil and/or groundwater. The study provides the information needed for the regulatory agency to select the final cleanup remedy.

⁷ A Source Control Alternatives Evaluation is similar to a Feasibility Study but applies to the process of selecting a Source Control Measure.

2.3.2 Terminal 4 Slip 3

The Port entered into a Voluntary Cleanup Program Agreement for Feasibility Study and Source Control Measures (VCP Agreement) with the DEQ on June 27, 2002. The VCP Agreement applied to the portion of Terminal 4 defined for the purpose of the VCP Agreement as Terminal 4 Slip 3, and the approximate boundary of the applicable area is shown on Figure 2.

The Port completed various evaluations and actions required by the VCP Agreement, and the DEQ prepared a Record of Decision.⁸ The following milestone documents have been completed to date:

- Remedial Investigation (Hart Crowser, 2000);
- Feasibility Study (Hart Crowser, 2002);
- Source Control at Slip 3 (Anchor, 2009; BBL/Ash Creek/Newfields, 2005);
- Stormwater Source Control Evaluation (Ash Creek, 2009a);
- Pencil Pitch Investigations (Ash Creek/Newfields, 2007b; Ash Creek, 2008)
- Source Control and Hot Spot Removal (Ash Creek, 2010);
- Record of Decision (DEQ, 2003); and
- Explanation of Significant Difference⁹ (DEQ, 2004).
- Partial Well Abandonment (Apex, 2015).
- Groundwater Monitoring (Apex, 2016; Apex, 2017)

The final selected remedy, as defined by the Record of Decision and Explanation of Significant Difference, consists of the following:

- Removal and off-site disposal of soil from the riverbank at the head of Slip 3;
- Amend the fill used to replace the soil removed at the head of Slip 3 to prevent petroleum hydrocarbons in groundwater from migrating to the surface water in Slip 3;
- Hand bail liquid petroleum hydrocarbons floating on groundwater in monitoring wells;
- Removal and off-site disposal of shallow soil in selected areas;
- Monitor groundwater levels and concentrations of petroleum hydrocarbons; and
- Implement controls that restrict use of groundwater, identify areas at Terminal 4 where soil or groundwater contains petroleum hydrocarbons, and define how soil and groundwater that contain petroleum hydrocarbons should be managed.

⁸ A Record of Decision is a document prepared by the regulatory agency that defines the final remedy for cleanup of a contaminated site.

⁹ If a final remedy is revised after the Record of Decision is issued, the regulatory agency is required to issue an Explanation of Significant Difference that presents the revised remedy and the justification for the changes.

On October 7, 2004, a Consent Judgment between the DEQ and Port was filed in the Circuit Court of Oregon for Multnomah County. The Consent Judgment required the Port to perform several actions, including, specifically, preparation of a CMMP for the applicable portion of Terminal 4.

This CMMP fulfills the requirement for a soil and groundwater management plan as defined in the Record of Decision and Consent Judgment, Attachment C – Statement of Work, Section J.

2.3.3 Terminal 4 Auto Storage Area

The Terminal 4 Auto Storage Area includes two primary parcels (see Figure 2). The upper parcel covers approximately 36 acres on the east side of Terminal 4 located between the Union Pacific Railroad and N. Lombard Street. The lower parcel covers approximately 89 acres on the south end of Terminal 4.

The upper parcel had impacts to soil and groundwater from leaking underground storage tanks (LUSTs) associated with Toyota's lease of the parcel. Cleanup of soil and groundwater was completed and the DEQ issued a letter indicating no further action was necessary for the upper parcel (letter dated September 17, 2003; DEQ file number LUST #26-91-0133).¹⁰

No releases were known for the lower parcel of the Terminal 4 Auto Storage Area. During the early stages of the Portland Harbor Superfund Site investigation, the Environmental Protection Agency (EPA) requested information from property owners along the Willamette River, including the Port. In agreements between the DEQ and the EPA, the DEQ was tasked with reviewing information on upland areas adjacent to the river to evaluate if further investigation or remediation (i.e., source control) would be necessary. The DEQ reviewed documents submitted by the Port for the lower parcel (including a Preliminary Assessment prepared by the Port and three investigation reports prepared by consultants to the Port to support development of the property). Following their document review, the DEQ issued a letter stating that no further action was necessary for the lower parcel (letter dated June 11, 2004; DEQ ECSI No. 172).

Based on the letters stating that no further action is necessary at the Terminal 4 Auto Storage Area, a CMMP is not necessary for the parcels of this area.

2.3.4 Coordination with Portland Harbor Superfund Cleanup

The cleanup for the Terminal 4 riverbanks is currently planned to be conducted as part of the in-water Superfund cleanup for Portland Harbor and will be overseen by the EPA. Specific material management

¹⁰ Residual diesel-range petroleum hydrocarbons were detected in post-remediation soil sampling, primarily at depths of greater than 40 feet, but also at depths as shallow as 5 feet. Risks are acceptable, but residual petroleum hydrocarbons may be present in soil west of the building on the upper parcel.

requirements will be a part of that cleanup. This CMMP will be updated, as necessary, to incorporate requirements from the Superfund remedy once that remedy has been implemented for the Terminal 4 riverbanks.

2.3.5 Plan Compliance

As part of the implementation of this CMMP, the Port is required to provide mechanisms to enforce compliance. Compliance will be achieved as follows: (1) The Port will notify all relevant employees and managers of the existence of this CMMP and ensure that Port-directed activities subject to the CMMP remain in compliance with its terms. (2) The Port's internal stakeholder review process, called a Business Analysis Terms Sheet (BATS), will be used to ensure that the CMMP is accounted for. BATS requires solicitation of input from various departments within the Port, including environmental, and provides the opportunity for environmental reviews which would ensure CMMP implementation should work be conducted in the Management Areas. (3) The Port will ensure that any contract issued to any third party that might entail activity at T4 will include reference to the CMMP and enforceable terms requiring compliance with the CMMP, as appropriate. These contracts will include construction-related contracts as well as leases, rights of entry, and other real estate-related agreements.

2.4 Management Areas

This CMMP only applies to specific areas on Terminal 4 where chemicals may be present in soil or groundwater above Screening Levels. These areas, defined as Management Areas, are listed below and generally shown on Figure 2. Detailed information is provided in Appendices A through J for each Management Area.

- Terminal 4 Slip 1 (ECSI No. 2356)
 - Pier 1 Unpaved Area;
 - Pier 1 Rail Area;
 - Former Grain Tanks Area;
 - Cesspool Area;
 - Wheeler Bay Bank;
- Terminal 4 Slip 3 (ECSI No. 272)
 - Former Pipeline Release Area;
 - Riverbank Area;
 - Former Quaker State Area;
 - South Slip 3 Area;
 - Groundwater Area.

3.0 Health And Safety Planning

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within the Management Areas at Terminal 4 must comply with the following requirements.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law, and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables from soil and groundwater investigations at Terminal 4 are reproduced in Appendices A through J, and provide guidelines for the magnitudes of chemicals encountered in the Management Areas at Terminal 4.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

4.0 Contaminated Media Management

This section defines the procedures for characterizing or handling soil and/or groundwater in any Management Area.

4.1 Handling and Final Disposition of Soil

This section discusses the general requirements for handling/disposition of soil. Site-specific information for each Management Area is provided in Appendices A through I. Until demonstrated otherwise (such as through characterization as described in Section 4.4), soil from the Management Areas identified on Figure 2 shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled

(including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents¹¹ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section 3).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or be properly disposed of off Port property. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project, restrictions imposed on that Management Area (e.g., bank stabilization requirements), and there are no indicators of unexpected contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain in any location where there is a complete pathway to the riverbank or river. Soil placed greater than 50 feet from the riverbank or a storm drain and stabilized in accordance with the contract documents shall be presumed to meet this requirement.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations (RBCs) for construction workers and occupational use – see Table 1¹² – and the soil is ~~not subject to erosion. Areas where the soil would be subject~~

¹¹ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

¹² The chemicals listed in Table 1 are those most likely to be present and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

~~to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank located and stabilized where there is not a complete pathway to the riverbank or river. Soil placed greater than 50 feet from the riverbank or a storm drain and stabilized in accordance with the contract documents shall be presumed to meet this requirement.~~

- If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1), soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil ~~may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank must be located and stabilized where there is not a complete pathway to the riverbank or river. Soil placed greater than 50 feet from the riverbank or a storm drain and stabilized in accordance with the contract documents shall be presumed to meet this requirement.~~
- The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.¹³
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this CMMP (Appendices A through I) or new data collected in accordance with Section 4.4. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

4.2 Handling and Final Disposition of Groundwater

This section discusses the general requirements for handling/disposition of groundwater. Site-specific information for the Groundwater Management Area is provided in Appendix J. Until demonstrated otherwise (such as through characterization as described in Section 4.4), groundwater from the Groundwater Management Area identified on Figure 2 shall be presumed to contain chemicals above discharge limitations

¹³ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

for surface water, sanitary sewer, or the ground surface. Groundwater shall be handled in accordance with the project contract documents to prevent worker exposure and prevent the spread of chemicals. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section 3).
- Implement best management practices in the contract documents.

To the extent that the Port (or one of its tenants) uses groundwater at Terminal 4 for any purpose, the Port and/or tenant shall do so in a manner that does not contribute to or exacerbate any pre-existing condition at Terminal 4 with regards to the magnitude or extent of the chemicals in groundwater. In addition, groundwater in the Groundwater Management Area shall not be used for any purpose unless such use can be shown to result in acceptable risk. Existing data may be used for that evaluation, but because of potential lateral variability and degradation of petroleum hydrocarbons, sampling of groundwater in the area of planned activities may be warranted.

4.3 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated¹⁴ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated materials, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

4.4 Characterization of Soil or Groundwater

In general, it is expected that soil or groundwater within the Management Areas will be characterized using the existing data in this CMMP. In the event that additional sampling is needed or desired, the party implementing an activity within a Management Area shall characterize the soil or groundwater (as applicable) using either or both of the following methods below. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.¹⁵ Soil and

¹⁴ Contaminated material is material that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or material designated by the Port as contaminated.

¹⁵ Generally, the needs of the project dictate the method selected. Considering soil, for example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach. Considering groundwater for example, for small volumes of groundwater (e.g., one or two drums), the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and the volume is small, sampling after removal may be suitable. If dewatering may continue for a long period, sampling prior to removal is the best approach.

groundwater characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil or groundwater in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for the chemicals previously detected in that Management Area (see data screening in Appendices A through J).

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Groundwater samples may be collected from existing monitoring wells, newly installed monitoring wells, or grab samples from temporary borings.

Method B – Characterization After Removal

The concentrations of chemicals in soil or groundwater are variable within a Management Area. The implementing party may choose to wait until the soil or groundwater is removed to characterize the material for final disposition. In that event, the soil or groundwater must be properly stored until characterized.¹⁶ Samples should be collected from the stored materials and analyzed for the chemicals previously identified to be above Screening Levels in that Management Area (see data screening in Appendices A through J).

¹⁶ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

Soil should be stored in a stockpile or drop box and managed in accordance with Section 4.1. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

Groundwater should be stored in drums or tanks and managed in accordance with Section 4.2. Collect one sample from each container for chemical analysis.

5.0 Notification, Approvals, and Reporting

5.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, the DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. The DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

5.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers

relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution;
- If the work is conducted within the groundwater management area, a site plan that shows sample locations, dewatering wells, treatment system, and discharge point; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ ECSI number as follows:

- ECSI No. 2356 – Pier 1 Unpaved Area, Pier 1 Rail Area, Former Grain Tanks Area, Cesspool Area, and the Wheeler Bank.
- ECSI No. 272 – Former Pipeline Release Area, River Bank Area, Former Quaker State Area, South Slip 3 Area, and Groundwater Area.

The report will be maintained in the Port files for the respective Upland Facility. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

6.0 References

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Hart Crowser, 2002. *Feasibility Study Report*, Terminal 4, Slip 3 Upland, Portland, Oregon. July 5, 2002.

Table 1
Risk-Based Screening Levels and Hot Spot Levels
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Risk-Based Concentrations ¹			Hot Spot Levels
	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
TPH				
Gasoline	20,000	9,700		97,000
Diesel/Heating Oil	14,000	4,600	91	46,000
Metals				
Arsenic	1.9	15	3	190
Barium	220,000	69,000		690,000
Beryllium	2,300	700		70,000
Cadmium	1,100	350	0.51	35,000
Chromium	>Max	530,000		5,300,000
Copper	47,000	14,000	359	140,000
Lead	800	800	196	8,000
Mercury	350	110	0.085	1,100
Nickel	22,000	7,000		700,000
Silver	5,800	1,800		18,000
Zinc	--	--	459	--
VOCs				
Benzene	37	380		3,700
Bromodichloromethane	15	230		1,500
Bromoform	260	2,700		26,000
Bromomethane	750	370		3,700
Carbon Tetrachloride	34	320		3,400
Chlorobenzene	8,700	4,700		47,000
Chloroethane	>Max	>Max		> Max
Chloroform	26	410		2,600
Chloromethane	25,000	25,000		250,000
Dibromochloromethane	17	210		1,700
1,2-Dibromoethane (EDB)	1	9		73
1,2-Dichlorobenzene	36,000	20,000		200,000
1,4-Dichlorobenzene	64	1,300		6,400
1,1-Dichloroethane	260	3,200		26,000
1,2-Dichloroethane (EDC)	16	200		1,600
1,1-Dichloroethene	29,000	13,000		130,000
cis-1,2-Dichloroethene	2,300	710		7,100
trans-1,2-Dichloroethene	23,000	7,100		71,000
Ethylbenzene	150	1,700		15,000
Isopropylbenzene	57,000	27,000		270,000
Methyl tert-butyl ether (MTBE)	1,100	12,000		110,000
VOCs (continued)				
Methylene Chloride	1,600	2,100		160,000
Styrene	130,000	56,000		560,000
Tetrachloroethene (PCE)	1,000	1,800		100,000
Toluene	88,000	28,000		280,000
1,1,1-Trichloroethane	870,000	470,000		47,000,000
1,1,2-Trichloroethane	26	54		2,600
Trichloroethene (TCE)	51	470		5,100
Trichlorofluoromethane	130,000	69,000		690,000
1,2,4-Trimethylbenzene	2,000	2,000		20,000
1,3,5-Trimethylbenzene	12,000	3,500		35,000
Vinyl chloride	4	34		400
Xylene (mixed)	25,000	20,000		200,000
PAHs				
Acenaphthene	70,000	21,000		210,000
Anthracene	350,000	110,000		1,100,000
Benzo(a)anthracene	2.9	24		290
Benzo(a)pyrene	0.29	2.4		29
Benzo(b)fluoranthene	2.9	24		290

Please see notes at end of table.

Table 1
Risk-Based Screening Levels and Hot Spot Levels
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Risk-Based Concentrations ¹			Hot Spot Levels
	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
	Concentrations in milligrams per kilogram (mg/kg)			
PAHs				
Benzo(k)fluoranthene	29	240		2,900
Chrysene	290	2400		29,000
Dibenz(a,h)anthracene	0.29	2.4		29
Fluoranthene	30,000	10,000		100,000
Fluorene	47,000	14,000		140,000
Indeno(1,2,3-cd)pyrene	2.9	24		290
Naphthalene	23	580		2,300
Pyrene	23,000	7,500		75,000
Total PAHs	--	--	23	--
cPAHs (BaP Eq)	--	--	0.012	--
SVOCs				
Bis(2-ethylhexyl) Phthalate	160	1,300	0.135	16,000
1,2-Dichlorobenzene	36,000	20,000		200,000
1,4-Dichlorobenzene	64	1,300		6,400
2,6-Dinitrotoluene	1.5	13		15
Hexachlorobenzene	0.93	11		93
Hexachloroethane	32	180		3,200
N-Nitroso-di-n-propylamine	0.33	2.7		33
N-Nitrosodiphenylamine	470	3,800		47,000
2,4,6-Trichlorophenol	210	270		21,000
Chlorinated Pesticides				
Aldrin	0.13	1.1	0.002	13
alpha-Chlordane	7.4	61	0.0014	740
gamma-Chlordane	7.4	61	0.0014	740
Dieldrin	0.14	1.2	0.00007	14
4,4'-DDD	12	94	0.114	1,200
4,4'-DDE	8.2	66	0.226	820
4,4'-DDT	8.5	66	0.246	850
DDx	--	--	0.0061	--
Endosulfan I	4,900	1,600		16,000
Endrin	250	80		800
Heptachlor	0.45	4		45
Heptachlor Epoxide	0.24	2		24
Hexachlorocyclohexane, alpha	0.36	3		36
Hexachlorocyclohexane, gamma	2.1	17	0.005	210
MCPA	410	130		1,300
Toxaphene	2.1	17		210
PCBs				
Total PCBs	0.59	4.9	0.009	59

Note:

1. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).

Table 2
Clean Fill Screening Criteria
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Clean Fill Concentrations ¹
	<i>Concentrations in milligrams per kilogram (mg/kg)</i>
Metals	
Antimony	0.56
Arsenic	8.8
Beryllium	21
Cadmium	0.63
Chromium	76
Copper	34
Lead	28
Mercury	0.23
Nickel	47
Selenium	0.71
Silver	4
Zinc	180
VOCs	
Acetone	59.52
Benzene	0.0093
Bromobenzene	4.068
Bromochloromethane	0.936
Bromodichloromethane	0.0025
Bromoform	0.084
Bromomethane	0.098
2-Butanone (MEK)	27.48
Carbon Tetrachloride	0.028
Carbon Disulfide	11.64
Chlorobenzene	6.5
Chloroethane	320
Chloroform	0.0033
Chloromethane	2.2
2-Chlorotoluene	21.66
4-Chlorotoluene	22.5
Dibromochloromethane	0.0033
1,2-Dibromoethane (EDB)	0.00081
Dibromomethane	0.0876
1,2-Dichlorobenzene	70
1,4-Dichlorobenzene	0.081
Dichlorodifluoromethane	94
1,1-Dichloroethane	0.037

Please see notes at end of table.

Table 2
Clean Fill Screening Criteria
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Clean Fill Concentrations ¹
	<i>Concentrations in milligrams per kilogram (mg/kg)</i>
VOCs	
1,2-Dichloroethane (EDC)	0.0014
1,1-Dichloroethene	11
cis-1,2-Dichloroethene	1.2
trans-1,2-Dichloroethene	2.5
Ethylbenzene	0.16
Hexachlorobutadiene	0.0678
2-Hexanone	0.2982
Isopropylbenzene	85.2
4-Methyl-2-pentanone (MIBK)	8.04
Methyl tert-butyl ether (MTBE)	0.092
Methylene Chloride	0.038
Styrene	300
1,1,1,2-Tetrachloroethane	0.0156
1,1,2,2-Tetrachloroethane	0.0024
Tetrachloroethene (PCE)	2.4
Toluene	200
1,2,3-Trichlorobenzene	20
1,2,4-Trichlorobenzene	0.4074
1,1,1-Trichloroethane	400
1,1,2-Trichloroethane	0.0046
Trichloroethene (TCE)	0.02
Trichlorofluoromethane	190
1,2,3-Trichlorobenzene	20
1,2,4-Trimethylbenzene	16
1,3,5-Trimethylbenzene	92
Vinyl chloride	0.00051
Xylene (mixed)	25
o-Xylene	1
PAHs	
Acenaphthene	29
Anthracene	29
Benzo(a)anthracene	0.15
Benzo(a)pyrene	0.015
Benzo(b)fluoranthene	0.15
Benzo(k)fluoranthene	1.1
Chrysene	14

Please see notes at end of table.

Table 2
Clean Fill Screening Criteria
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Clean Fill Concentrations ¹
	<i>Concentrations in milligrams per kilogram (mg/kg)</i>
PAHs	
Dibenz(a,h)anthracene	0.015
Fluoranthene	29
Fluorene	29
Indeno(1,2,3-cd)pyrene	0.15
Naphthalene	0.087
Pyrene	1,700
SVOCs	
Aniline	0.3036
Benzyl alcohol	16.02
Bis(2-ethylhexyl) Phthalate	4.5
Butyl benzyl phthalate	260
4-Chloroaniline	0.012
2-Chlorophenol	60
Dibenzofuran	0.002
1,2-Dichlorobenzene	70
1,4-Dichlorobenzene	0.081
2,4-Dichlorophenol	20
Di-n-butylphthalate	0.45
Diethylphthalate	100
Dimethylphthalate	200
2,4-Dimethylphenol	20
1,2-Dinitrobenzene	0.168
1,3-Dinitrobenzene	0.1644
1,4-Dinitrobenzene	0.1644
4,6-Dinitro-2-methylphenol	0.2766
2,4-Dinitrophenol	20
2,4-Dinitrotoluene	0.0354
2,6-Dinitrotoluene	4.2
Di-n-octyl phthalate	610
Hexachlorobenzene	0.26
Hexachlorobutadiene	0.0678
Hexachlorocyclopentadiene	10
Hexachloroethane	0.51
Isophorone	1.596
2-Methylnaphthalene	310
2-Methylphenol	50

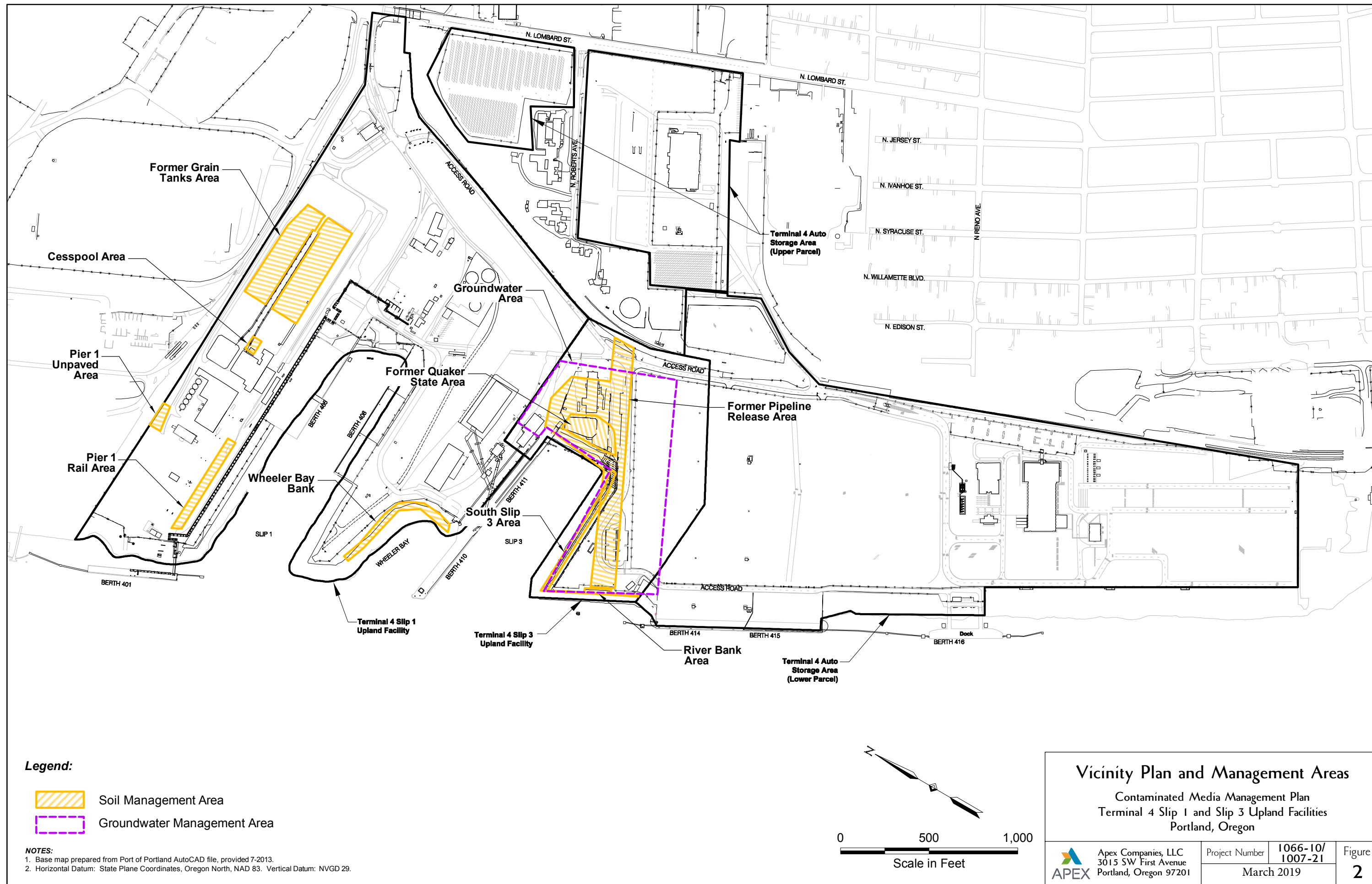
Please see notes at end of table.

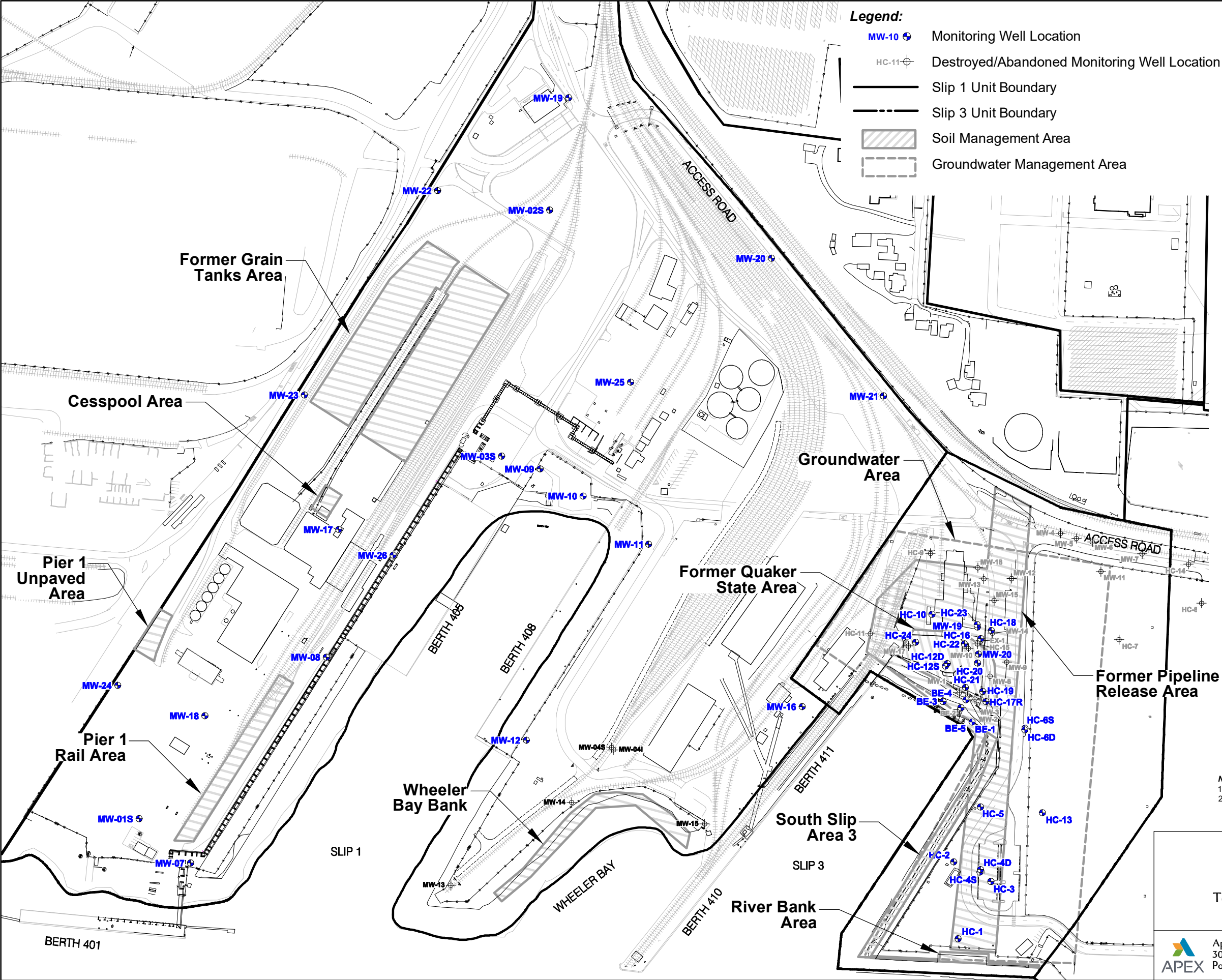
Table 2
Clean Fill Screening Criteria
Final Interim Contaminated Media Management Plan - Terminal 4
Port of Portland, Portland, Oregon

	DEQ Clean Fill Concentrations ¹
	<i>Concentrations in milligrams per kilogram (mg/kg)</i>
SVOCs	
2-Nitroaniline	5.646
4-Nitroaniline	0.1218
Nitrobenzene	0.0084
N-Nitrosodimethylamine	0.0023
N-Nitroso-di-n-propylamine	0.0012
N-Nitrosodiphenylamine	4.5
Phenol	30
Pyridine	0.3864
2,3,4,6-Tetrachlorophenol	20
1,2,4-Trichlorobenzene	0.4074
2,4,5-Trichlorophenol	4
Chlorinated Pesticides	
Aldrin	0.011
Chlordane (technical)	1.3
Dieldrin	0.0049
4,4'-DDD	0.021
4,4'-DDE	0.021
4,4'-DDT	0.021
Endosulfan (alpha-beta)	20
Endrin	0.04
Heptachlor	0.1
Heptachlor Epoxide	0.053
Hexachlorocyclohexane, alpha	0.07
Hexachlorocyclohexane, gamma	0.38
MCPA	0.24
Toxaphene	0.44
PCBs	
Total PCBs	0.2

Note:

1. Oregon Department of Environmental Quality, Internal Management Directive, Clean Fill Determinations, July 23, 2014 (see <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>).





Well ID	Northing	Easting	Well ID	Northing	Easting
Terminal 4 Slip 1			Terminal 4 Slip 3		
T4S1MW-01s	715157.5	7618979.3	HC-1	712793.7	7619918.2
T4S1MW-02s	714999.8	7621229	HC-2	712923.7	7620115.84
T4S1MW-03s	714749.8	7620500.8	HC-3	712794.5	7620120.8
T4S1MW-07	714952.7	7618940.6	HC-4s	712837.9	7620128.85
T4S1MW-08	714907.7	7619696.7	HC-4d	712840.5	7620136.65
T4S1MW-17	715070.4	7620055.6	HC-5	712936.7	7620303.08
T4S1MW-19	715121.3	7621556.74	HC-6s	712939.3	7620581.34
T4S1MW-22	715327.7	7621108.5	HC-6d	712936.7	7620576.14
T4S1MW-23	715368.4	7620360.1	HC-12s	713246.1	7620623.661
T4S1MW-24	715419.1	7619301.4	HC-12d	713245.2	7620633.519
T4S1MW-26	714886.2	7620070.58	HC-10	713361.5	7620741.21
T4S1MW-09	714627.9	7620525.8	HC-13	712762.8	7620382.88
T4S1MW-10	714471.7	7620519.9	HC-16	713194.2	7620751.483
T4S1MW-11	714223.3	7620492.2	HC-17R	713083.9	7620591.629
T4S1MW-12	714247.9	7619783	HC-18	713178.8	7620789.26
T4S1MW-16	713565.2	7620296.1	HC-19	713221.0	7620776.712
T4S1MW-18	715140.6	7619354.3	HC-20	713165.5	7620681.58
T4S1MW-20	714335.7	7621441.4	HC-21	713160.2	7620597.82
T4S1MW-21	713826.0	7621247.3	HC-22	713229.4	7620712.15
T4S1MW-25	714520.1	7620895.77	HC-23	713225.4	7620782.62
			HC-24	713362.3	7620641.69
			MW-19	713221.0	7620776.712
			MW-20	713176.7	7620706.433
			BE-1	713089.4	7620516.3
			BE-3	713198.2	7620525.9
			BE-4	713139.9	7620565.8
			BE-5	713141.0	7620537.231

NOTES:
1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83.
Vertical Datum: NVGD 29.

Monitoring Well Locations Contaminated Media Management Plan Terminal 4 Slip 1 and Slip 3 Upland Facilities Portland, Oregon

Appendix A

Pier 1 Unpaved Area

Appendix A – Pier 1 Unpaved Area

A.1 Pier 1 Unpaved Area Description

Figure A is a site plan of the Pier 1 Unpaved Area including coordinates defining the area boundary. This area covers approximately 0.2 acres. This area was suspected of being impacted by industrial activities on adjacent property to the north. Soil within the depth range of 0 to 2 feet bgs contains polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Total petroleum hydrocarbons as heavy oil (TPH-Dx), phthalates, polychlorinated biphenyls (PCBs), and metals were also detected above background levels. Degraded asphalt from nearby pavement may also be a source of PAHs. Groundwater was found to meet acceptable risk levels. Figure A shows the soil sample locations. Tables in this Appendix A summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Ash Creek/Newfields, 2007).

A.2 Restrictions on Use of the Pier 1 Unpaved Area

Routine industrial worker use¹ of this area is not allowed until the soil with chemicals above Screening Levels is removed or capped.

A.3 Ongoing Remediation Activities in the Pier 1 Unpaved Area

There are no ongoing remediation activities in this area.

A.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix A.

¹ "Routine industrial worker use" constitutes being within a Management Area on a frequency and duration consistent with DEQ risk criteria for occupational use (8 hours per day, 250 days per year). Short-term activities that would not result in exposure to soil (e.g., passing through a Management Area) would not be considered routine industrial use.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

A.5 Soil Handling in the Pier 1 Unpaved Area

Until demonstrated otherwise (such as through characterization as described in Section A.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents² to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section A.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

² The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1³ – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.⁴
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use

³ The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

⁴ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

existing data in this Appendix or new data collected in accordance with Section A.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

A.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁵ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

A.7 Characterization of Soil

This area is characterized by a single sample, so additional sampling will be conducted if re-use as fill or disposal in a licensed landfill is being considered. In that event, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁶ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, phthalates, PCBs, and metals. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, locations, and methodology include the following:

⁵ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁶ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁷ Samples should be collected from the stored materials and analyzed for the chemicals identified in Method A above.

Soil should be stored in a stockpile or drop box managed in accordance with Section A.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material be characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums or excavation equipment.

A.8 Notification, Approvals, and Reporting

A.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

⁷ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

A.8.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 2356. The report will be maintained in the Port Terminal 4 Slip 1 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

A.9 References

Ash Creek/Newfields, 2007. *Remedial Investigation Report*, Terminal 4 Slip 1 Upland Facility, Port of Portland, Portland, Oregon. August 2007.

MANAGEMENT AREA		
Station	Northing	Easting
A	715431	7619423
B	715423	7619569
C	715380	7619569
D	715360	7619422

Legend:

- MW-24**  Monitoring Well Location
- S-6**  Soil Boring Location
-  Station Location

0 100 200
Scale in Feet

Pier 1 Unpaved Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number **1066-10/1007-21**
March 2019

Appendix
A

TABLE 6A
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-6	T4S1S-7		DEQ Risk-Based Concentrations ⁸		Hot Spot Levels
	T4S1S-6 0 - 0.5 3/22/2005	T4S1S-7 0 - 0.5 3/22/2005		Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
HCID (mg/kg)						
Gasoline Range	20 U	20 U	U	20,000	9,700	97,000
Diesel Range	50 U	50 U	U	14,000	4,600	46,000
Residual Range	100 U	Det	U	14,000	4,600	46,000
TPH (mg/kg)						
Gasoline Range	--	--		20,000	9,700	97,000
Diesel Range	--	100 DH		14,000	4,600	46,000
Residual Range	--	960 DO		14,000	4,600	46,000

Notes:

1. TPH = Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH). Diesel and residual range performed with silica gel cleanup.
2. mg/kg = Milligrams per kilogram.
3. -- = Not analyzed.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. H = The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
6. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
7. D = Dilution.
8. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
9. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
10. Residual Range concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 7A
SOIL CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-6	T4S1S-7	DEQ Risk-Based Concentrations ⁵		Hot Spot Levels
	T4S1S-6 0 - 0.5 3/22/2005	T4S1S-7 0 - 0.5 3/22/2005	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
PAHs (µg/kg)					
Naphthalene	330 U, J	91 J	23,000	580,000	2,300,000
2-Methylnaphthalene	330 U, J	65 J	--	--	--
Acenaphthylene	330 U, J	97 J	--	--	--
Acenaphthene	340 U, J	350 J	70,000,000	21,000,000	210,000,000
Fluorene	340 U, J	180 J	47,000,000	14,000,000	140,000,000
Dibenzofuran	340 U, J	100 J	--	--	--
Phenanthrene	100 J	1,700 J	--	--	--
Anthracene	24 J	390 J	350,000,000	110,000,000	1,100,000,000
Fluoranthene	110 J	3,100	30,000,000	10,000,000	100,000,000
Pyrene	170 J	2,700	23,000,000	7,500,000	75,000,000
Benzo(b)fluoranthene	210 J	3,800	2,900	24,000	290,000
Benzo(k)fluoranthene	85 J	1,100 J	29,000	240,000	2,900,000
Benzo(a)anthracene	100 J	2,200	2,900	24,000	290,000
Chrysene	140 J	2,500	290,000	2,400,000	29,000,000
Benzo(a)pyrene	150 J	2,800	290	2,400	29,000
Indeno(1,2,3-cd)pyrene	130 J	2,500	2,900	24,000	290,000
Dibenz(a,h)anthracene	35 J	660	290	2,400	29,000
Benzo(g,h,i)perylene	140 J	2,600	--	--	--

Notes:

1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
6. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 8A
SOIL CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS (EXCEPT PAHs)

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-6	T4S1S-7	DEQ Risk-Based Concentrations ⁵		Hot Spot Levels
	T4S1S-6	T4S1S-7	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
	0 - 0.5	0 - 0.5			
	3/22/2005	3/22/2005			
SVOCs (µg/kg)					--
Phenol	24 J	50 J	--	--	--
Di-n-butyl Phthalate	65 J	71 J	--	--	--
Bis(2-ethylhexyl) Phthalate	400	720	160,000	1,300,000	16,000,000

Notes:

1. Only detected compounds are reported in the table.
2. SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270C.
3. µg/kg = Micrograms per kilogram.
4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
5. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
6. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 10A
SOIL CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-6	T4S1S-7	DEQ Risk-Based Concentrations ⁵		Hot Spot Levels
	T4S1S-6	T4S1S-7	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact Occupational/Cons truction Worker
PCBs (mg/kg)					
Aroclor 1254	0.062 J	0.10	--	--	--
Aroclor 1260	0.089	0.17	--	--	--
Total PCBs	0.151	0.27	0.59	4.9	59

Notes:

1. Only detected compounds are reported in the table.
2. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
3. mg/kg = Milligrams per kilogram.
4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).

TABLE 12A
SOIL CHEMISTRY RESULTS: METALS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-6	T4S1S-7	DEQ Clean Fill ⁵	DEQ Risk-Based Concentrations ⁶		Hot Spot Levels
Sample ID:	T4S1S-6	T4S1S-7	Background	Direct Soil Contact -	Direct Soil Contact -	Direct Soil Contact -
Sample Interval:	0 - 0.5	0 - 0.5	Concentrations -	Occupational	Construction Worker	Occupational/Construction
Date Sampled:	3/22/2005	3/22/2005	Portland Basin			Worker
Metals (mg/kg)						
Antimony	0.22 J	1.1 J	0.56	--	--	--
Arsenic	2.58 J	6.57 J	8.8	1.9	15	190
Beryllium	0.296	0.572	21	2,300	700	70,000
Cadmium	0.387	1.95	0.63	1,100	350	35,000
Chromium	14.6	152	76	>Max	530,000	5,300,000
Copper	16.2	70.3	34	47,000	14,000	140,000
Lead	16.9	195	28	800	800	8,000
Mercury	0.061	0.215	0.23	350	110	11,000
Nickel	16.5	19.4	47	22,000	7,000	700,000
Selenium	0.1 U, J	0.1 J	0.71	--	--	--
Silver	0.044	1.33	4.2	5,800	1,800	18,000
Thallium	0.048	0.118	5.2	--	--	--
Zinc	92.3	521	180	--	--	--

Notes:

1. Metals using EPA 6000-7000 Series Methods.
2. mg/kg = Milligrams per kilogram.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. Oregon Clean Fill Determinations, Oregon Department of Environmental Quality, July 23, 2014 (see <http://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>)
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed Background Concentrations and one or more DEQ Risk-Based Concentrations values.

Appendix B

Pier 1 Rail Area

Appendix B – Pier 1 Rail Area

B.1 Pier 1 Rail Area Description

Figure B is a site plan of the Pier 1 Rail Area including coordinates defining the area boundary. This area covers approximately 0.7 acres. Stained soil was historically observed along rail siding track. Soil within the depth range of 0 to 1 foot bgs contains polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Total petroleum hydrocarbons as heavy oil (TPH-Dx) and polychlorinated biphenyls (PCBs) were also detected. Degraded asphalt from nearby pavement may be a source of PAHs. Groundwater was found to meet acceptable risk levels. Appendix B includes a figure showing sample locations and tables summarizing relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Ash Creek/Newfields, 2007).

B.2 Restrictions on Use of the Pier 1 Rail Area

Routine industrial worker use¹ of this area is not allowed until the soil with chemicals above Screening Levels is removed or capped.

B.3 Ongoing Remediation Activities in the Pier 1 Rail Area

There are no ongoing remediation activities in this area.

B.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix B.

The Health and Safety Plan content shall, at a minimum, describe the following:

¹ "Routine industrial worker use" constitutes being within a Management Area on a frequency and duration consistent with DEQ risk criteria for occupational use (8 hours per day, 250 days per year). Short-term activities that would not result in exposure to soil (e.g., passing through a Management Area) would not be considered routine industrial use.

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

B.5 Soil Handling in the Pier 1 Rail Area

Until demonstrated otherwise (such as through characterization as described in Section B.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents² to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section B.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:

² The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
- Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1³ – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
- If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
- The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.⁴
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section B.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

³ The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

⁴ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

B.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁵ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

B.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁶ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, and PCBs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional.

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.

⁵ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁶ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁷ Samples should be collected from the stored materials and analyzed for the chemicals identified in Method A above.

Soil should be stored in a stockpile or drop box managed in accordance with Section B.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums or excavation equipment.

B.8 Notification, Approvals, and Reporting

B.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a

⁷ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.

- For any other work, advance notice to DEQ is not required.

B.8.2 Reporting

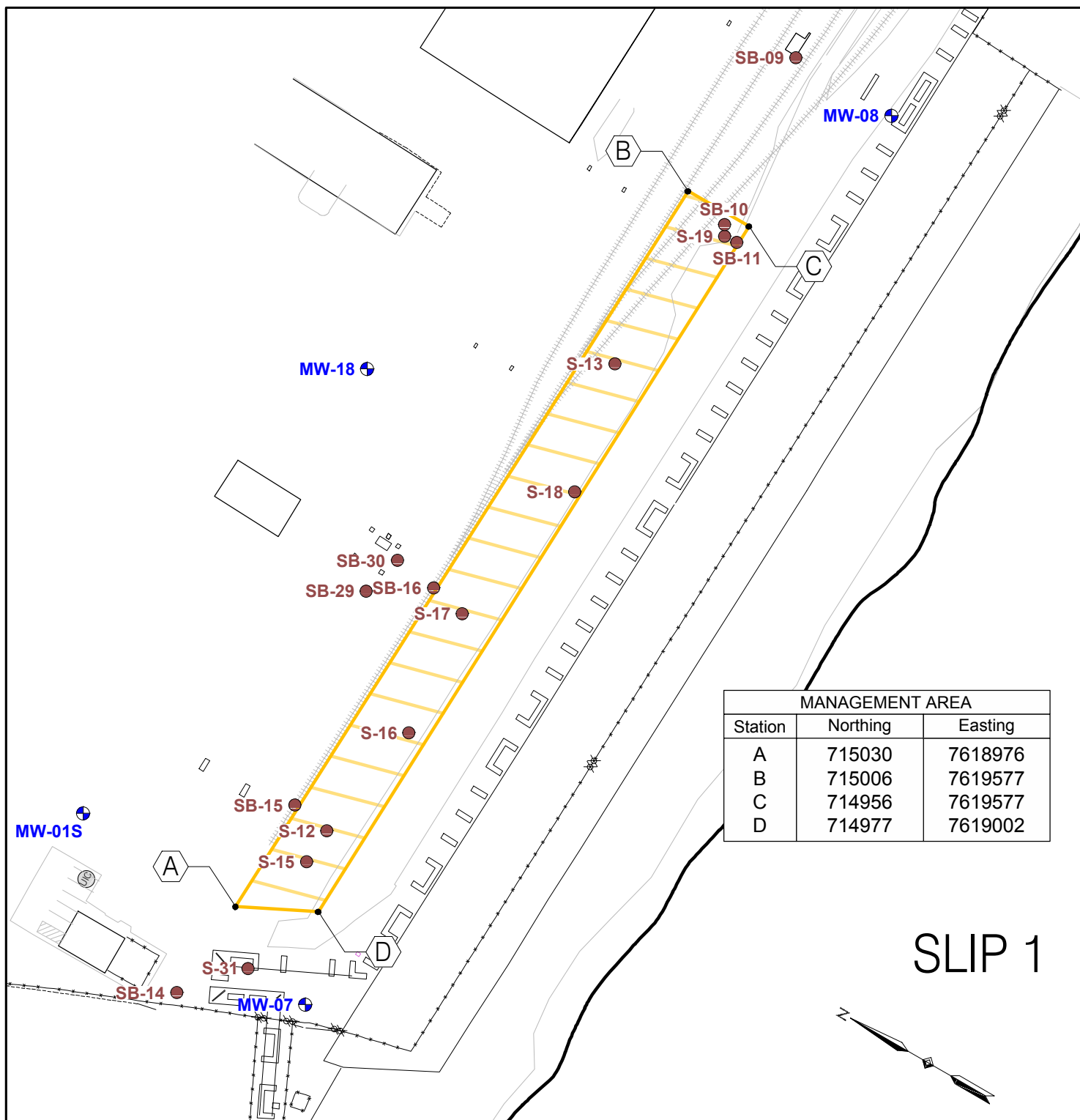
In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 2356. The report will be maintained in the Port Terminal 4 Slip 1 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

B.9 References

Ash Creek/Newfields, 2007. *Remedial Investigation Report*, Terminal 4 Slip 1 Upland Facility, Port of Portland, Portland, Oregon. August 2007.

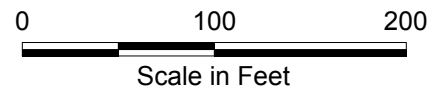


MANAGEMENT AREA		
Station	Northing	Easting
A	715030	7618976
B	715006	7619577
C	714956	7619577
D	714977	7619002

SLIP 1

Legend:

- MW-07  Monitoring Well Location
- S-12  Soil Boring Location
-  Station Location



Pier 1 Rail Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.



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Project Number 1066-10/
1007-21
March 2019

Appendix
B

TABLE 6A
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-9	T4S1SB-10	T4S1SB-10	T4S1SB-11	T4S1SB-11	T4S1SB-14	T4S1SB-15	T4S1SB-16	T4S1SB-29	T4S1SB-30	T4S1S-12	T4S1S-13	T4S1S-31	DEQ Risk-Based Concentrations ⁹		Hot Spot Levels
Sample ID:	T4S1SB-9-0-1	T4S1SB-10-1-1	T4S1SB-10-9-1	T4S1SB-11-1-1	T4S1SB-11-8-1	T4S1SB-14-1-1	T4S1SB-15-1-1	T4S1SB-16-1-1	T4S1SB-29-8-1	T4S1SB-30-8-1	T4S1S-12	T4S1S-13	T4S1S-31	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	1 - 2	8.5 - 10	1 - 2	8 - 9	1 - 2	1 - 2	0.5 - 1.5	8 - 9	8 - 9	0 - 0.5	0 - 0.5	0.5 - 2			
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/8/2004	9/8/2004	8/24/2004	9/3/2004	9/3/2004	9/3/2004	9/3/2004	3/22/2005	3/22/2005	7/10/2007			
HCID (mg/kg)																
Gasoline Range	--	13 U	17 U	15 U	16 U	20 U	17 U	15 U	17 U	14 U	--	--	17.8 U	20,000	9,700	97,000
Diesel Range	--	32 U	41 U	37 U	40 U	50 U	41 U	37 U	42 U	34 U	--	--	44.6 U	14,000	4,600	46,000
Residual Range	--	64 U	82 U	73 U	80 U	Det	82 U	74 U	83 U	67 U	--	--	89.2 U	14,000	4,600	46,000
TPH (mg/kg)																
Gasoline Range	17 U	--	--	--	--	--	--	--	--	--	--	--	--	20,000	9,700	97,000
Diesel Range	42 U	--	--	--	--	59 J	--	--	--	--	24 U	21 Z	--	14,000	4,600	46,000
Residual Range	84 U	--	--	--	--	780 O	--	--	--	--	170 Z	140 Z	--	14,000	4,600	46,000

- Notes:
1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH). Diesel and residual range performed with silica gel cleanup.
 2. mg/kg = Milligrams per kilogram.
 3. -- = Not analyzed.
 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 5. H = The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
 6. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
 7. D = Dilution.
 8. Z = The chromatographic fingerprint does not resemble a petroleum product.
 9. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
 10. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
 11. Residual Range concetrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 7A
SOIL CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-9	T4S1SB-14	T4S1SB-15	T4S1SB-16	T4S1S-12	T4S1S-12	T4S1S-12	T4S1S-13	T4S1S-13	T4S1S-13	T4S1S-15	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
Sample ID:	T4S1SB-9-0-1	T4S1SB-14-1-1	T4S1SB-15-1-1	T4S1SB-16-1-1	T4S1S-12	T4S1S-12-0.5	T4S1S-12-2	T4S1S-13	T4S1S-13-0.5	T4S1S-13-2	T4S1S-15-0.5	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	1 - 2	1 - 2	0.5 - 1.5	0 - 0.5	0.5 - 1	2 - 2.5	0 - 0.5	0.5 - 1	2 - 2.5	0.5 - 1			
Date Sampled:	9/2/2004	8/24/2004	9/3/2004	9/3/2004	3/22/2005	9/6/2005	9/6/2005	3/22/2005	9/6/2005	9/6/2005	9/6/2005			
PAHs (µg/kg)														
Naphthalene	3.1 J	10	2.8 J	2.4 J	76	24.9 J, D	14.2 U	28	40.2 J, D	69.6 U	17.5 U, D	23,000	580,000	2,300,000
2-Methylnaphthalene	1.5 J	6.8	1.4 J	1.5 J	42	--		16	--		--	--	--	--
Acenaphthylene	1.7 J	50	3.5 J	3.2 J	29	61.3 J, D	14.2 U	31	223 D	69.6 U	29 J, D	--	--	--
Acenaphthene	0.33 J	11	0.56 J	0.72 J	340	112 D	14.2 U	200	114 J, D	69.6 U	37.1 J, D	70,000,000	21,000,000	210,000,000
Fluorene	0.57 J	8.2	0.51 J	0.63 J	110	44.9 J, D	14.2 U	65	82.3 J, D	69.6 U	22.6 J, D	47,000,000	14,000,000	140,000,000
Dibenzofuran	0.49 J	7.5	0.54 J	0.75 J	62	--	--	36	--	--	--	--	--	--
Phenanthrene	4.8	260	7.9	7.3	2,000 D	588 D	6.75 J, D	1,300 D	677 D	87.9 D	258 D	--	--	--
Anthracene	2.6 J	68	4.4 J	5	350	179 D	14.2 U	220	627 D	40.6 J, D	78 D	350,000,000	110,000,000	1,100,000,000
Fluoranthene	11	520	18	15	6,400 D	1,460 D	20.6 D	3,900 D	1,860 D	275 D	667 D	30,000,000	10,000,000	100,000,000
Pyrene	14	560	25	20	5,800 D	1,380 D	18.3 D	3,800 D	1,810 D	225 D	734 D	23,000,000	7,500,000	75,000,000
Benzo(b)fluoranthene	7	320	15	16	6,200 D	1,830 D	20.9 D	3,900 D	3,060 D	323 J	616 D	2,900	24,000	290,000
Benzo(k)fluoranthene	12	260	13	12	4,200 D	1,150 D	16.3 D	3,300 D	1,810 D	213 J	627 D	29,000	240,000	2,900,000
Benzo(a)anthracene	5.5	210	11	9	3,900 D	998 D	14.1 J, D	2,400 D	1,300 D	185 D	446 D	2,900	24,000	290,000
Chrysene	11	340	17	15	4,900 D	1,380 D	20.1 D	3,200 D	1,780 D	228 D	585 D	290,000	2,400,000	29,000,000
Benzo(a)pyrene	6.1	320	8.9	12	6,000 D	1,310 D	20.1 D	3,800 D	1,760 D	256 J	616 D	290	2,400	29,000
Indeno(1,2,3-cd)pyrene	9.5	330	15	15	5,400 D	491 D	16.2 D	3,700 D	1,410 D	210 J	344 D	2,900	24,000	290,000
Dibenz(a,h)anthracene	2 J	53	2.6 J	2.7 J	1,100	166 D	5.04 J, D	780	500 D	70.1 J	117 D	290	2,400	29,000
Benzo(g,h,i)perylene	9.7	320	17	16	5,000 D	445 D	20.1 D	3,400 D	1,340 D	232 J	372 D	--	--	--

Sample Location:	T4S1S-16	T4S1S-17	T4S1S-18	T4S1S-19	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
Sample ID:	T4S1S-16-0.5	T4S1S-17-0.5	T4S1S-18-0.5	T4S1S-19-0.5	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1			
Date Sampled:	9/6/2005	9/6/2005	9/6/2005	9/6/2005			
PAHs (µg/kg)							
Naphthalene	140 U	71.8 U	14.2 U	70.8 U	23,000	580,000	2,300,000
2-Methylnaphthalene	--	--	--	--	--	--	--
Acenaphthylene	140 U	56.8 J, D	14.2 U	37.4 J, D	--	--	--
Acenaphthene	53.5 J, D	37.8 J, D	7.32 J, D	17.6 J, D	70,000,000	21,000,000	210,000,000
Fluorene	140 U	21.5 J, D	14.2 U	70.8 U	47,000,000	14,000,000	140,000,000
Dibenzofuran	--	--	--	--	--	--	--
Phenanthrene	313 D	203 D	37.6 D	136 D	--	--	--
Anthracene	66.1 J, D	115 D	8.62 J, D	50.2 J, D	350,000,000	110,000,000	1,100,000,000
Fluoranthene	853 D	490 D	88.8 D	359 D	30,000,000	10,000,000	100,000,000
Pyrene	900 D	552 D	99.2 D	456 D	23,000,000	7,500,000	75,000,000
Benzo(b)fluoranthene	1,080 D	631 D	79.5 D	342 D	2,900	24,000	290,000
Benzo(k)fluoranthene	695 D	604 D	85.1 D	378 D	29,000	240,000	2,900,000
Benzo(a)anthracene	581 D	358 D	57.3 D	249 D	2,900	24,000	290,000
Chrysene	789 D	467 D	72.0 D	335 D	290,000	2,400,000	29,000,000
Benzo(a)pyrene	830 D	571 D	83.8 D	354 D	290	2,400	29,000
Indeno(1,2,3-cd)pyrene	403 D	290 D	41.3 D	185 D	2,900	24,000	290,000
Dibenz(a,h)anthracene	142 D	99.4 D	14.5 D	61.6 J, D	290	2,400	29,000
Benzo(g,h,i)perylene	416 D	294 D	44.6 D	206 D	--	--	--

- Notes:
- PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
 - µg/kg = Micrograms per kilogram.
 - J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 - U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 - D = Dilution.
 - = Not analyzed.
 - Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
 - Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 8A
SOIL CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS (EXCEPT PAHs)

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-14	T4S1SB-15	T4S1SB-16	DEQ Risk-Based Concentrations ⁵		Hot Spot Levels
Sample ID:	T4S1SB-14-1-1	T4S1SB-15-1-1	T4S1SB-16-1-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	1 - 2	1 - 2	0.5 - 1.5			
Date Sampled:	8/24/2004	9/3/2004	9/3/2004			
SVOCs (µg/kg)						
Phenol	330 U	330 U	330 U	--	--	--
Di-n-butyl Phthalate	330 U	330 U	330 U	--	--	--
Bis(2-ethylhexyl) Phthalate	330 U	330 U	330 U	160,000	1,300,000	16,000,000

Notes:

1. Only detected compounds are reported in the table.
2. SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270C.
3. µg/kg = Micrograms per kilogram.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
6. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 9A
SOIL CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1SB-14	T4S1SB-15	T4S1SB-16	DEQ Risk-Based Concentrations ⁶		Hot Spot Levels
	T4S1SB-14-5-1	T4S1SB-15-3-1	T4S1SB-16-3-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
VOCs (µg/kg)						
Acetone	13 J	12 J	23 U	--	--	--
Carbon Disulfide	5.3 U	5.3 U	5.7 U	--	--	--
Dichloromethane (Methylene Chloride)	2.8 J	1.2 J	1.7 J	--	--	--
2-Butanone (MEK)	21 U	21 U	23 U	--	--	--
Chloroform	5.3 U	5.3 U	5.7 U	26,000	410,000	2,600,000
Carbon Tetrachloride	5.3 U	5.3 U	5.7 U	34,000	320,000	3,400,000
Benzene	5.3 U	5.3 U	5.7 U	37,000	380,000	3,700,000
Trichloroethene (TCE)	5.3 U	5.3 U	5.7 U	51,000	470,000	5,100,000
Toluene	5.3 U	5.3 U	5.7 U	88,000,000	28,000,000	280,000
Tetrachloroethene (PCE)	5.3 U	5.3 U	5.7 U	1,000,000	1,800,000	100,000,000
Chlorobenzene	5.3 U	5.3 U	5.7 U	8,700,000	4,700,000	47,000,000
Ethylbenzene	5.3 U	5.3 U	5.7 U	150,000	1,700,000	15,000,000
m,p-Xylenes	5.3 U	5.3 U	5.7 U			
o-Xylene	5.3 U	5.3 U	5.7 U	25,000,000	20,000,000	200,000,000
Isopropylbenzene	21 U	21 U	23 U	57,000,000	27,000,000	270,000,000
n-Propylbenzene	21 U	21 U	23 U	--	--	--
1,2,3-Trichlorobenzene	0.97 U	0.97 U	1.1 U	--	--	--
1,3,5-Trimethylbenzene	21 U	21 U	23 U	12,000,000	3,500,000	35,000,000
1,2,4-Trimethylbenzene	21 U	21 U	23 U	2,000,000	2,000,000	20,000,000
sec-Butylbenzene	21 U	21 U	23 U	--	--	--
4-Isopropyltoluene	21 U	21 U	23 U	--	--	--
1,4-Dichlorobenzene	5.3 U	5.3 U	5.7 U	64,000	1,300,000	6,400,000
n-Butylbenzene	21 U	21 U	23 U	--	--	--
Hexachlorobutadiene	21 U	21 U	23 U	--	--	--
Naphthalene	21 U	21 U	23 U	23,000	580,000	23,000,000

Notes:

- Only selected compounds are reported in the table.
- VOCs = Volatile Organic Compounds by EPA Method 8260B.
- µg/kg = Micrograms per kilogram.
- J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
- U = The compound was analyzed for but was not detected at or above the MRL/MDL.
- Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
- Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 10A
SOIL CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-12	T4S1S-13	DEQ Risk-Based Concentrations ⁵		Hot Spot Levels
Sample ID:	T4S1S-12	T4S1S-13	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Cons truction Worker
Sample Interval:	0 - 0.5	0 - 0.5			
Date Sampled:	9/13/2004	9/13/2004			
PCBs (mg/kg)					
Aroclor 1254	0.11	0.08	--	--	--
Aroclor 1260	0.13	0.17 P	--	--	--
Total PCBs	0.24	0.25	0.59	4.9	59

Notes:

1. Only detected compounds are reported in the table.
2. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
3. mg/kg = Milligrams per kilogram.
4. P = The GC or HPLC confirmation criterion was exceeded. The relative percent difference is greater than 40 percent between the two analytical results.

Appendix C

Former Grain Tanks Area

Appendix C – Former Grain Tanks Area

C.1 Former Grain Tanks Area Description

Figure C is a site plan of the Grain Tanks Area including coordinates defining the area boundary. This area covers approximately 6 acres. Following the demolition of surplus grain storage tanks on Terminal 4, the area was filled to prepare for future re-development. Prior to filling, the risk in this area was acceptable. The fill used was obtained from stockpiles on Terminal 4. The stockpiles were excess soil from site grading during historical development projects on Terminal 4. Prior to use as fill, the stockpiled soil was sampled. The west stockpile was found to contain polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Asphalt concrete entrained in soil during its excavation may be the source of the PAHs. In the east stockpile, PAHs were below Screening Levels. Total petroleum hydrocarbons as heavy oil (TPH-Dx), polychlorinated biphenyls (PCBs), and pesticides were also detected in soil present prior to placement of the fill. Groundwater was found to meet acceptable risk levels. Figure C shows the locations of samples collected prior to the fill placement. Also included in this appendix is a figure from February 2007 showing the locations of samples collected from the soil stockpiles. Tables in this Appendix C summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Ash Creek/Newfields, 2007) and the soil stockpile investigation report (Ash Creek, 2007).

When the Former Grain Tanks Area was filled, soil from the east stockpile (where PAHs were below Screening Levels) was placed at the surface to a minimum depth of 12 inches. Therefore, a minimum of 12 inches of soil meeting the Screening Levels covers this Management Area. Beneath this surface cover, a layer of soil approximately 2 feet thick may contain PAHs above Screening Levels. Record drawings showing plan view and cross-sections of the fill are included in this appendix.

C.2 Restrictions on Use of the Former Grain Tanks Area

Provided there is no disturbance of soil, use of this area is generally allowed. Uses that disturb soil would require implementation of this CMMP.

C.3 Ongoing Remediation Activities in the Former Grain Tanks Area

There are no ongoing remediation activities in this area.

C.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any soil-disturbing activity within this Management Area must comply with the

following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix C.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

C.5 Soil Handling in the Former Grain Tanks Area

Until demonstrated otherwise (such as through characterization as described in Section C.7), soil from a depth of greater than 12 inches in this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents¹ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section C.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.

¹ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced with a minimum cover of 12 inches of clean soil provided that it meets the other requirements of the project and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank of a storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1² – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.³

² The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

³ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present,

- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section C.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

C.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁴ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

C.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁵ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, pesticides, and PCBs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

⁴ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁵ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology including the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁶ Samples should be collected from the stored materials and analyzed for the chemicals identified in Method A above.

Soil should be stored in a stockpile or drop box managed in accordance with Section C.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogenous material. The number of samples should be increased based on the relative heterogeneity of the material.

⁶ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

C.8 Notification, Approvals, and Reporting

C.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

C.8.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

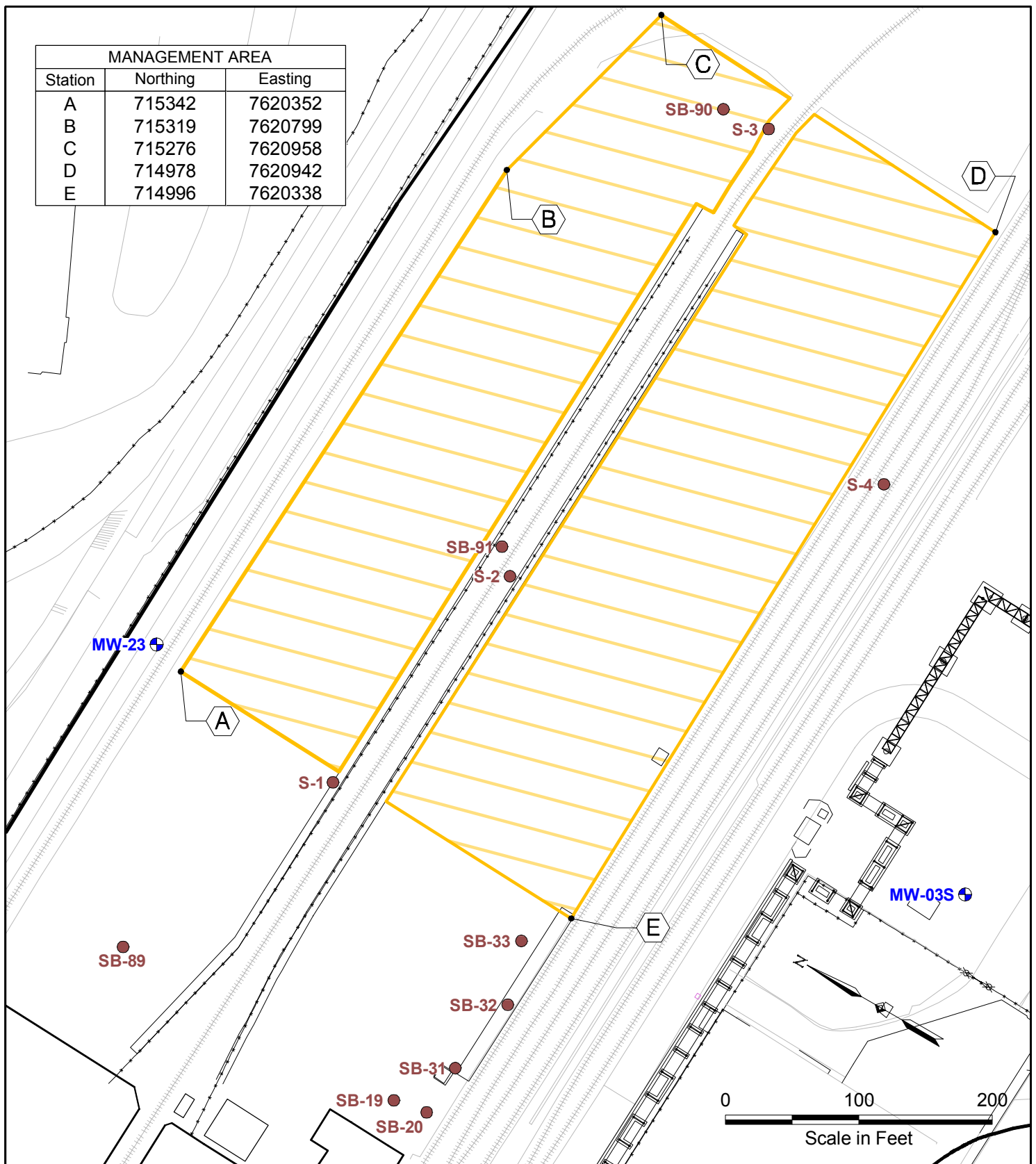
The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 2356. The report will be maintained in the Port Terminal 4 Slip 1 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

C.9 References

Ash Creek/Newfields, 2007. *Remedial Investigation Report*, Terminal 4 Slip 1 Upland Facility, Port of Portland, Portland, Oregon. August 2007.

Ash Creek Associates, 2007. Soil Stockpile Sampling Results, Terminal 4, Portland, Oregon. February 14, 2007.

MANAGEMENT AREA		
Station	Northing	Easting
A	715342	7620352
B	715319	7620799
C	715276	7620958
D	714978	7620942
E	714996	7620338



Legend:

- MW-23  Monitoring Well Location
- S-3  Soil Boring Location
- A Station Location

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.

Former Grain Tanks Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

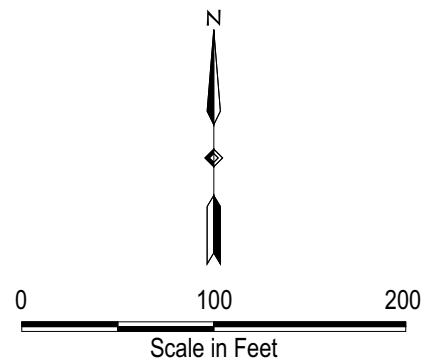
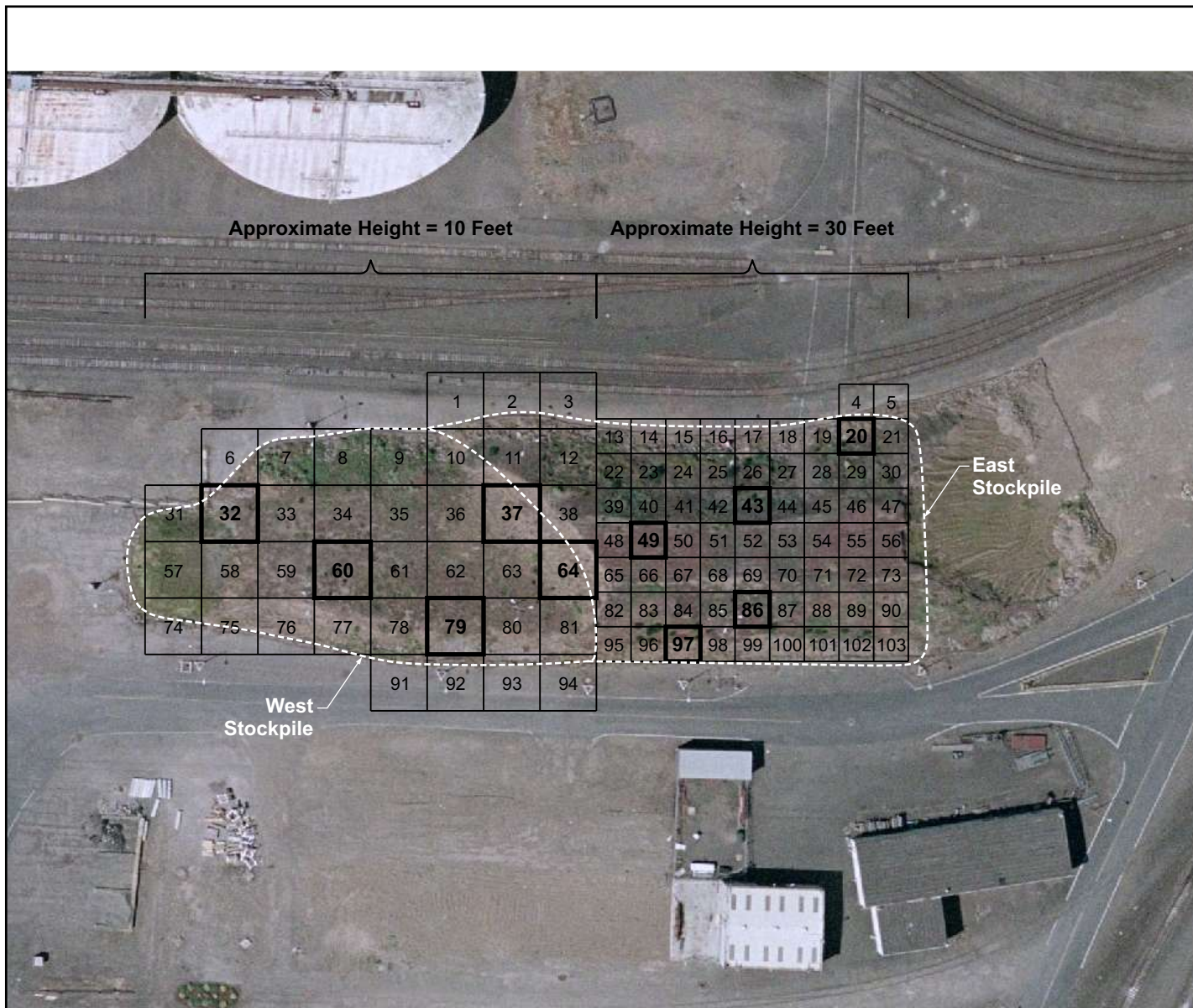
Project Number

1066-10/
1007-21

March 2019

Appendix

C



Legend:

20 Sample Location and Number

Note: Recent aerial photograph provided by MetroMap.

Soil Sampling Locations

Soil Stockpile Sampling
Terminal 4
Portland, Oregon

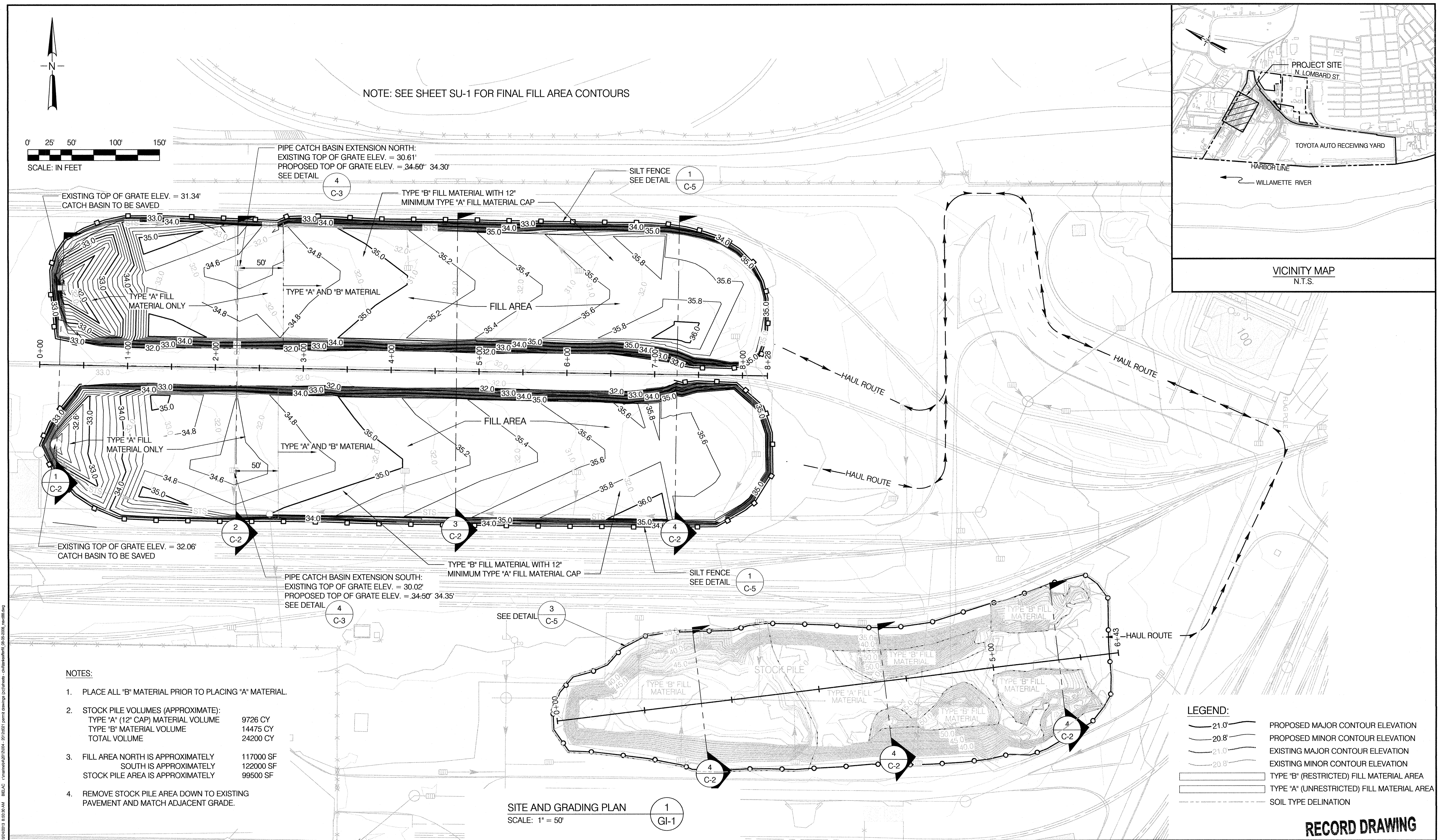


Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number **1258-02**

February 2007

Figure
2



NOTES:

- PLACE ALL "B" MATERIAL PRIOR TO PLACING "A" MATERIAL.
- STOCK PILE VOLUMES (APPROXIMATE):
TYPE "A" (12" CAP) MATERIAL VOLUME 9726 CY
TYPE "B" MATERIAL VOLUME 14475 CY
TOTAL VOLUME 24200 CY
- FILL AREA NORTH IS APPROXIMATELY 117000 SF
SOUTH IS APPROXIMATELY 122000 SF
STOCK PILE AREA IS APPROXIMATELY 99500 SF
- REMOVE STOCK PILE AREA DOWN TO EXISTING PAVEMENT AND MATCH ADJACENT GRADE.

LEGEND:

- 21.0' PROPOSED MAJOR CONTOUR ELEVATION
- 20.8' PROPOSED MINOR CONTOUR ELEVATION
- 21.0' EXISTING MAJOR CONTOUR ELEVATION
- 20.8' EXISTING MINOR CONTOUR ELEVATION
- TYPE "B" (RESTRICTED) FILL MATERIAL AREA
- TYPE "A" (UNRESTRICTED) FILL MATERIAL AREA
- SOIL TYPE DELINATION

SITE AND GRADING PLAN
SCALE: 1" = 50'

RECORD DRAWING

PORT OF PORTLAND PORTLAND, OREGON										TERMINAL 4			
										PIER 1 SITE PREPARATION SITE AND GRADING PLAN			
DESIGNED BY D. NORLIN					DRAWN BY C. BIELANSKI					CHECKED BY D. BREEN			
DATE JUNE 2012					SUBMITTED BY DEAN NORLIN					TYPE T4 2012-4			
SCALE 1" = 50'					DRAWING NO. 1/5 (C-1)								

NO.	DATE	BY	REVISIONS	CKD	APPVD
3	10/08/13	CPB	RECORD DRAWING		
2	9/10/12	CPB	SHEET REISSUED FOR B.E.S. COMMENTS		
1	08/15/12	CPB	SHEET REISSUED FOR C.O.P. PERMIT		

NO.	DATE	BY	REVISIONS	CKD	APPVD

Table 1
Soil Analytical Results
Terminal 4 Soil Stockpile
Portland, Oregon

Sample ID Lab ID Date Sampled	West Stockpile					East Stockpile					DEQ Risk-Based Concentrations ⁸		Hot Spot Levels
	Pile A-32 PPL002-10 11/29/2006	Pile A-37 PPL002-07 11/29/2006	Pile A-60 PPL002-09 11/29/2006	Pile A-64 PPL002-04 11/29/2006	Pile A-79 PPL002-08 11/29/2006	Pile A-20 PPL002-01 11/29/2006	Pile A-43 PPL002-02 11/29/2006	Pile A-49 PPL002-03 11/29/2006	Pile A-86 PPL002-06 11/29/2006	Pile A-97 PPL002-05 11/29/2006	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Total Petroleum Hydrocarbons (mg/kg)													
TPH - Diesel Range Hydrocarbons	15.1 U	14.6 U	113 U	14.1 U	14.8 U	13.4 U	14 U	13.5 U	13.2 U	13.4 U	14,000	4,600	46,000
TPH - Heavy Oil Range Hydrocarbons	65.3	116	640	28.1 U	115	26.8 U	28 U	27 U	26.4 U	26.7 U	14,000	4,600	46,000
PAHs (µg/kg)													
Acenaphthene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	70,000,000	21,000,000	210,000,000
Acenaphthylene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	--	--	--
Anthracene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	350,000,000	110,000,000	1,100,000,000
Benzo(a)anthracene	194	934	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	17.2	17.7	2,900	24,000	290,000
Benzo(a)pyrene	179	1290	145	69.3	124	15.5	14.8 U	14.7 U	32.2	39.2	290	2,400	29,000
Benzo(b)fluoranthene	173	773 U	115	44.9	81.2	14.5 U	14.8 U	14.7 U	21.6	27.3	2,900	24,000	290,000
Benzo(ghi)perylene	159 U	911	158	97.9	128	17.1	14.8 U	14.7 U	31.8	44.8	--	--	--
Benzo(k)fluoranthene	159 U	869	89.8	46.8	84.3	14.5 U	14.8 U	14.7 U	23.5	28.8	29,000	240,000	2,900,000
Chrysene	334	1290	114	44.4	92.9	14.5 U	14.8 U	14.7 U	24	25.1	290,000	2,400,000	29,000,000
Dibenzo(a,h)anthracene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	290	2,400	29,000
Fluoranthene	908	1660	72.4 U	29.6 U	71.5	14.5 U	14.8 U	14.7 U	21.8	19.8	30,000,000	10,000,000	100,000,000
Fluorene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	47,000,000	14,000,000	140,000,000
Indeno(1,2,3-cd)pyrene	159 U	773 U	95.8	62.9	86.5	14.5 U	14.8 U	14.7 U	22.2	31.6	2,900	24,000	290,000
Naphthalene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	23,000	580,000	2,300,000
Phenanthrene	159 U	773 U	72.4 U	29.6 U	62.2 U	14.5 U	14.8 U	14.7 U	14.3 U	14.6 U	--	--	--
Pyrene	955	2200	46.7	32.1	101	14.5 U	14.8 U	14.7 U	103	31.8	23,000,000	7,500,000	75,000,000

Notes:

1. TPH = Total petroleum hydrocarbons by Northwest Method NW TPH-Dx.
2. mg/kg = milligram per kilogram (ppm).
3. PAHs = Polycyclic aromatic hydrocarbons by EPA Method 8270SIM.
4. µg/kg = microgram per kilogram (ppb).
5. U = Not detected above the indicated method reporting limit.
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
8. Residual Range concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 6A
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval (Note 10): Date Sampled:	T4S1SB-19 T4S1SB-19-9-1 8.5 - 10 9/3/2004	T4S1SB-20 T4S1SB-20-9-1 8.5 - 10 9/3/2004	T4S1SB-31 T4S1SB-31-0-1 0.5 - 1.5 9/3/2004	T4S1SB-32 T4S1SB-32-0-1 0.5 - 1.5 9/3/2004	T4S1SB-33 T4S1SB-33-0-1 0.25 - 1 9/3/2004	T4S1SB-89 T4S1SB-89-0-1 0.5 - 2.5 9/7/2005	T4S1SB-90 T4S1SB-90-0-1 1 - 3 9/7/2005	T4S1SB-91 T4S1SB-91-0-1 0.5 - 2.5 9/7/2005	DEQ Risk-Based Concentration ¹¹		Hot Spot Levels
									Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
TPH (mg/kg)											
Gasoline Range	--	--	1.5 J	6.7 Z	2.5 J	--	--	--	20,000	9,700	97,000
Diesel Range	20 U	20 U	110 H	20 U	22 U	28.6 U	26.8 U	26.3 U	14,000	4,600	46,000
Residual Range	8.7 J	12 J	1,200 O	80 U	45 J	55 J, D	53.6 U	74.3 D	14,000	4,600	46,000

Notes:

1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH). Diesel and residual range performed with silica gel cleanup.
2. mg/kg = Milligrams per kilogram.
3. -- = Not analyzed.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. H = The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
6. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
7. D = Dilution.
8. Z = The chromatographic fingerprint does not resemble a petroleum product.
9. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
10. Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
11. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
12. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
13. Residual Range concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 7A
SOIL CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-31	T4S1SB-32	T4S1SB-33	T4S1SB-89	T4S1SB-90	DEQ Risk-Based Concentrations ⁸		Hot Spot Levels
Sample ID:	T4S1SB-31-0-1	T4S1SB-32-0-1	T4S1SB-33-0-1	T4S1SB-89-0-1	T4S1SB-90-0-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval (Note 7):	0.5 - 1.5	0.5 - 1.5	0.25 - 1	0.5 - 2.5	1 - 3			
Date Sampled:	9/8/2004	9/3/2004	9/3/2004	9/7/2005	9/7/2005			
PAHs (µg/kg)								
Naphthalene	33	1.3 J	9.9	15.2 U	14.4 U	23,000	580,000	2,300,000
2-Methylnaphthalene	50	0.66 J	15	--	--	--	--	--
Acenaphthylene	14	5 U	7.7	15.2 U	14.4 U	--	--	--
Acenaphthene	1.7 J	5 U	0.78 J	15.2 U	14.4 U	70,000,000	21,000,000	210,000,000
Fluorene	2.7 J	5 U	1.4 J	15.2 U	14.4 U	47,000,000	14,000,000	140,000,000
Dibenzofuran	21	5 U	4 J	--	--	--	--	--
Phenanthrene	66	0.66 J	46	7.65 J	14.4 U	--	--	--
Anthracene	20	5 U	9.4	15.2 U	14.4 U	350,000,000	110,000,000	1,100,000,000
Fluoranthene	73	1.3 J	48	15.3 D	3.80 J, D	30,000,000	10,000,000	100,000,000
Pyrene	110	1.5 J	72	24.7 D	7.79 J, D	23,000,000	7,500,000	75,000,000
Benzo(b)fluoranthene	140	1 J	61	18.9 D	4.00 J, D	2,900	24,000	290,000
Benzo(k)fluoranthene	67	0.66 J	49	13.9 J, D	14.4 U	29,000	240,000	2,900,000
Benzo(a)anthracene	66	0.98 J	38	10.1 J, D	14.4 U	2,900	24,000	290,000
Chrysene	150	0.91 J	63	21.4 D	3.84 J, D	290,000	2,400,000	29,000,000
Benzo(a)pyrene	97	0.65 J	58	16.9 D	4.86 J, D	290	2,400	29,000
Indeno(1,2,3-cd)pyrene	84	0.92 J	61	8.80 J, D	14.4 U	2,900	24,000	290,000
Dibenz(a,h)anthracene	24	5 U	13	15.2 U	14.4 U	290	2,400	29,000
Benzo(g,h,i)perylene	110	0.87 J	67	11.0 J, D	3.68 J, D	--	--	--

Notes:

1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. D = Dilution.
6. -- = Not analyzed.
7. Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
8. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
9. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 9A
SOIL CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-31	T4S1SB-32	T4S1SB-33	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
Sample ID:	T4S1SB-31-3-1	T4S1SB-32-3-1	T4S1SB-33-2-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval (Note 6): Date Sampled:	3 - 3.5 9/3/2004	3 - 3.5 9/3/2004	1.5 - 2 9/3/2004			
VOCs (µg/kg)						
Acetone	13 J	22 U	17 J	--	--	--
Carbon Disulfide	5.4 U	5.4 U	5.5 U	--	--	--
Dichloromethane (Methylene Chloride)	1.3 J	1.7 J	2.6 J	--	--	--
2-Butanone (MEK)	22 U	22 U	22 U	--	--	--
Chloroform	5.4 U	5.4 U	5.5 U	26,000	410,000	2,600,000
Carbon Tetrachloride	5.4 U	5.4 U	5.5 U	34,000	320,000	3,400,000
Benzene	5.4 U	5.4 U	5.5 U	37,000	380,000	3,700,000
Trichloroethene (TCE)	5.4 U	5.4 U	5.5 U	51,000	470,000	5,100,000
Toluene	5.4 U	5.4 U	5.5 U	88,000,000	28,000,000	280,000
Tetrachloroethene (PCE)	5.4 U	5.4 U	5.5 U	1,000,000	1,800,000	100,000,000
Chlorobenzene	5.4 U	5.4 U	5.5 U	8,700,000	4,700,000	47,000,000
Ethylbenzene	5.4 U	5.4 U	5.5 U	150,000	1,700,000	15,000,000
m,p-Xylenes	5.4 U	5.4 U	5.5 U	25,000,000	20,000,000	200,000,000
o-Xylene	5.4 U	5.4 U	5.5 U			
Isopropylbenzene	22 U	22 U	22 U	57,000,000	27,000,000	270,000,000
n-Propylbenzene	22 U	22 U	22 U	--	--	--
1,2,3-Trichlorobenzene	0.98 U	0.98 U	1.1 U	--	--	--
1,3,5-Trimethylbenzene	22 U	22 U	22 U	12,000,000	3,500,000	35,000,000
1,2,4-Trimethylbenzene	22 U	22 U	22 U	2,000,000	2,000,000	20,000,000
sec-Butylbenzene	22 U	22 U	22 U	--	--	--
4-Isopropyltoluene	22 U	22 U	22 U	--	--	--
1,4-Dichlorobenzene	5.4 U	5.4 U	5.5 U	64,000	1,300,000	6,400,000
n-Butylbenzene	22 U	22 U	22 U	--	--	--
Hexachlorobutadiene	22 U	22 U	22 U	--	--	--
Naphthalene	22 U	22 U	22 U	23,000	580,000	23,000,000

Notes:

- Only selected compounds are reported in the table.
- VOCs = Volatile Organic Compounds by EPA Method 8260B.
- µg/kg = Micrograms per kilogram.
- J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
- U = The compound was analyzed for but was not detected at or above the MRL/MDL.
- Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
- Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
- Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 10A
SOIL CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-1	T4S1S-2	T4S1S-3	T4S1SB-19	T4S1SB-20	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
Sample ID:	T4S1S-1	T4S1S-2	T4S1S-3	T4S1SB-19-9-1	T4S1SB-20-9-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval (Note 6):	0 - 0.5	0 - 0.5	0 - 0.5	8.5 - 10	8.5 - 10			
Date Sampled:	9/13/2004	9/13/2004	9/13/2004	9/3/2004	9/3/2004			
PCBs (mg/kg)								
Aroclor 1254	0.38	0.69	0.56	0.036 U	0.036 U	--	--	--
Aroclor 1260	0.25	0.42	0.53 P	0.036 U	0.036 U	--	--	--
Total PCBs	0.63	1.11	1.09 P	-- U	-- U	0.59	4.9	59

Notes:

1. Only detected compounds are reported in the table.
2. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
3. mg/kg = Milligrams per kilogram.
4. P = The GC or HPLC confirmation criterion was exceeded. The relative percent difference is greater than 40 percent between the two analytical results.
5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
6. Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
7. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
8. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 11A
SOIL CHEMISTRY RESULTS: PESTICIDES

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval (Note 7): Date Sampled:	T4S1SB-19 T4S1SB-19-0-1 0.5 - 1.5 9/3/2004	T4S1SB-20 T4S1SB-20-0-1 0.5 - 1 9/3/2004	T4S1SB-32 T4S1SB-32-0-1 0.5 - 1.5 9/3/2004	T4S1SB-89 T4S1SB-89-0-1 0.5 - 2.5 9/7/2005	T4S1SB-90 T4S1SB-90-0-1 1 - 3 9/7/2005	T4S1SB-90 T4S1SB-90-0-2 1 - 3 9/7/2005	T4S1S-1 T4S1S-1 0 - 0.5 3/22/2005	T4S1S-2 T4S1S-2 0 - 0.5 3/22/2005	T4S1S-3 T4S1S-3 0 - 0.5 3/22/2005	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
										Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Pesticides (µg/kg)												
delta-BHC	1.8 Ui	1.9 U	1.8 U	1.00 U	1.00 U	1.00 U	134 U	134 U	134 U	--	--	--
Heptachlor	2.8 Ui	1.9 U	1.8 U	1.00 U	1.00 U	1.00 U	67.0 U	67.0 U	67.0 U	450	4,000	45,000
Aldrin	1.8 U	1.9 U	1.8 U	1.00 U	1.00 U	1.00 U	67.0 U	67.0 U	67.0 U	130	1,100	13,000
gamma-Chlordane	2.1 Ui	1.9 Ui	1.8 U	0.418 J	1.00 U	1.00 U	67.0 U	134 U	67.0 U	7,400	61,000	740,000
Endosulfan I	1.8 U	1.9 U	1.8 U	1.00 U	1.00 U	1.00 U	67.0 U	67.0 U	67.0 U	4,900,000	1,600,000	16,000,000
alpha-Chlordane	1.8 Ui	1.9 U	1.8 U	0.334 J	1.00 U	1.00 U	67.0 U	67.0 U	67.0 U	7,400	61,000	740,000
Dieldrin	0.93 JP	1.9 U	1.8 U	0.353 J	2.00 U	2.00 U	134 U	134 U	134 U	140	1,200	14,000
4,4'-DDE	8.6 P	1.9 Ui	1.8 U	1.29 J	2.00 U	2.00 U	134 U	134 U	134 U	8,200	66,000	820,000
Endrin	4.1 Ui	1.9 U	1.8 U	2.00 U	2.00 U	2.00 U	134 U	134 U	134 U	250,000	80,000	800,000
4,4'-DDD	2.1 U	2.1 U	2.1 U	0.381 J	2.00 U	2.00 U	134 U	134 U	134 U	12,000	94,000	1,200,000
Endrin Aldehyde	6.5 Ui	1.9 U	1.8 U	2.00 U, J	2.00 U, J	2.00 U	134 U	134 U	134 U	--	--	--
4,4'-DDT	1.9 Ui	5.3 P	1.8 U	5.21 J	0.176 J	2.00 U	134 U	134 U	134 U	8,500	66,000	850,000
Endrin Ketone	5.6 Ui	1.9 U	1.8 U	2.00 U, J	2.00 U, J	2.00 U	134 U	134 U	134 U	--	--	--
Methoxychlor	2.2 U	2.2 U	2.2 U	2.00 U	2.00 U	2.00 U	134 U	134 U	134 U	--	--	--

Notes:

- Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
- µg/kg = Micrograms per kilogram.
- J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
- U = The compound was analyzed for but was not detected at or above the MRL/MDL.
- P = The GC or HPLC confirmation criterion was exceeded. The relative percent difference is greater than 40 percent between the two analytical results.
- i = The MRL/MDL was elevated due to a chromatographic interference.
- Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
- Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
- Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 12A
SOIL CHEMISTRY RESULTS: METALS

REMEDIATION INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-31	T4S1SB-32	T4S1SB-33	T4S1SB-89	T4S1SB-90	DEQ Clean Fill ¹¹	DEQ Risk-Based Concentrations ¹²		Hot Spot Levels
Sample ID:	T4S1SB-31-0-1	T4S1SB-32-0-1	T4S1SB-33-0-1	T4S1SB-89-0-1	T4S1SB-90-0-1	Background Concentrations - Portland Basin	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval (Note 10):	0.5 - 1.5	0.5 - 1.5	0.25 - 1	0.5 - 2.5	1 - 3				
Date Sampled:	9/8/2004	9/3/2004	9/3/2004	9/7/2005	9/7/2005				
Metals (mg/kg)									
Antimony	0.282 N	0.13 N	0.86 N	-- R	-- R	0.56	--	--	--
Arsenic	2.4	2.46	1.9	3.45	3.31	8.8	1.9	15	190
Beryllium	0.323	0.271	0.201	0.341 J	0.312 J	21	2,300	700	70,000
Cadmium	0.19	0.069	0.236	0.278 J	0.163 J	0.63	1,100	350	35,000
Chromium	21.1	15.3	25.9	30.9	13.9	76	>Max	530,000	5,300,000
Copper	19.4	13.8	14.7	16.7	12.7	34	47,000	14,000	140,000
Lead	38.9	2.9	28.6	14.2	3.42	28	800	800	8,000
Mercury	0.034	0.01 B	0.043	0.142 U	0.0243 J	0.23	350	110	1,100
Nickel	20.1	16.5	13.7	16.3	17.0	47	22,000	7,000	700,000
Selenium	0.2 B	0.2 B	0.2 B	0.534 J	0.386 J	0.71	--	--	--
Silver	0.053	0.024	0.033	0.568 U	0.465 U	4.2	5,800	1,800	18,000
Thallium	0.064	0.047	0.06	0.568 U	0.465 U	5.2	--	--	--
Zinc	110	53.6	102	123	48.0	180	--	--	--

Notes:

- All analytes are reported in the table.
- Metals using EPA 6000-7000 Series Methods.
- mg/kg = Milligrams per kilogram.
- PRG = EPA Region 9 Preliminary Remediation Goal (PRG) for Industrial Soil (October 2004).
- R = Data rejected as part of data quality review.
- U = The compound was analyzed for but was not detected at or above the MRL/MDL.
- B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
- N = The matrix spike sample recovery is not within control limits. The case narrative suggests that soil samples digested with EPA Method 3050 for Antimony should only be used as indicators to estimate concentrations.
- J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
- Depth range at time of sampling. Since sampling, approximately 3 feet of fill has been placed at the locations of the samples.
- Oregon Clean Fill Determinations, Oregon Department of Environmental Quality, July 23, 2014 (see <http://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>)
- Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
- Shading indicates detected concentrations exceed Background Concentrations and one or more DEQ Risk-Based Concentrations values.

Appendix D

Cesspool Area

Appendix D – Cesspool Area

D.1 Cesspool Area Description

Figure D is a site plan of the Cesspool Area including coordinates defining the area boundary. This area covers approximately 0.1 acres. Historical drawings identified cesspools in this area. Cesspools are disposal pits for untreated sewage, and these may have been lined with treated timbers. Soil below a depth of 13 feet below the ground surface contains total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Pesticides, polychlorinated biphenyls (PCBs), and metals were also detected above background levels. Because of the depth to the soil with TPH and PAHs, the current condition of this soil does not pose a risk to human health. Groundwater was found to meet acceptable risk levels. Figure D shows the sample locations. Tables in this Appendix D summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Ash Creek/Newfields, 2007).

D.2 Restrictions on Use of the Cesspool Area

There are no restrictions on the use of this area unless excavation of any type is conducted to a depth of 13 feet or greater.

D.3 Ongoing Remediation Activities in the Cesspool Area

There are no ongoing remediation activities in this area.

D.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix D.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;

- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

D.5 Soil Handling in the Cesspool Area

Until demonstrated otherwise (such as through characterization as described in Section D.7), soil from a depth of 13 feet or greater from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. That soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents¹ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section D.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of soil excavated from a depth of 13 feet or greater.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:

¹ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1² – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
- If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
- The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.³
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section D.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

D.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁴ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-

² The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

³ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

⁴ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

D.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁵ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, pesticides, PCBs, and metals. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, locations, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

⁵ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁶ Samples should be collected from the stored materials and analyzed for the chemicals identified in Method A above.

Soil should be stored in a stockpile or drop box managed in accordance with Section D.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material be characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums or excavation equipment.

D.8 Notification, Approvals, and Reporting

D.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

⁶ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

D.8.2 Reporting

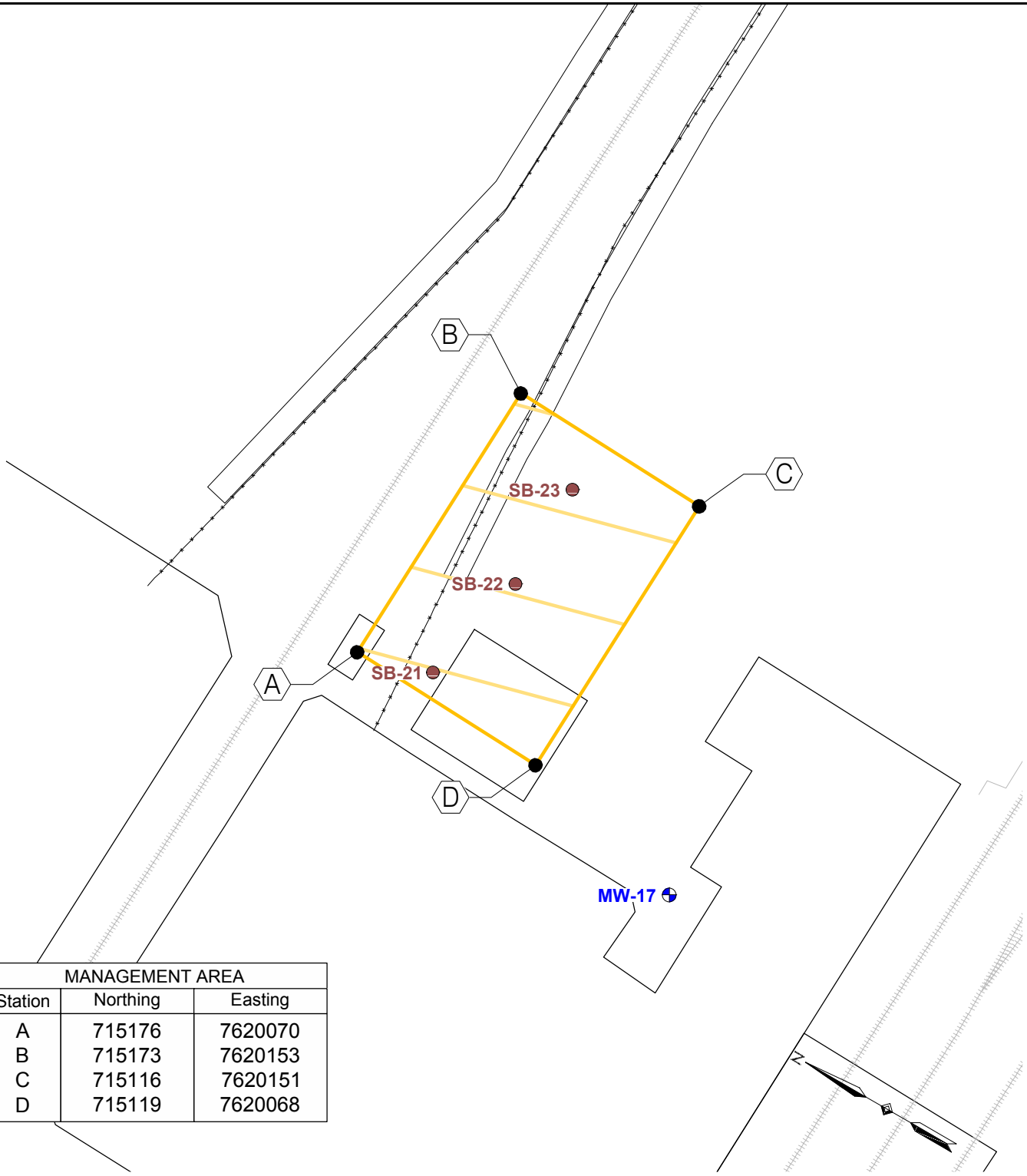
In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 2356. The report will be maintained in the Port Terminal 4 Slip 1 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

D.9 References

Ash Creek/Newfields, 2007. *Remedial Investigation Report*, Terminal 4 Slip 1 Upland Facility, Port of Portland, Portland, Oregon. August 2007.



MANAGEMENT AREA		
Station	Northing	Easting
A	715176	7620070
B	715173	7620153
C	715116	7620151
D	715119	7620068

Legend:

- MW-17**  Monitoring Well Location
- SB-21**  Soil Boring Location
-  Station Location

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.

Cesspool Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number **1066-10/
1007-21**

March 2019

Appendix

D

TABLE 12A
SOIL CHEMISTRY RESULTS: METALS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1SB-21 T4S1SB-21-13-1 12.5 - 14 9/2/2004	T4S1SB-22 T4S1SB-22-13-1 12.5 - 14 9/2/2004	T4S1SB-22 T4S1SB-22-17-1 16.5 - 17 9/2/2004	T4S1SB-23 T4S1SB-23-13-1 12.5 - 14 9/2/2004	DEQ Clean Fill ⁶ Background Concentrations - Portland Basin	DEQ Risk-Based Concentrations ⁷		Hot Spot Levels
						Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Constructio n Worker
Metals (mg/kg)								
Antimony	0.14 N	0.09 N	2.41 N	1.15 N	0.56	--	--	--
Arsenic	1.63	2.2	6.71	4	8.8	1.9	15	190
Beryllium	0.645	0.332	0.346	0.483	21	2,300	700	70,000
Cadmium	0.106	0.091	7.87	1.24	0.63	1,100	350	35,000
Chromium	30.9	16.6	34.1	30.8	76	>Max	530,000	5,300,000
Copper	24.5	14.7	153	68.4	34	47,000	14,000	140,000
Lead	5.53 *	5.82 *	797	258 *	28	800	800	8,000
Mercury	0.02	0.03	1.53	0.21	0.23	350	110	1,100
Nickel	26.8	20.1	45.9	34.5	47	22,000	7,000	700,000
Selenium	0.4 B	0.2 B	1.3	0.4 B	0.71	--	--	--
Silver	0.055	0.024	1.7	0.578	4.2	5,800	1,800	18,000
Thallium	0.089	0.05	0.095	0.109	5.2	--	--	--
Zinc	65.9	65.1	2,490	533	180	--	--	--

Notes:

1. Metals using EPA 6000-7000 Series Methods.
2. mg/kg = Milligrams per kilogram.
3. B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
4. N = The matrix spike sample recovery is not within control limits. The case narrative suggests that soil samples digested with EPA Method 3050 for Antimony should only be used as indicators to estimate concentrations.
5. * = The laboratory duplicate analysis was not within control limits. The laboratory attributed the variability to the heterogeneous character of the sample.
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 6A
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-21	T4S1SB-22	T4S1SB-22	T4S1SB-23	DEQ Risk-Based Concentrations ¹⁰		Hot Spot Levels
Sample ID:	T4S1SB-21-13-1	T4S1SB-22-13-1	T4S1SB-22-17-1	T4S1SB-23-13-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	12.5 - 14	12.5 - 14	16.5 - 17	12.5 - 14			
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/2/2004			
TPH (mg/kg)							
Gasoline Range	--	--	100 Z	--	20,000	9,700	97,000
Diesel Range	15 J	20 U	4,700 H	1,100 H	14,000	4,600	46,000
Residual Range	17 J	79 U	16,000 DO	2,800 O	14,000	4,600	46,000

Notes:

1. TPH = Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH). Diesel and residual range performed with silica gel cleanup.
2. mg/kg = Milligrams per kilogram.
3. -- = Not analyzed.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. H = The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
6. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
7. D = Dilution.
8. Z = The chromatographic fingerprint does not resemble a petroleum product.
9. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
10. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
11. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
12. Residual Range concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 7A

SOIL CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS

REMEDIAL INVESTIGATION

PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-21	T4S1SB-22	T4S1SB-22	T4S1SB-23	DEQ Risk-Based Concentrations ⁶		Hot Spot Levels
Sample ID:	T4S1SB-21-13-1	T4S1SB-22-13-1	T4S1SB-22-17-1	T4S1SB-23-13-1	Direct Soil Contact Occupational	Direct Soil Contact Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	12.5 - 14	12.5 - 14	16.5 - 17	12.5 - 14			
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/2/2004			
PAHs (µg/kg)							
Naphthalene	2 J	12	2,100 D	220	23,000	580,000	2,300,000
2-Methylnaphthalene	1.7 J	4.2 J	740 D	210	--	--	--
Acenaphthylene	0.3 J	18	2,700 D	350	--	--	--
Acenaphthene	3.9 U	1.1 J	1,200 D	290	70,000,000	21,000,000	210,000,000
Fluorene	0.33 J	7.6	3,500 D	630	47,000,000	14,000,000	140,000,000
Dibenzofuran	0.31 J	4.9 J	1,300 D	100	--	--	--
Phenanthrene	1.1 J	100	27,000 D	3,800 D	--	--	--
Anthracene	0.33 J	14	5,400 D	1,000	350,000,000	110,000,000	1,100,000,000
Fluoranthene	0.91 J	140	43,000 D	3,500 D	30,000,000	10,000,000	100,000,000
Pyrene	1.2 J	150	44,000 D	4,400 D	23,000,000	7,500,000	75,000,000
Benzo(b)fluoranthene	3.9 U	61	14,000 D	1,200	2,900	24,000	290,000
Benzo(k)fluoranthene	3.9 U	80	16,000 D	1,000	29,000	240,000	2,900,000
Benzo(a)anthracene	0.33 J	64	16,000 D	1,500	2,900	24,000	290,000
Chrysene	3.9 U	81	21,000 D	1,800	290,000	2,400,000	29,000,000
Benzo(a)pyrene	0.38 J	92	17,000 D	1,400	290	2,400	29,000
Indeno(1,2,3-cd)pyrene	0.37 J	63	12,000 D	1,000	2,900	24,000	290,000
Dibenz(a,h)anthracene	3.9 U	11	2,500 D	210	290	2,400	29,000
Benzo(g,h,i)perylene	0.49 J	60	11,000 D	950	--	--	--

Notes:

1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. D = Dilution.
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 9A
SOIL CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-21	T4S1SB-22	T4S1SB-22	T4S1SB-23	DEQ Risk-Based Concentrations ⁶		Hot Spot Levels
Sample ID:	T4S1SB-21-13-1	T4S1SB-22-13-1	T4S1SB-22-17-1	T4S1SB-23-13-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	12.5 - 14	12.5 - 14	16.5 - 17	12.5 - 14			
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/2/2004			
VOCs (µg/kg)							
Acetone	45	20 J	790	210	--	--	--
Carbon Disulfide	6.6 U	5.2 U	7.3 J	3 J	--	--	--
Dichloromethane (Methylene Chloride)	3.5 J	32	33	11 J	--	--	--
2-Butanone (MEK)	27 U	21 U	160	43	--	--	--
Chloroform	6.6 U	1.3 J	14 U	8.8 U	26,000	410,000	2,600,000
Carbon Tetrachloride	6.6 U	1.1 J	14 U	8.8 U	34,000	320,000	3,400,000
Benzene	6.6 U	5.2 U	14 U	8.8 U	37,000	380,000	3,700,000
Trichloroethene (TCE)	6.6 U	0.81 J	14 U	8.8 U	51,000	470,000	5,100,000
Toluene	6.6 U	5.2 U	14 U	8.8 U	88,000,000	28,000,000	280,000
Tetrachloroethene (PCE)	6.6 U	5.2 U	14 U	8.8 U	1,000,000	1,800,000	100,000,000
Chlorobenzene	6.6 U	5.2 U	14 U	500	8,700,000	4,700,000	47,000,000
Ethylbenzene	6.6 U	5.2 U	14 U	8.8 U	150,000	1,700,000	15,000,000
m,p-Xylenes	6.6 U	5.2 U	14 U	8.8 U	25,000,000	20,000,000	200,000,000
o-Xylene	6.6 U	5.2 U	14 U	8.8 U			
Isopropylbenzene	27 U	21 U	53 U	35 U	57,000,000	27,000,000	270,000,000
n-Propylbenzene	27 U	21 U	53 U	35 U	--	--	--
1,2,3-Trichlorobenzene	1.2 U	1.1 U	2.4 U	1.7 U	--	--	--
1,3,5-Trimethylbenzene	27 U	21 U	53 U	35 U	12,000,000	3,500,000	35,000,000
1,2,4-Trimethylbenzene	27 U	21 U	2.9 J	35 U	2,000,000	2,000,000	20,000,000
sec-Butylbenzene	27 U	21 U	53 U	35 U	--	--	--
4-Isopropyltoluene	27 U	21 U	53 U	35 U	--	--	--
1,4-Dichlorobenzene	6.6 U	5.2 U	14 U	290	64,000	1,300,000	6,400,000
n-Butylbenzene	27 U	21 U	53 U	35 U	--	--	--
Hexachlorobutadiene	27 U	21 U	53 U	35 U	--	--	--
Naphthalene	27 U	21 U	53 U	35 U	23,000	580,000	23,000,000

Notes:

1. Only detected compounds are reported in the table.
2. VOCs = Volatile Organic Compounds by EPA Method 8260B.
3. µg/kg = Micrograms per kilogram.
4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 10A
SOIL CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-21	T4S1SB-22	T4S1SB-22	T4S1SB-23	DEQ Risk-Based Concentrations ⁸		Hot Spot Levels
Sample ID:	T4S1SB-21-13-1	T4S1SB-22-13-1	T4S1SB-22-17-1	T4S1SB-23-13-1	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	12.5 - 14	12.5 - 14	16.5 - 17	12.5 - 14			
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/2/2004			
PCBs (mg/kg)							
Aroclor 1254	0.045 U	0.04 U	0.089 Ui	0.06 Ui	--	--	--
Aroclor 1260	0.045 U	0.04 U	0.10	0.06 Ui	--	--	--
Aroclor 1262	0.045 U	0.04 U	--	0.047 J	--	--	--
Aroclor 1268	0.045 U	0.04 U	--	0.03 J	--	--	--
Total PCBs	--	--	0.10	0.077	0.59	4.9	59

Notes:

1. Only detected compounds are reported in the table.
2. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
3. mg/kg = Milligrams per kilogram.
4. -- = Not analyzed.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. i = The MRL/MDL was elevated due to a chromatographic interference.
8. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
9. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 11A
SOIL CHEMISTRY RESULTS: PESTICIDES

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-21	T4S1SB-22	T4S1SB-22	T4S1SB-23	DEQ Risk-Based Concentrations ⁸		Hot Spot Levels
Sample ID:	T4S1SB-21-13-1	T4S1SB-22-13-1	T4S1SB-22-17-1	T4S1SB-23-13-1	Direct Soil Contact	Direct Soil Contact	Direct Soil Contact -
Sample Interval:	12.5 - 14	12.5 - 14	16.5 - 17	12.5 - 14	Occupational	Construction	Occupational/Construction
Date Sampled:	9/2/2004	9/2/2004	9/2/2004	9/2/2004	Worker	Worker	Worker
Pesticides (µg/kg)							
delta-BHC	2.3 U	2 U	8.4	3 Ui	--	--	--
Heptachlor	2.3 U	2 U	6.9 Ui	3 U	450	4,000	45,000
Aldrin	2.3 U	2 U	4.5 U	1.5 JP	130	1,100	13,000
gamma-Chlordane	2.3 U	2 U	4.5 U	3.1 Ui	7,400	61,000	740,000
Endosulfan I	2.3 U	2 U	4.9	3 U	4,900,000	1,600,000	16,000,000
alpha-Chlordane	2.3 U	2 U	4.5 Ui	3 Ui	7,400	61,000	740,000
Dieldrin	2.3 U	2 U	4.5 U	3 U	140	1,200	14,000
4,4'-DDE	2.3 U	2 U	6.9 Ui	54 P	8,200	66,000	820,000
Endrin	2.3 U	2 U	4.9 Ui	3 U	250,000	80,000	800,000
4,4'-DDD	2.6 U	2.3 U	13 Ui	35	12,000	94,000	1,200,000
Endrin Aldehyde	2.3 U	2 U	13 Ui	3 Ui	--	--	--
4,4'-DDT	2.3 U	2 U	14 Ui	2.2 JP	8,500	66,000	850,000
Endrin Ketone	2.3 U	2 U	7.3 P	3 Ui	--	--	--
Methoxychlor	2.7 U	2.4 U	5.4 U	3.6 U	--	--	--

Notes:

1. Only detected compounds are reported in the table.
2. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
3. µg/kg = Micrograms per kilogram.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. P = The GC or HPLC confirmation criterion was exceeded. The relative percent difference is greater than 40 percent between the two analytical results.
6. i = The MRL/MDL was elevated due to a chromatographic interference.
7. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
8. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
9. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

Appendix E

Wheeler Bay Bank

Appendix E – Wheeler Bay Bank

E.1 Wheeler Bay Bank Description

Figure E is a site plan of the Wheeler Bay Bank including coordinates defining the area boundary Appendix E. This area covers approximately 0.7 acres. Prior to 2008, soil on the Wheeler Bay riverbank was subject to erosion into the river. That soil contained PAHs, pesticides, and metals at concentrations that posed a risk to environmental receptors living in the sediments or water. Total petroleum hydrocarbons as heavy oil (TPH-Dx) were also detected. Five samples exceeded the Portland Harbor Riverbank/Sediment screening level for DDX and nine samples exceeded for metals (one or more of arsenic, cadmium, mercury, or zinc). Groundwater was found to meet acceptable risk levels. A source control action was completed for the Wheeler Bay Bank (Ash Creek, 2009). In general, the source control action included soil removal, flattening of the riverbank, and stabilization of the surface soil with rip rap, topsoil, and vegetation. Soil with chemicals remains in place below a depth of 1 to 2 feet beneath the surface of the stabilized riverbank. Figure E shows the sample locations. Tables in this Appendix E summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Ash Creek/Newfields, 2007).

In June 2010, high river levels (approximately 15.5 feet NGVD) coupled with higher than anticipated vessel-induced waves caused erosion of the western 275 feet of the Wheeler Bay shoreline stabilization area. The area was repaired by placing additional armor on top of the existing armor, anchoring large woody debris parallel to the shoreline, and placing additional plantings above the armor protection between 0 and 275 feet from the mouth of the bay (Anchor QEA, 2011).

In late June and early July 2011, The Willamette River reached approximately elevation 18.7 feet NGVD, and the water level remained above the ordinary high water elevation (16.6 feet NGVD) for over 4 weeks. For the most part, the Wheeler Bay shoreline stabilization area functioned as intended. However, there were three small areas of erosion noted during the monitoring event. The erosion areas were repaired by placing additional armor rock and sand/gravel fill (Anchor QEA, 2012).

Monitoring conducted in July 2017 identified two areas of minor erosion. These areas were sampled and the results are pending. If the surface soil sample chemistry results are below criteria, the Port will continue to visually monitor the erosion areas as part of the regular monitoring activities at Wheeler Bay. If the chemistry results are above criteria, the Port will evaluate and implement repairs (Anchor QEA, 2017).

E.2 Restrictions on Use of the Wheeler Bay Bank

Vegetation and soil may not be disturbed in this area without prior approval of Port Environmental.

The source control action includes institutional controls as follows:

- Regulated Navigation Areas – A regulated navigation area (RNA) was requested from the United States Coast Guard for the Wheeler Bay cap area including the Wheeler Bay bank. Specific activities that are limited include anchoring, dragging, trawling, or other activities that may disrupt the function or affect the integrity of the cap (such as prop scour and/or vessel transit limitations of capped areas at flood stage).
- Update the Terminal 4 Base-map – The location of the capped area will be placed on the electronic T4 base-map to alert personnel conducting future construction activities of the capped area. Additionally, a statement requiring coordination with the Port's Marine Environmental department prior to conducting any construction activities within the footprint of the capped area will also be placed on the base-map. For any engineering design or construction work to be performed at a Port terminal, the design work would start from the base-map. The Port's CAD manager is responsible for maintaining the base-map or the official record of the Port's assets and situation at T4. As such, the base-map is the one appropriate place to secure geographic information that will be available and known for future construction activities.
- Notification to Port Tenants – As appropriate, written notification will be given to the Port's tenants about the presence of the capped area. Additionally, lease language protecting the integrity of the capped area will be provided for any new tenants that occupy Port property at T4 to the extent the lease permits use of areas on, over, or in the direct vicinity of the capped area. Similar provisions will be implemented for existing tenants upon occurrence of lease expiration and renewal.

E.3 Ongoing Remediation Activities in the Wheeler Bay Bank

Except for periodic monitoring, there are no ongoing remediation activities in this area.

E.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix E.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;

- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

E.5 Soil Handling in the Wheeler Bay Bank

Until demonstrated otherwise (such as through characterization as described in Section E.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents¹ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section E.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:

¹ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project, restrictions imposed on that Management Area (e.g., bank stabilization requirements including the specific engineering requirements of the bank stabilization source control measure), and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
- Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1² – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
- If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include within 50 feet of either a storm drain or the top of the riverbank.
- The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.³
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section E.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

² The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

³ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

E.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁴ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

E.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁵ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, pesticides, and metals. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.

⁴ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁵ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁶ Samples should be collected from the stored materials and analyzed for the chemicals identified in Method A above.

Soil should be stored in a stockpile or drop box managed in accordance with Section E.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogenous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

E.8 Notification, Approvals, and Reporting

E.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a

⁶ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.

- For any other work, advance notice to DEQ is not required.

E.8.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 2356. The report will be maintained in the Port Terminal 4 Slip 1 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

E.9 References

Anchor QEA, LLC, 2011. Wheeler Bay Shoreline Stabilization Slope Repair Closure Report, Terminal 4 Phase I Removal Action. January 2011.

Anchor QEA, LLC, 2012. 2011 Wheeler Bay Shoreline Stabilization Slope Repair Closure Report, Terminal 4 Phase I Removal Action. May 2012.

Anchor QEA, LLC, 2017. Memorandum: *Status of Wheeler Bay Shoreline Stabilization and Proposed Surface Soil Sampling*. December 15, 2017.

Ash Creek/Newfields, 2007. *Remedial Investigation Report*, Terminal 4 Slip 1 Upland Facility, Port of Portland, Portland, Oregon. August 2007.

Ash Creek, 2009. Wheeler Bay Source Control Completion Report, Terminal 4 Slip 1 Upland Facility. September 2009.

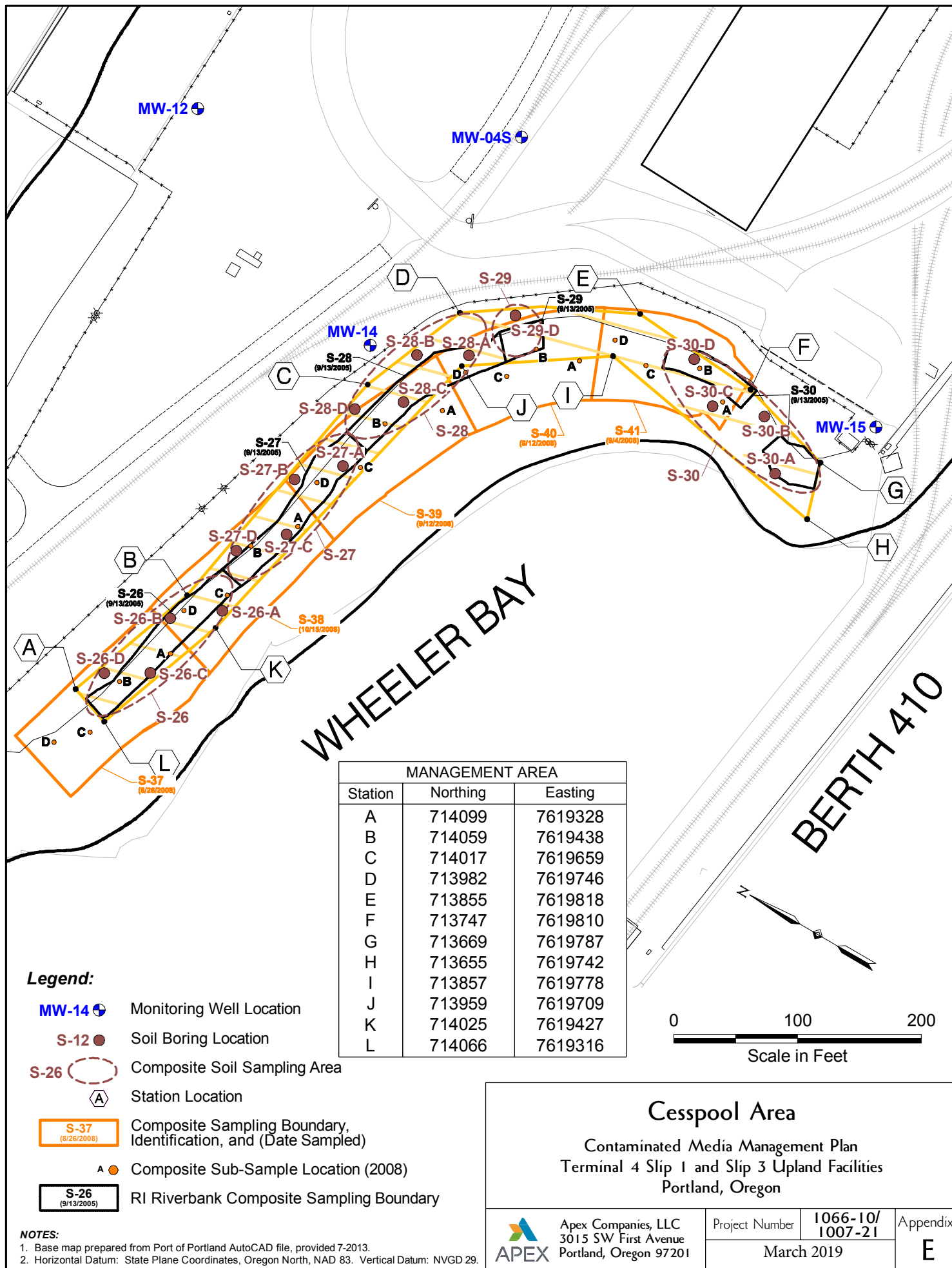


TABLE 6B
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	DEQ Risk-Based Concentrations ⁷		EPA ROD	Hot Spot Levels
Sample ID:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1				
Date Sampled:	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005				
TPH (mg/kg)									
Gasoline Range	--	--	--	--	--	20,000	9,700	--	97,000
Diesel Range	26.4 U	18.7 J, D	25.4 U	36.2 D	14.9 J, D	14,000	4,600	91	46,000
Residual Range	42.2 J, D	68.2 D	34.0 J, D	138 D	57.3 D	14,000	4,600	--	46,000

Notes:

1. TPH = Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH). Diesel and residual range performed with silica gel cleanup.
2. mg/kg = Milligrams per kilogram.
3. -- = Not analyzed.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. D = The reported result is from a dilution.
7. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
8. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
9. Residual Range concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

TABLE 6B
SOIL CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	S-37 T4S1S-26 Note 8 8/26/2008	S-38 T4S1S-26A Note 8 10/4/2008	S-39 T4S1S-26B Note 8 9/12/2008	S-40 T4S1S-26C Note 8 9/12/2008	S-41 T4S1S-26D Note 8 9/4/2008	T4S1S-27C T4S1S-27C 0 - 1 9/13/2005	T4S1S-27D T4S1S-27D 0 - 1 9/13/2005	T4S1S-28 T4S1S-28 0 - 1 9/13/2005	T4S1S-30D T4S1S-30D 0 - 1 9/13/2005	DEQ Risk-Based Concentrations ⁵		EPA ROD	Hot Spot Levels
										Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
PAHs (µg/kg)													
Naphthalene	163 U	30.6 U	171 U	144 U	149	54.7 U	54.5 U	28.3 J, D	6,480 D	23,000	580,000	--	2,300,000
Acenaphthylene	163 U	30.6 U	171 U	144 U	149 U	54.7 U	54.5 U	67.6 U	347 U	--	--	--	--
Acenaphthene	163 U	30.6 U	171 U	866	761	54.7 U	54.5 U	151 D	1,180 D	70,000,000	21,000,000	--	210,000,000
Fluorene	163 U	30.6 U	171 U	973	662	54.7 U	54.5 U	114 D	1,240 D	47,000,000	14,000,000	--	140,000,000
Phenanthrene	181	146	225	4,360	4,470	28.5 J, D	35.0 J, D	1,040 D	1,830 D	--	--	--	--
Anthracene	163 U	30.6 U	171 U	479	556	54.7 U	54.5 U	166 D	520 U	350,000,000	110,000,000	--	1,100,000,000
Fluoranthene	486	212	542	4,330	7,380	88.1 D	113 D	2,390 D	139 J, D	30,000,000	10,000,000	--	100,000,000
Pyrene	558	201	514	3,560	5,540	94.2 D	105 D	1,640 D	147 D	23,000,000	7,500,000	--	75,000,000
Benzo(b)fluoranthene	359	169	477	2,560	5,110	91.0 D	107 D	2,020 D	7.49 J, D	2,900	24,000	--	290,000
Benzo(k)fluoranthene	273	128	398	2,190	4,150	88.6 D	101 D	1,230 D	5.34 J, D	29,000	240,000	--	2,900,000
Benzo(a)anthracene	293	120	391	2,560	4,610	62.9 D	74.4 D	1,390 D	16.4 D	2,900	24,000	--	290,000
Chrysene	357	164	498	2,850	5,440	83.2 D	98.7 D	1,650 D	24.3 D	290,000	2,400,000	--	29,000,000
Benzo(a)pyrene	342	158	453	2,520	4,620	104 D	110 D	1,660 D	8.08 J, D	290	2,400	--	29,000
Indeno(1,2,3-cd)pyrene	231	114	318	1,710	2,770	60.6 D	61.4 D	1,130 D	13.9 U	2,900	24,000	--	290,000
Dibenz(a,h)anthracene	163 U	34.5	171 U	633	987	18.2 J, D	20.4 J, D	394 D	13.9 U	290	2,400	--	29,000
Benzo(g,h,i)perylene	278	141	372	1,780	2,860	74.4 D	68.3 D	1,240 D	13.9 U	--	--	--	--
Total PAHs	3,358	1,588	4,188	31,371	50,065	794	894	16,243	11,078	--	--	23,000	--
cPAHs (PaP Eq)	433	234	576	3861	6903	145	156	2522	11	--	--	12	--

Notes:

1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. D = Dilution.
6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
8. Bold Box indicates detected concentration exceeds the River Bank Soil/Sediment value.
9. Sample is a 4-point composite collected at a depth of 0-1 foot below finish subgrade of the Wheeler Bay Stabilization project.
The surface of the subgrade is delineated by a demarcation layer consisting of orange plastic mesh.
In general, the depth from finish grade to subgrade is 1 foot for two of the four composite subsamples and 2 feet for the other two composite subsamples.

TABLE 8B
SOIL CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS (EXCEPT PAHs)

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	DEQ Risk-Based Concentrations ⁵		EPA ROD	Hot Spot Levels
Sample ID:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1				
Date Sampled:	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005				
SVOCs (µg/kg)									
Phenol	--	--	--	--	--	--	--	--	--
Di-n-butyl Phthalate	27.9 U	27.0 U	27.2 U	54.8 U	27.7 U	--	--	--	--
Bis(2-ethylhexyl) Phthalate	27.9 U	27.0 U	27.2 U	54.8 U	27.7 U	160,000	1,300	0.135	13,000

Notes:

1. Only common compounds are reported in the table. Other SVOCs non-detect.
2. SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270C.
3. µg/kg = Micrograms per kilogram.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
6. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 10B
SOIL CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	DEQ Risk-Based Concentrations ⁵		EPA ROD	Hot Spot Levels
Sample ID:	T4S1S-26	T4S1S-27	T4S1S-28	T4S1S-29	T4S1S-30	Direct Soil Contact Occupational	Direct Soil Contact Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1				
Date Sampled:	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005				
PCBs (mg/kg)								--	
Aroclor 1254	0.0516 U	0.0335 U	0.0335 U	0.0845 U	0.0343 U	--	--	--	--
Aroclor 1260	0.0344 U	0.0335 U	0.0335 U	0.0338 U	0.0343 U	--	--	--	--
Total PCBs	--	--	--	--	--	0.59	4.9	0.009	59

Notes:

1. Only common compounds are reported in the table. Other SVOCs non-detect.
2. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
3. mg/kg = Milligrams per kilogram.
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
6. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

TABLE 11B
SOIL CHEMISTRY RESULTS: PESTICIDES

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-26	T4S1S-26A	T4S1S-26B	T4S1S-26C	T4S1S-26D	T4S1S-27	T4S1S-27A	T4S1S-27B	T4S1S-27C	T4S1S-27D	DEQ Risk-Based Concentrations ⁶		EPA ROD	Hot Spot Levels
	T4S1S-26	T4S1S-26A	T4S1S-26B	T4S1S-26C	T4S1S-26D	T4S1S-27	T4S1S-27A	T4S1S-27B	T4S1S-27C	T4S1S-27D	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soi/Sediment	Direct Soil Contact - Occupational/Construction Worker
	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005				
Pesticides (µg/kg)														
delta-BHC	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	--	--		--
Heptachlor	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	450	4,000		45,000
Heptachlor Epoxide	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	240	2,000		24,000
Aldrin	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	130	1,100	2	13,000
gamma-Chlordane	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	7,400	61,000	1.4	740,000
Endosulfan I	1.04 U, D	1.37 U	6.87 U	1.39 U	7.70 U	1.02 U, D	6.78 U	1.35 U	1.37 U	1.37 U	4,900,000	1,600,000		16,000,000
alpha-Chlordane	1.04 U, D	1.37 U	6.87 U	1.39 U	77.0 U	1.02 U, D	67.8 U	1.35 U	1.37 U	1.37 U	7,400	61,000	1.4	740,000
Dieldrin	0.761 J, D	1.37 U	68.7 U	1.39 U	77.0 U	2.04 U, D	67.8 U	1.35 U	1.37 U	1.37 U	140	1,200	0.07	14,000
4,4'-DDE	5.22 D	1.37 U	68.7 U	1.39 U	77.0 U	1.83 J, D	6.78 U	1.35 U	1.37 U	1.37 U	8,200	66,000	226	820,000
Endrin	2.09 U, D	1.37 U	6.87 U	1.39 U	7.70 U	2.04 U, D	67.8 U	1.35 U	1.37 U	1.37 U	250,000	80,000		800,000
4,4'-DDD	2.37 D	1.37 U	6.87 U	1.39 U	7.70 U	2.04 U, D	6.78 U	1.35 U	0.873 J, D	1.37 U	12,000	94,000	114	1,200,000
Endrin Aldehyde	2.09 U, D	1.37 U	6.87 U	1.39 U	77.0 U	2.04 U, D	67.8 U	1.35 U	1.37 U	1.37 U	--	--		--
4,4'-DDT	17.20 D	1.37 U, D	6.87 U	1.11 J, D	96.8 D	3.66 D	67.8 U	1.35 U, D	1.37 U, D	1.37 U, D	8,500	66,000	246	850,000
Endrin Ketone	2.09 U, D	1.37 U	6.87 U	1.39 U	77.0 U	2.04 U, D	67.8 U	1.35 U	1.37 U	1.37 U	--	--		--
Methoxychlor	2.09 U, D	1.37 U	68.7 U	1.39 U	77.0 U	2.04 U, D	67.8 U	1.35 U	1.37 U	1.37 U	--	--		--
DDx	24.8	nd	nd	1.11	96.8	5.49	nd	nd	0.873	nd	--	--	6.1	--

Sample Location: Sample ID: Sample Interval: Date Sampled:	T4S1S-28	T4S1S-28A	T4S1S-28B	T4S1S-28C	T4S1S-28D	T4S1S-29	T4S1S-30	T4S1S-30A	T4S1S-30C	T4S1S-30D	DEQ Risk-Based Concentrations ⁶		EPA ROD	Hot Spot Levels
	T4S1S-28	T4S1S-28A	T4S1S-28B	T4S1S-28C	T4S1S-28D	T4S1S-29	T4S1S-30	T4S1S-30A	T4S1S-30C	T4S1S-30D	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soi/Sediment	Direct Soil Contact - Occupational/Construction Worker
	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005	0 - 1 9/13/2005				
Pesticides (µg/kg)														
delta-BHC	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	--	--		--
Heptachlor	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	450	4,000		45,000
Heptachlor Epoxide	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	0.190 J, D	1.03 U	1.01 U	1.04 U	240	2,000		24,000
Aldrin	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	130	1,100	2	13,000
gamma-Chlordane	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	7,400	61,000	1.4	740,000
Endosulfan I	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	4,900,000	1,600,000		16,000,000
alpha-Chlordane	1.01 U, D	1.03 U	1.02 U	1.02 U	1.01 U	1.03 U, D	1.03 U, D	1.03 U	1.01 U	1.04 U	7,400	61,000	1.4	740,000
Dieldrin	2.03 U, D	2.06 U	0.274 J	2.05 U	0.808 J	2.06 U, D	0.397 J, D	0.896 J	2.02 U	0.381 J	140	1,200	0.07	14,000
4,4'-DDE	1.72 J, D	2.06 U	2.04 U	2.05 U	1.61 J	7.84 D	2.05 U, D	2.06 U	2.02 U	2.07 U	8,200	66,000	226	820,000
Endrin	2.03 U, D	2.06 U	2.04 U	2.05 U	2.01 U	2.06 U, D	2.05 U, D	2.06 U	2.02 U	2.07 U	250,000	80,000		800,000
4,4'-DDD	2.03 U, D	2.06 U	2.04 U	2.05 U	0.654 J	2.79 D	2.05 U, D	2.06 U	2.02 U	2.07 U	12,000	94,000	114	1,200,000
Endrin Aldehyde	2.03 U, D	2.06 U	2.04 U	2.05 U	2.01 U	2.06 U, D	2.05 U, D	2.06 U	2.02 U	2.07 U	--	--		--
4,4'-DDT	3.43 D	3.72	0.648 J	0.925 J	4.66	15.9 D	1.66 J, D	2.50	1.54 J	1.35 J	8,500	66,000	246	850,000
Endrin Ketone	2.03 U, D	2.06 U	2.04 U	2.05 U	2.01 U	2.06 U, D	2.05 U, D	2.06 U	2.02 U	2.07 U	--	--		--
Methoxychlor	2.03 U, D	2.06 U	2.04 U	2.05 U	2.01 U	2.06 U, D	2.05 U, D	2.06 U	2.02 U	2.07 U	--	--		--
DDx	5.15	3.72	0.65	0.93	6.92	26.5	1.66	2.50	1.54	1.35	--	--	6.1	--

Sample Location: Sample ID: Sample Interval: Date Sampled:	S-37	S-38	S-39	S-40	S-41	DEQ Risk-Based Concentrations ⁶		EPA ROD	Hot Spot Levels
	K2406699-003 Note 8	K2406699-003 Note 8	K2406699-003 Note 8	K2406699-003 Note 8	K2406699-003 Note 8	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soi/Sediment	River Bank Soi/Sediment
	8/26/2008	10/4/2008	9/12/2008	9/12/2008	9/4/2008				
Pesticides (µg/kg)									
delta-BHC	--	--	--	--	--	--	--		--
Heptachlor	--	--	--	--	--	450	4000		45,000
Heptachlor Epoxide	--	--	--	--	--	240	2000		24,000
Aldrin	--	--	--	--	--	130	1,100	2	13,000
gamma-Chlordane	--	--	--	--	--	7400.00	61000.00	1.4	740,000
Endosulfan I	--	--	--	--	--	4900000	1,600,000		16,000,000
alpha-Chlordane	--	--	--	--	--	7400.00	61000.00	1.4	740,000
Dieldrin	--	--	--	--	--	140	1,200	0.07	14,000
4,4'-DDE	--	--	--	--	--	8200	66,000	226	820,000
Endrin	--	--	--	--	--	250000	80,000		800,000
4,4'-DDD	--	--	--	--	--	12000	94,000	114	1,200,000
Endrin Aldehyde	--	--	--	--	--	--	--		--
4,4'-DDT	101	7.61 U	8.65 U	12.3	20.4	8500	66,000	246	850,000
Endrin Ketone	--	--	--	--	--	--	--		--
Methoxychlor	--	--	--	--	--	--	--		--
DDx	101	nd	nd	12.3	20.4	--	--	6.1	--

Notes:

1. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.

2. µg/kg = Micrograms per kilogram.

3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).

4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

5. D = Dilution.

6. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).

7. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

8. Bold Box indicates detected concentration exceeds the River Bank Soil/Sediment value.

9. Sample is a 4-point composite collected at a depth of 0-1 foot below finish subgrade of the Wheeler Bay Stabilization project. The surface of the subgrade is delineated by a demarcation layer consisting of orange plastic mesh. In general, the depth from finish grade to subgrade is 1 foot for two of the four composite subsamples and 2 feet for the other two composite subsamples.

TABLE 12B
SOIL CHEMISTRY RESULTS: METALS

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1S-26	T4S1S-26A	T4S1S-26B	T4S1S-26C	T4S1S-26D	T4S1S-27	T4S1S-28	DEQ Clean Fill ⁵	DEQ Risk-Based Concentrations ⁶		EPA ROD	Hot Spot Levels
Sample ID:	T4S1S-26	T4S1S-26A	T4S1S-26B	T4S1S-26C	T4S1S-26D	T4S1S-27	T4S1S-28	Background Concentrations - Portland Basin	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1					
Date Sampled:	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005	9/13/2005					
Metals (mg/kg)												
Antimony	0.0728 J	1.53 U	1.53 U	1.54 U	1.74 U	1.53 U	1.53 U	0.56	--	--		--
Arsenic	10.9	2.49	2.23	2.97	15.7	2.59	3.72	8.8	1.9	15	3	190
Beryllium	0.260 J	0.209 J	0.285 J	0.277 J	0.186 J	0.295 J	0.316 J	21	2,300	700		70,000
Cadmium	7.02	0.220 J	0.270 J	0.646	25.3	0.402 J	0.815	0.63	1,100	350	0.51	35,000
Chromium	16.4	12.3	14.5	15.2	23.6	16.0	16.6	76	>Max	530,000		5,300,000
Copper	78.1	12.0	14.0	16.9	219 D	16.7	19.5	34	47,000	14,000	359	140,000
Lead	479 D	7.78	12.6	43.6	868 D	30.4	88.8	28	800	800	196	8,000
Mercury	0.0947 J	0.126 U, D	0.131 U, D	0.130 U, D	0.325 D	0.102 U	0.0261 J, D	0.23	350	110	0.085	1,100
Nickel	18.4	16.2	16.6	17.5	19.3	19.5	19.0	47	22,000	7,000		700,000
Selenium	0.286 J	0.184 J	0.163 J	0.159 J	0.407 J	0.229 J	0.295 J	0.71	--	--		--
Silver	1.16	0.511 U	0.509 U	0.123 J	2.10	0.509 U	0.0967 J	4.2	5,800	1,800		18,000
Thallium	0.0624 J	0.511 U	0.509 U	0.513 U	0.122 J	0.509 U	0.509 U	5.2	--	--		--
Zinc	949 D	55.7	64.0	127	3,320 D	112	181	180	--	--	459	--

Sample Location:	T4S1S-29D	T4S1S-30	S-38	S-39	S-40	S-41	DEQ Clean Fill ⁵	DEQ Risk-Based Concentrations ⁶		EPA ROD	Hot Spot Levels
Sample ID:	T4S1S-29	T4S1S-30	K2406699-003	K2406699-003	K2406699-003	K2406699-003	Background Concentrations - Portland Basin	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	River Bank Soil/Sediment	Direct Soil Contact - Occupational/Construction Worker
Sample Interval:	0 - 1	0 - 1	Note 6	Note 6	Note 6	Note 6					
Date Sampled:	9/13/2005	9/13/2005	10/4/2008	9/12/2008	9/12/2008	9/4/2008					
Metals (mg/kg)											
Antimony	1.51 U, D	1.53 U, D	--	--	--	--	0.56	--	--		--
Arsenic	14.5 D	2.47 D	4.44	3.95	5.02	4.78	8.8	1.9	15	3	190
Beryllium	0.292 J, D	0.352 J, D	--	--	--	--	21	2,300	700		70,000
Cadmium	2.12 D	0.352 J, D	0.545 U	0.637 U	0.742	0.998	0.63	1,100	350	0.51	35,000
Chromium	23.8 D	16.8 D	--	--	--	--	76	>Max	530,000		5,300,000
Copper	38.5 D	17 D	17.3	15.5	17.7	24.9	34	47,000	14,000	359	140,000
Lead	276 D	41.8 D	32.8	54.7	118	117	28	800	800	196	8,000
Mercury	0.0799 J, D	0.0340 J, D	--	--	--	--	0.23	350	110	0.085	1,100
Nickel	17.7 D	20.5 D	--	--	--	--	47	22,000	7,000		700,000
Selenium	0.347 J, D	0.25 J, D	--	--	--	--	0.71	--	--		--
Silver	0.6600 D	0.510 U, D	--	--	--	--	4.2	5,800	1,800		18,000
Thallium	0.504 U, D	0.510 U, D	--	--	--	--	5.2	--	--		--
Zinc	328 D	91.4 D	93.7	90.8	163	190	180	--	--	459	--

Notes:

1. Metals using EPA 6000-7000 Series Methods.
2. mg/kg = Milligrams per kilogram.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. D = Dilution.
6. Sample is a 4-point composite collected at a depth of 0-1 foot below finish subgrade of the Wheeler Bay Stabilization project.
The surface of the subgrade is delineated by a demarcation layer consisting of orange plastic mesh.
In general, the depth from finish grade to subgrade is 1 foot for two of the four composite subsamples and 2 feet for the other two composite subsamples.
7. Shading indicates detected concentrations exceed background and one or more DEQ Risk-Based Concentrations values.
8. Bold Box indicates detected concentration exceeds the River Bank Soil/Sediment value.

Appendix F

Former Pipeline Release Area

Appendix F – Former Pipeline Release Area

F.1 Former Pipeline Release Area Description

Figure F is a site plan of the Former Pipeline Release Area including coordinates defining the area boundary. This area covers approximately 6 acres. This area corresponds to the location of a historical pipeline and associated releases that extended from the waterfront on the Willamette River to bulk storage tanks east of Terminal 4. Soil between depths of approximately 4 and 27 feet contains petroleum hydrocarbons including total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAHs). Two samples at depths of 13 to 16 feet contained TPH exceeding hot spot levels. This Management Area is within the Groundwater Management Area and petroleum hydrocarbons are also found both as floating separate-phase liquid and dissolved in groundwater (the groundwater management area is further outlined in Appendix J). Figure F shows the sample locations. Tables in this Appendix F summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Hart Crowser, 2000).

A remedial action was conducted at the head of Slip 3 to prevent migration of liquid hydrocarbons on groundwater to surface water in the slip (referred to as the “Bank Excavation and Backfill Remedial Action” or BEBRA; BBL/Ash Creek/Newfields, 2005). The BEBRA included the installation of a wide trench containing an engineered adsorptive soil mix to capture liquid hydrocarbons. The figure in Appendix F shows the location of the BEBRA. In 2008, during early action sediment cleanup in Slip 3, additional materials were added to the riverbank at the location of the BEBRA to supplement the adsorptive soil mix (Anchor, 2009).

Because of the prior completed removal actions and the depth to the soil/groundwater that contain petroleum hydrocarbons, the current condition of the soil/groundwater does not pose a risk to human health or the river. However, if exposed (for example during site redevelopment), soil and groundwater with residual hydrocarbons would need to be managed in accordance with this CMMP.

F.2 Restrictions on Use of the Former Pipeline Release Area

There are no restrictions on the use of this area with the following exceptions:

- Excavation of any type to a depth of 4 feet or greater requires implementation of this CMMP (as detailed in this Appendix F).
- If groundwater is encountered within the groundwater Management Area, implement the requirements of this CMMP (see Appendix J).
- The Former Pipeline Release Area overlaps the Former Quaker State Area and the South Slip Area. These areas carry restrictions associated with work at depths shallower than 4 feet. For work in these areas, see requirements in Appendix H (Former Quaker State Area) or Appendix I (South Slip Area).

F.3 Ongoing Remediation Activities in the Former Pipeline Release Area

Ongoing activities within this area are associated with the Groundwater Management Area. These activities include groundwater monitoring and manual removal of liquid hydrocarbons from monitoring wells (see Appendix J).

F.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix F.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

F.5 Soil Handling in the Former Pipeline Release Area

Until demonstrated otherwise (such as through characterization as described in Section F.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in

accordance with the project contract documents¹ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section F.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use (see Table 1)² and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use – (see Table 1) – soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil

¹ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

² The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.

- The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.³
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section F.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

F.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁴ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

F.7 Characterization of Soil

Existing data presented in this appendix could be used to characterize soil within this Management Area. However, the data are old (on the order of 20 years or older) and the area is relatively large. Natural degradation and variability within the area raises the potential that petroleum hydrocarbons may not be present in specific areas where future projects may be implemented. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs

³ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

⁴ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

of the project, the implementing party will select the most appropriate method or methods.⁵ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH and PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁶ Samples should be collected from the stored materials and analyzed for TPH and PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

⁵ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

⁶ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

Soil should be stored in a stockpile or drop box managed in accordance with Section F.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

F.8 Groundwater Handling in the Former Pipeline Release Area

The Former Pipeline Release Area is located within the Groundwater Management Area. See Appendix J for groundwater handling requirements in this area.

F.9 Notification, Approvals, and Reporting

F.9.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

F.9.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers

relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 272. The report will be maintained in the Port Terminal 4 Slip 3 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

F.10 References

Anchor, 2009. Final Removal Action Completion Report: Terminal 4 Phase I Removal Action. Prepared for the Port of Portland by Anchor QEA. June 2009.

BBL/Ash Creek/Newfields, 2005. Construction Completion Report, Bank Excavation and Backfill Remedial Action. March 1, 2005.

Hart Crowser, 2000. *Remedial Investigation Report*, Terminal 4, Slip 3 Upland, Port of Portland, Portland, Oregon. January 21, 2000.

Site Exploration Plan: Detailed View
Port of Portland, Terminal 4 - Slip 3 Upland

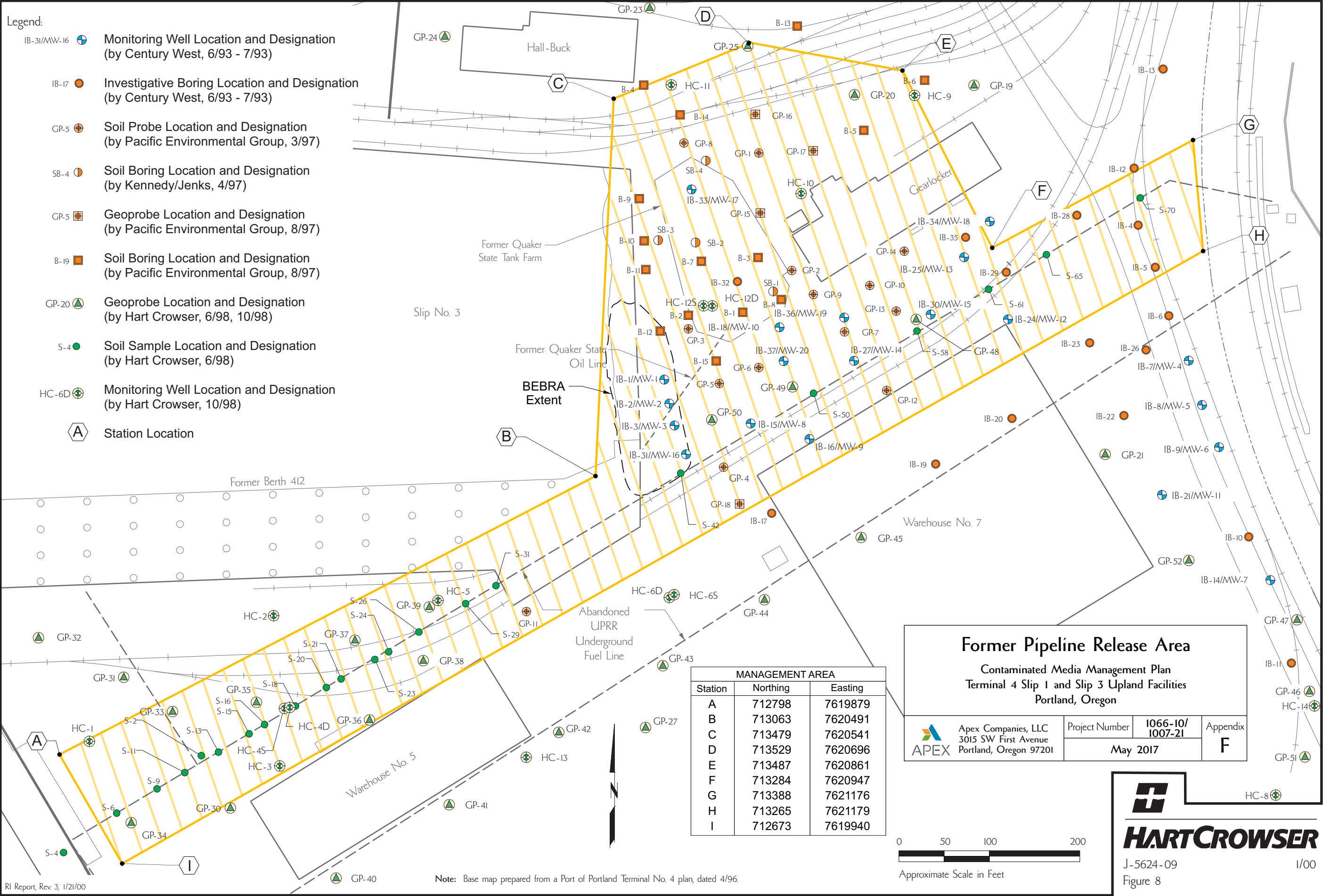


**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
IB-1-15.0	20-Jan-93	15.0	--	--	--	--	73 ^a	--	--
IB-1-19.0	20-Jan-93	19.0	<20	>50	ND	--	29,000	--	--
IB-1-21.0	20-Jan-93	21.0	--	--	--	--	<20	--	--
IB-1-31.0	20-Jan-93	31.0	--	--	--	--	<20	--	--
IB-2-13.0	20-Jan-93	13.0	--	--	--	--	<20	--	--
IB-2-17.5	20-Jan-93	17.5	<20	>50	ND	--	9,300	--	--
IB-2-23.0	20-Jan-93	23.0	--	--	--	--	26 ^a	--	--
IB-2-33.0	20-Jan-93	33.0	--	--	--	--	<20	--	--
IB-3-15.0	20-Jan-93	15.0	--	--	--	--	<20	--	--
IB-3-18.0	20-Jan-93	18.0	<20	>50	ND	--	15,000	--	--
IB-3-26.0	20-Jan-93	26.0	--	--	--	--	<20	--	--
IB-3-30.0	20-Jan-93	30.0	--	--	--	--	<20	--	--
IB-4-12.5	14-Jun-93	12.5	<20	<50	ND	--	--	--	--
IB-4-17.5	14-Jun-93	17.5	<20	<50	ND	--	--	--	--
IB-4-29.5	14-Jun-93	29.5	<20	<50	ND	--	--	--	--
IB-5-13.0	14-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-5-23.5	14-Jun-93	23.5	<20	<50	ND	--	--	--	--
IB-5-26.5	14-Jun-93	26.5	<20	<50	ND	--	--	--	--
IB-6-13.0	14-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-6-17.5	14-Jun-93	17.5	<20	<50	ND	--	--	--	--
IB-6-29.5	14-Jun-93	29.5	<20	<50	ND	--	--	--	--
IB-7-8.0	15-Jun-93	8.0	<20	>50 ^b	ND	--	5,800	--	--
IB-7-13.0	15-Jun-93	13.0	<20	>50	ND	--	140	--	--
IB-7-17.5	15-Jun-93	17.5	<20	<50	ND	--	--	--	--
IB-8-13.0	16-Jun-93	13.0	<20	>50 ^b	ND	--	6,900	--	--
IB-8-17.5	16-Jun-93	17.5	<20	<50	ND	--	--	--	--
IB-8-20.5	16-Jun-93	20.5	<20	<50	ND	--	--	--	--
IB-9-13.0	16-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-9-13.0	16-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-9-19.5	16-Jun-93	19.5	<20	>50 ^b	D	--	--	--	1,900
IB-9-20.5	16-Jun-93	20.5	<20	<50	ND	--	--	--	--
IB-10-12.0	17-Jun-93	12.0	<20	>50	ND	--	9,600	--	--
IB-10-17.0	17-Jun-93	17.0	<20	<50	ND	--	--	--	--
IB-10-22.0	17-Jun-93	22.0	<20	<50	ND	--	--	--	--
IB-11-5.0	17-Jun-93	5.0	<20	<50	D	--	--	--	450
IB-11-12.0	17-Jun-93	12.0	<20	<50	ND	--	--	--	--
IB-11-32.0	17-Jun-93	32.0	<20	<50	ND	--	--	--	--
IB-12-13.0	17-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-13-13.0	18-Jun-93	13.0	<20	<50	ND	--	--	--	--
IB-13-26.5	18-Jun-93	26.5	<20	<50	ND	--	--	--	--
IB-13-31.0	18-Jun-93	31.0	<20	<50	ND	--	--	--	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
IB-14-11.5	18-Jun-93	11.5	<20	>50 ^b	ND	--	14,000	--	--
IB-14-21.0	18-Jun-93	21.0	<20	<50	ND	--	--	--	--
IB-14-31.0	18-Jun-93	31.0	<20	<50	ND	--	--	--	--
IB-15-16.5	12-Jul-93	16.5	<20	>50	D	--	--	--	15,000
IB-15-20.5	12-Jul-93	20.5	<20	<50	ND	--	--	--	--
IB-15-34.0	12-Jul-93	31.0	<20	<50	ND	--	--	--	--
IB-16-17.5	13-Jul-93	17.5	<20	>50	D	--	--	--	2,400
IB-16-18.5	13-Jul-93	18.5	<20	>50	D	--	--	--	3,900
IB-16-34.0	13-Jul-93	34.0	<20	<50	ND	--	--	--	--
IB-17-19.0	13-Jul-93	19.0	<20	<50	ND	--	--	--	--
IB-17-20.5	13-Jul-93	20.5	<20	<50	ND	--	--	--	--
IB-17-26.5	13-Jul-93	26.5	<20	<50	ND	--	--	--	--
IB-18-13.0	14-Jul-93	13.0	<20	>50	ND	--	170	--	--
IB-18-16.0	14-Jul-93	16.0	<20	>50	ND	--	25,000	--	--
IB-18-29.5	14-Jul-93	29.5	<20	<50	ND	--	--	--	--
IB-19-14.0	14-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-19-16.0	14-Jul-93	16.0	<20	<50	ND	--	--	--	--
IB-19-28.0	14-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-20-14.0	14-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-20-18.0	14-Jul-93	18.0	<20	<50	ND	--	--	--	--
IB-20-28.0	14-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-21-18.0	15-Jul-93	18.0	<20	<50	ND	--	--	--	--
IB-21-19.0	15-Jul-93	19.0	<20	<50	ND	--	--	--	--
IB-21-36.0	15-Jul-93	36.0	<20	<50	ND	--	--	--	--
IB-22-2.0	15-Jul-93	2.0	<20	>50	ND	--	9,300	--	--
IB-22-18.0	15-Jul-93	18.0	<20	<50	ND	--	--	--	--
IB-22-28.0	15-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-23-14.0	15-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-23-18.0	15-Jul-93	18.0	<20	<50	D	--	--	--	<3
IB-23-28.0	15-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-24-14.5	16-Jul-93	14.5	<20	<50	ND	--	--	--	--
IB-24-17.0	16-Jul-93	17.0	<20	>50	ND	--	7,500	--	--
IB-24-36.0	16-Jul-93	36.0	<20	<50	ND	--	--	--	--
IB25-14.0	16-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-24-17.0	16-Jul-93	17.0	<20	<50	ND	--	--	--	--
IB-25-28.0	16-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-26-7.0	16-Jul-93	7.0	<20	>50	ND	--	5,700	--	--
IB-26-16.0	19-Jul-93	16.0	<20	<50	ND	--	--	--	--
IB-26-28.0	19-Jul-93	28.0	<20	<50	ND	--	--	--	--
IB-27-12.0	19-Jul-93	12.0	<20	>50	D	--	--	--	6,900
IB-27-17.0	19-Jul-93	17.0	<20	>50	D	--	--	--	33,000
IB-27-33.0	19-Jul-93	33.0	<20	<50	ND	--	--	--	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
IB-28-14.0	19-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-28-17.0	19-Jul-93	17.0	<20	<50	ND	--	--	--	--
IB-28-24.0	19-Jul-93	24.0	<20	<50	ND	--	--	--	--
IB-29-14.0	20-Jul-93	14.0	<20	<50	ND	--	--	--	--
IB-29-17.0	20-Jul-93	17.0	<20	<50	ND	--	--	--	--
IB-29-23.0	20-Jul-93	23.0	<20	<50	ND	--	--	--	--
IB-30-3.0	20-Jul-93	3.0	<20	>50	ND	--	12,000	--	--
IB-30-11.5	20-Jul-93	11.5	<20	>50	ND	--	12,000	--	--
IB-30-16.5	20-Jul-93	16.5	<20	>50	ND	--	61,000	--	--
IB-30-35.0	20-Jul-93	35.0	<20	<50	ND	--	--	--	--
IB-31-13.0	21-Jul-93	13.0	<20	<50	ND	--	--	--	--
IB-31-17.0	21-Jul-93	17.0	<20	>50	ND	--	5,600	--	--
IB-31-33.0	21-Jul-93	33.0	<20	<50	ND	--	--	--	--
IB-32-11.0	21-Jul-93	11.0	<20	<50	ND	--	--	--	--
IB-32-14.5	21-Jul-93	14.5	<20	<50	ND	--	--	--	--
IB-32-14.5	21-Jul-93	14.5	<20	<50	ND	--	--	--	--
IB-32-23.0	21-Jul-93	23.0	<20	<50	ND	--	--	--	--
IB-33-13.0	21-Jul-93	13.0	<20	>50	ND	--	3,400	--	--
IB-33-14.0	21-Jul-93	14.0	<20	>50	ND	--	3,300	--	--
IB-33-33.0	21-Jul-93	33.0	<20	<50	ND	--	--	--	--
IB-34-13.0	22-Jul-93	13.0	<20	<50	ND	--	--	--	--
IB-34-18.0	22-Jul-93	18.0	<20	<50	ND	--	--	--	--
IB-34-33.0	22-Jul-93	33.0	<20	<50	ND	--	--	--	--
IB-35-13.0	22-Jul-93	13.0	<20	<50	ND	--	--	--	--
IB-35-16.0	22-Jul-93	16.0	<20	<50	ND	--	--	--	--
IB-35-23.0	22-Jul-93	23.0	<20	<50	ND	--	--	--	--
IB-36-13.0	23-Jul-93	13.0	<20	>50	ND	--	12,000	--	--
IB-36-17.0	23-Jul-93	17.0	<20	>50	ND	--	18,000	--	--
IB-36-33.0	23-Jul-93	33.0	<20	<50	ND	--	--	--	--
IB-37-14.0	23-Jul-93	14.0	<20	>50	ND	--	13,000	--	--
IB-37-17.0	23-Jul-93	17.0	<20	>50	D	--	--	--	17,000
IB-37-33.0	23-Jul-93	33.0	<20	<50	ND	--	--	--	--
Pipeline-1	13-Oct-93	NA	<20	>50	ND	--	14,000	--	--
SB-1-3.0	4-Feb-97	3.0	<20	<50	<100	--	--	--	--
SB-1-6.5	4-Feb-97	6.5	<20	<50	<100	--	--	--	--
SB-1-12.5	4-Feb-97	12.5	<20	>50	>100	--	--	--	413
SB-2-2.0	4-Feb-97	2.0	<20	>50	>100 ^c	--	--	--	55.9
SB-2-7.5	4-Feb-97	7.5	<20	<50	<100	--	--	--	--
SB-2-11.0	4-Feb-97	11.0	>20 ^d	>50	>100 ^c	--	6,730	--	--
SB-3-3.5	4-Feb-97	3.5	<20	<50	<100	--	--	--	--
SB-3-6.5	4-Feb-97	6.5	<20	>50	<100	--	--	--	44.2
SB-3-12.0	4-Feb-97	12.0	<20	<50	<100	--	--	--	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
SB-4-5.0	4-Feb-97	5.0	<20	<50	<100	--	--	--	--
SB-4-9.0	4-Feb-97	9.0	<20	>50	>100	--	--	--	242
SB-4-13.5	4-Feb-97	13.5	<20	>50	<100	--	378	--	--
GP-1-10-11'	10-Mar-97	10-11	<20.0	>50.0	>100	--	1,500	--	873J
GP-1-19-20'	10-Mar-97	19-20	--	--	--	71.5	4,460	--	2,250
GP-2-10-11'	10-Mar-97	10-11	<20.0	<50.0	<100	--	--	--	--
GP-2-19-20'	10-Mar-97	19-20	--	--	--	87.3	2,680	--	1,430
GP-3-11-12'	10-Mar-97	11-12	<20.0	<50.0	<100	--	--	--	--
GP-3-19-20'	10-Mar-97	19-20	--	--	--	<2.00	<25.0	--	<20.0
GP-4-15-16'	10-Mar-97	15-16	<20.0	>50.0	>100	--	1,020	--	253J
GP-4-17-18'	10-Mar-97	17-18	--	--	--	150	15,200	--	10,100
GP-5-14-15'	10-Mar-97	14-15	<20.0	>50.0	<100	--	279	--	--
GP-5-15-16'	10-Mar-97	15-16	<20.0	>50.0	>100	--	912	--	73J
GP-6-14.5-15.5'	11-Mar-97	14.5-15.5	<20.0	>50.0	>100	--	808	--	542J
GP-6-18-19'	11-Mar-97	18-19	--	--	--	<2.00	28.1	--	<20.0
GP-7-14-15'	11-Mar-97	14-15	>20.0	>50.0	>100	238J	14,400	--	11,700J
GP-8-11-12'	11-Mar-97	11-12	<20.0	>50.0	<100	--	788	--	--
GP-8-13.5-14.5'	11-Mar-97	13.5-14.5	>20.0	>50.0	>100	42.0J	38,300	--	6,010J
GP-8-19-20'	11-Mar-97	19-20	--	--	--	<2.00	<25.0	--	<20.0
GP-9-14-15'	11-Mar-97	14-15	>20.0	>50.0	<100	264J	14,800	--	--
GP-9-19-20'	11-Mar-97	19-20	--	--	--	3.80	27.6	--	<20.0
GP-10-15-16'	11-Mar-97	15-16	>20.0	>50.0	>100	70.6J	10,000	--	6,020
GP-10-19-20'	11-Mar-97	19-20	--	--	--	<2.00	<25.0	--	<20.0J
GP-11-7-8'	11-Mar-97	7-8	<20.0	<50.0	<100	--	--	--	--
GP-11-11-12'	11-Mar-97	11-12	<20.0	<50.0	<100	--	--	--	--
GP-11-14-14.8'	11-Mar-97	14-14.8	<20.0	>50.0	>100	--	524J	--	579
GP-12-11-12'	11-Mar-97	11-12	<20.0	<50.0	<100	--	--	--	--
GP-12-15-16'	11-Mar-97	15-16	>20.0	>50.0	>100	143J	12,700	--	10,400J
GP-13-14-15'	11-Mar-97	14-15	<20.0	>50.0	<100	--	<25.0	--	--
GP-13-23-24'	11-Mar-97	23-24	--	--	--	<2.00	<25.0	--	20.4
GP-14-14-15'	11-Mar-97	14-15	>20.0	>50.0	>100	153J	3,670	--	12,900J
GP-14-19-20'	11-Mar-97	19-20	--	--	--	<2.00	28.5	--	<20.0
GP-15 15-16'	4-Aug-97	15-16	--	--	--	335	11,000	--	5,740
GP-16 15-16'	4-Aug-97	15-16	--	--	--	313	2,220	--	7,550
GP-17 15-16'	4-Aug-97	15-16	--	--	--	235J	4,650	--	5,360
GP-18 15-16'	4-Aug-97	15-16	--	--	--	5.60	<25.0	--	<20.0
GP-18 19-20'	4-Aug-97	19-20	--	--	--	<2.00	<25.0	--	<20.0
B-1-15'	5-Aug-97	14.5-15.5	--	--	--	4.22	<25.0	--	<20.0
B-2-10'	5-Aug-97	9.5-10.5	--	--	--	<2.00	<25.0	--	<20.0
B-3-10'	5-Aug-97	9.5-10.5	--	--	--	48.5	2,480	--	2,430
B-4-10'	5-Aug-97	9.5-10.5	--	--	--	<2.00	<25.0	--	<20.0
B-4-15'	5-Aug-97	14.5-15.5	--	--	--	<4.00J	5,650 ^e	--	6,310
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
B-5-15'	5-Aug-97	14.5-15.5	--	--	--	102J	1,140	--	846
B-6-15'	5-Aug-97	14.5-15.5	--	--	--	5.23	<25.0	--	<20.0
B-7-15'	6-Aug-97	14.5-15.5	--	--	--	3.95	<25.0	--	<20.0
B-8-15'	6-Aug-97	14.5-15.5	--	--	--	36.3	318	--	83.4
B-9-12.5'	6-Aug-97	12-13	--	--	--	65.8J	6,720	--	6,400
B-11-12.5'	6-Aug-97	12-13	--	--	--	99.8J	11,900	--	10,700
B-12-14'	6-Aug-97	13.5-14.5	--	--	--	118J	12,000	--	8,650
B-13-17.5'	6-Aug-97	17-18	--	--	--	6.38	<25.0	--	<20.0
B-14-15'	6-Aug-97	14.5-15.5	--	--	--	148J	4,870	--	4,940
B-15-15'	6-Aug-97	14.5-15.5	--	--	--	118J	5,100	--	6,160
S-2	29-May-98	9	--	--	--	--	8,330	52,600	--
S-4	29-May-98	10	--	--	--	--	<25.0	<50.0	--
S-6	29-May-98	9	--	--	--	--	1,670	1,130	--
S-9	29-May-98	9	--	--	--	--	3,920	952	--
S-11	29-May-98	9	--	--	--	--	3,110	807	--
S-13	29-May-98	9	--	--	--	--	5,430	867	--
S-13A	29-May-98	18	--	--	--	--	5450J	425J	--
S-15	29-May-98	6	--	--	--	--	1,920	1,530	--
S-15A	29-May-98	15	--	--	--	--	<25.0	<50.0	--
S-16	29-May-98	8	--	--	--	--	42,900	11,400	--
S-16A	29-May-98	16	--	--	--	--	18,000	39,400	--
S-18	29-May-98	10	--	--	--	--	27,000	17,400	--
S-18A	29-May-98	18	--	--	--	--	32,500	68,600	--
S-20	29-May-98	11	--	--	--	--	40,400	18,900	--
S-20A	29-May-98	19	--	--	--	--	27,200	50,500	--
S-21	29-May-98	11	--	--	--	--	44,600	21,200	--
S-21A	29-May-98	19	--	--	--	--	15,900	50,000	--
S-23	29-May-98	7	--	--	--	--	4,870	968	--
S-24	29-May-98	13	--	--	--	--	49,200	31,600	--
S-24A	29-May-98	18	--	--	--	--	2,580	384	--
S-26	29-May-98	9	--	--	--	--	9,800	<1,000	--
S-26A	29-May-98	13	--	--	--	--	<25.0	<50.0	--
S-29	29-May-98	9	--	--	--	--	22,900	<1,000	--
S-29A	29-May-98	13	--	--	--	--	8,370	<1,000	--
S-31	29-May-98	12	--	--	--	--	1,490	<500	--
S-42	9-Jun-98	4	--	--	--	--	<250J	7,970J	--
S-50-A	9-Jun-98	14	--	--	--	--	3,320	<500	--
S-58	9-Jun-98	4	--	--	--	--	26,900	<5,000	--
S-61	9-Jun-98	4	--	--	--	--	2,620	<500	--
S-65	9-Jun-98	4	--	--	--	--	1,450	<500	--
S-70	9-Jun-98	4	--	--	--	--	6,250	1,350	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
GP-19/S-3	25-Jun-98	12-16	--	--	--	--	<25.0	<50.0	--
GP-20/S-4	25-Jun-98	16-18	--	--	--	--	329	<50.0	--
GP-21/S-3	25-Jun-98	12-16	--	--	--	--	<25.0	<50.0	--
GP-22/S-2	25-Jun-98	4-8	--	--	--	--	2,990	<250	--
GP-23/S-3	25-Jun-98	12-15	--	--	--	--	<25.0	<50.0	--
GP-24/S-4	25-Jun-98	16-20	--	--	--	--	<25.0	269	--
GP-25/S-4	26-Jun-98	16-20	--	--	--	--	<25.0	<50.0	--
GP-26/S-4	26-Jun-98	16-20	--	--	--	--	<25.0	<50.0	--
GP-27/S-4	26-Jun-98	16-20	--	--	--	--	<25.0	<50.0	--
GP-28/S-3	26-Jun-98	12-14	--	--	--	--	<25.0	<50.0	--
GP-30/S-6	26-Jun-98	24-28	--	--	--	--	<25.0	<50.0	--
GP-31/S-2	26-Jun-98	8-12	--	--	--	--	927	<50.0	--
GP-32/S-8	30-Sep-98	28-32	--	--	--	--	<25.0	<50.0	--
GP-33/S-9	30-Sep-98	32-36	--	--	--	--	<25.0	<50.0	--
GP-34/S-9	30-Sep-98	32-36	--	--	--	--	<25.0	<50.0	--
GP-35/S-8	30-Sep-98	28-32	--	--	--	--	<25.0	<50.0	--
GP-35/S-9	30-Sep-98	32-36	--	--	--	--	35.3	<50.0	--
GP-36/S-9	1-Oct-98	32-36	--	--	--	--	<25.0	<50.0	--
GP-37/S-7	1-Oct-98	24-28	--	--	--	--	362	<50.0	--
GP-37/S8a	1-Oct-98	28-30	--	--	--	--	721	<50.0	--
GP-37/S-9	1-Oct-98	32-36	--	--	--	--	<25.0	<50.0	--
GP-38/S-5	1-Oct-98	16-20	--	--	--	--	1,170	<50.0	--
GP-38/S-7	1-Oct-98	24-28	--	--	--	--	<25.0	<50.0	--
GP-38/S-9	1-Oct-98	32-36	--	--	--	--	<25.0	<50.0	--
GP-39/S-5b	1-Oct-98	17-20	--	--	--	--	44,700	<2,500	--
GP-39/S-6	1-Oct-98	20-24	--	--	--	--	<25.0	<50.0	--
GP-40/S-8	2-Oct-98	28-32	--	--	--	--	<25.0	<50.0	--
GP-41/S-5	2-Oct-98	16-20	--	--	--	--	<25.0	239	--
GP-42/S-6	2-Oct-98	20-24	--	--	--	--	<25.0	<50.0	--
GP-43/S-6	2-Oct-98	20-24	--	--	--	--	<25.0	<50.0	--
GP-44/S-6	2-Oct-98	20-24	--	--	--	--	<25.0	<50.0	--
GP-45/S-4	2-Oct-98	12-16	--	--	--	--	<25.0	<50.0	--
GP-46/S-3	5-Oct-98	8-12	--	--	--	--	14,500	<2,500	--
GP-46/S-6	5-Oct-98	20-24	--	--	--	--	458	<50.0	--
GP-47/S-4	5-Oct-98	12-16	--	--	--	--	5,390	<50.0	--
GP-47/S-5	5-Oct-98	16-20	--	--	--	--	<25.0	<50.0	--
GP-48/S-2	5-Oct-98	4-8	--	--	--	--	<25.0	<50.0	--
GP-48/S-4	5-Oct-98	12-16	--	--	--	--	9,930	<1,000	--
GP-49/S-1	5-Oct-98	1-4	--	--	--	--	<25.0	<50.0	--
GP-49/S-4	5-Oct-98	12-14	--	--	--	--	16,900	2,000	--
GP-50/S-2	5-Oct-98	4-8	--	--	--	--	<25.0	<50.0	--
GP-50/S-5	5-Oct-98	16-20	--	--	--	--	9,040	1,870	--
GP-51/S-2	6-Oct-98	4-8	--	--	--	--	52.2	74.6	--
GP-52/S-4	6-Oct-98	12-16	--	--	--	--	<25.0	<50.0	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Identification	Sampling Date	Depth in Feet	Concentrations in milligrams per kilogram (mg/kg)						
			HCID			Total Petroleum Hydrocarbons (TPH)			
			Gasoline	Diesel	Oil	Gasoline	Diesel	Oil	TPH-418.1
HC-1/S-7	26-Oct-98	30-31.5	--	--	--	--	<25.0	<50.0	--
HC-2/S-6	28-Oct-98	25-26.5	--	--	--	--	<25.0	<50.0	--
HC-3/S-4	26-Oct-98	15-16	--	--	--	--	<25.0	<50.0	--
HC-3/S-8	26-Oct-98	35-36.5	--	--	--	--	<25.0	<50.0	--
HC-4D/S-4	28-Oct-98	15-16.5	--	--	--	--	<25.0	<50.0	--
HC-4D/S-9	28-Oct-98	40-41.5	--	--	--	--	<25.0	<50.0	--
HC-5/S-5	29-Oct-98	20-21.5	--	--	--	--	<25.0	<50.0	--
HC-5/S-6	29-Oct-98	25-26.5	--	--	--	--	60.0	<50.0	--
HC-5/S-7	29-Oct-98	30-31.5	--	--	--	--	<25.0	<50.0	--
HC-6D/S-4	26-Oct-98	15-16.5	--	--	--	--	<25.0	<50.0	--
HC-7/S-4	27-Oct-98	15-16.5	--	--	--	--	<25.0	<50.0	--
HC-8/S-3	29-Oct-98	10-11.5	--	--	--	--	<25.0	<50.0	--
HC-9/S-5	27-Oct-98	20-21.5	--	--	--	--	<25.0	<50.0	--
HC-10/S-2	27-Oct-98	5-6.5	--	--	--	--	<25.0	<50.0	--
HC-10/S-4	27-Oct-98	15-16.5	--	--	--	--	18,000	<1,000	--
HC-10/S-5	27-Oct-98	20-21.5	--	--	--	--	2,430	<50.0	--
HC-11/S-4	27-Oct-98	15-16.5	--	--	--	--	11,300	<1,000	--
HC-11/S-5	27-Oct-98	20-21.5	--	--	--	--	238	<50.0	--
HC-11/S-6	27-Oct-98	25-26.5	--	--	--	--	114	<50.0	--
HC-12D/S-2	28-Oct-98	5-6.5	--	--	--	--	<25.0	<50.0	--
HC-12D/S-4	28-Oct-98	15-16.5	--	--	--	--	<25.0	<50.0	--
HC-13/S-5	29-Oct-98	20-21.5	--	--	--	--	<25.0	<50.0	--
HC-14/S-2	29-Oct-98	5-6.5	--	--	--	--	392	648	--
HC-14/S-3	29-Oct-98	10-11.5	--	--	--	--	23,900	<5,000	--
HC-14/S-4	29-Oct-98	15-16.5	--	--	--	--	3,430	<500	--
HC-14/S-6	29-Oct-98	25-26.5	--	--	--	--	<25.0	<50.0	--
DEQ Risk-Based Concentration¹⁹									
Direct Soil Contact - Occupational			20,000	14,000	14,000	20,000	14,000	14,000	--
Direct Soil Contact - Construction Worker			9,700	4,600	4,600	9,700	4,600	4,600	--
Hot Spot Levels									
Direct Soil Contact - Occupational/Construction Worker			97,000	46,000	46,000	97,000.0	46,000	46,000	

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

**Table 1 - Soil Chemical Analyses Results: Total Petroleum Hydrocarbons
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Notes:

1. Hydrocarbon identification (HCID) by DEQ Method TPH-HCID. For 1993 analyses, gasoline range is C₆ to C₁₀, and oil range is greater than C₂₈.
2. Gasoline by DEQ Method TPH-G.
3. Diesel analysis (C₁₀-C₂₈) by DEQ Method TPH-D (1993 and 1997 samples). 1998 diesel analysis by Northwest Method NWTPH-Dx (C₁₂-C₂₄).
4. Oil (>C₂₄) analysis by Northwest Method NWTPH-Dx (1998 samples).
5. 418.1: TPH as diesel and oil by DEQ Method TPH-418.1 (1993 and 1997 samples).
6. 1993 and 1997 results reported on a wet weight basis. 1998 results reported on a dry weight basis.
7. -- = Not analyzed.
8. NA: Not available.
9. < = Not detected at or above the indicated laboratory method reporting limit (MRL).
10. D = Detected by HCID (MRL not provided).
11. ND = Not detected by HCID (MRL not provided).
12. J = Analyte identified but associated value may not be consistent with actual amount in sample.
13. ^aNot diesel fuel, but oil eluting in diesel range.
14. ^bIdentified as diesel #2
15. ^cHydrocarbons detected in the heavy oil range do not have a pattern consistent with motor oil.
16. ^dHydrocarbons detected in the gasoline range appear to be due to overlap of diesel range hydrocarbons.
17. ^eAnalysis by the Chevron Research and Technology Company Laboratory identified 24 mg/kg of biodegraded distillate fuel with C₈ to C₂₆ and median of C₁₆-C₁₇. The fuel type may be marine diesel or heavily degraded diesel #2.
18. Sources: 1993 data from Century West (1994); 1997 data from PEG (1997a,b); and 1998 data from Hart Crowser investigations. 1993 data has not been subjected to quality assurance review and was used for qualitative purposes only.
19. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
20. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
21. Bold Box indicates detected concentration exceeds the hot spot value.
22. TPH Oil concentrations screened against DEQ Risk-Based Concentrations for Diesel Range.

Appendix G

Riverbank Area

Appendix G – Riverbank Area

The Portland Harbor Record of Decision includes the Riverbank Area. Therefore, remedial action of this riverbank, including the development of specific material management plans, will be overseen by the EPA. This CMMP is an interim remedial action with respect to the Riverbank Area and will be updated when material management plans are developed for the EPA-led action.

G.1 Riverbank Area Description

Figure G is a site plan of the Riverbank Area including coordinates defining the area boundary. This area covers approximately 0.2 acres. Historically, pencil pitch¹ was imported through Slip 3 at Terminal 4. Residual pencil pitch was observed in surface soil along the river bank. Soil within the depth range of 0 to 4 feet bgs contains polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Two samples contained PAHs exceeding hot spot levels. All samples exceeded the Portland Harbor Riverbank/Sediment screening level for cPAHs and three samples exceeded for total PAHs. A source control action (generally consisting of limited removal and stabilization of the river bank) will be conducted in this area in the future. Figure G shows the sample locations. Tables in this Appendix G summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the investigation report (Ash Creek/Newfields, 2007).

G.2 Restrictions on Use of the Riverbank Area

Routine industrial worker use² of this area is not allowed until the soil with chemicals above Screening Levels is removed or capped.

G.3 Ongoing Remediation Activities in the Riverbank Area

There are no ongoing remediation activities in this area.

G.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

¹ Pencil pitch is a high-carbon, solid product of oil refining used as a raw material in some manufacturing processes. A majority of pencil pitch is comprised of PAHs.

² "Routine industrial worker use" constitutes being within a Management Area on a frequency and duration consistent with DEQ risk criteria for occupational use (8 hours per day, 250 days per year). Short-term activities that would not result in exposure to soil (e.g., passing through a Management Area) would not be considered routine industrial use.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix G.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

G.5 Soil Handling in the Riverbank Area

Until demonstrated otherwise (such as through characterization as described in Section G.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents³ to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section G.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.

³ The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project, restrictions imposed on that Management Area (e.g., bank stabilization requirements), and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1⁴ – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include within 50 feet of either a storm drain or the top of the riverbank.
 - The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.⁵

⁴ The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

⁵ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section G.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

G.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁶ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

G.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁷ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

⁶ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁷ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁸ Samples should be collected from the stored materials and analyzed for PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil should be stored in a stockpile or drop box managed in accordance with Section G.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. . In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.

⁸ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

G.8 Groundwater Handling in the Riverbank Area

The Riverbank Area is located at the boundary of the Groundwater Management Area. See Appendix J for groundwater handling requirements in Groundwater Management Area.

G.9 Notification, Approvals, and Reporting

G.9.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

G.9.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

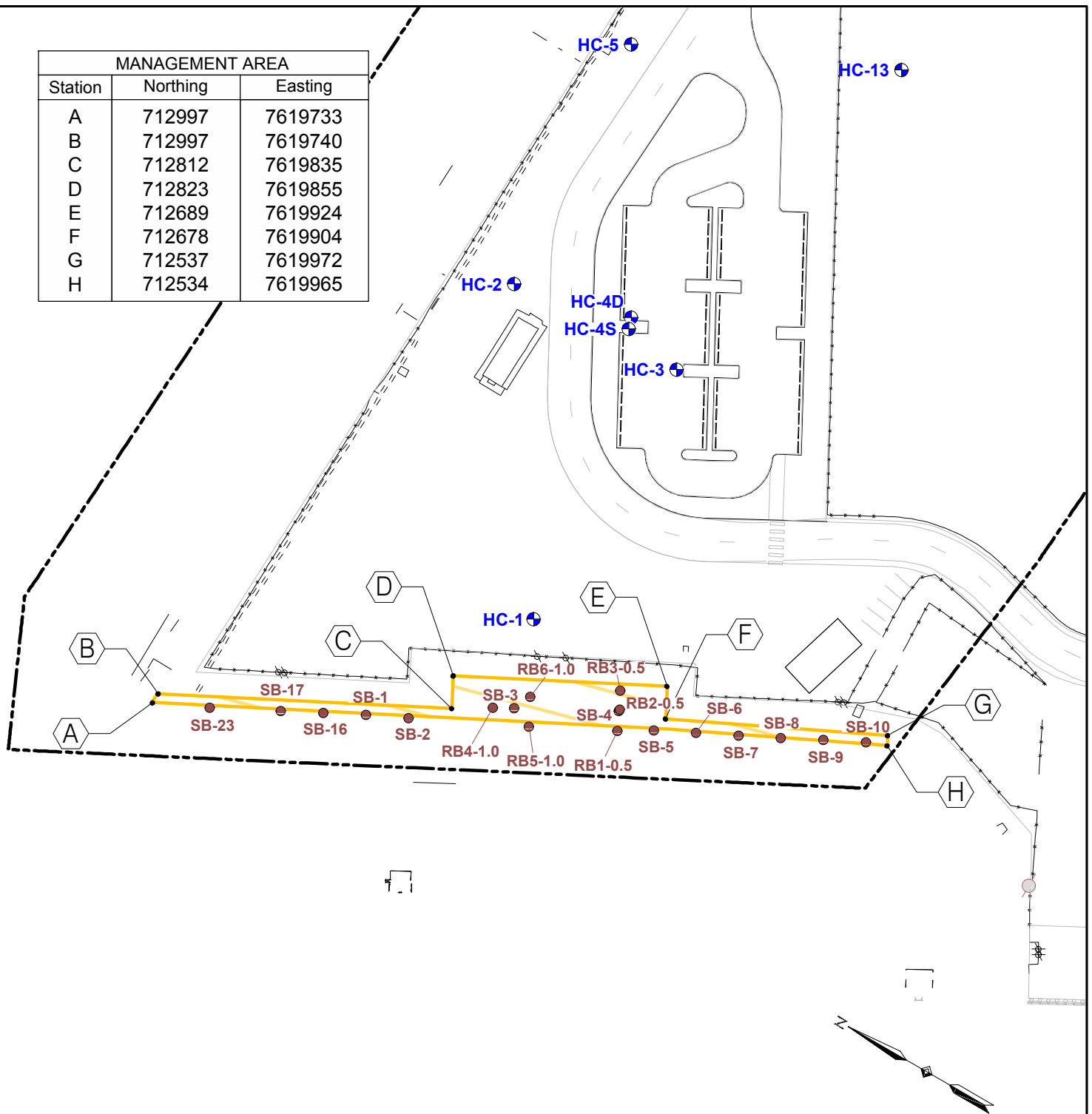
- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 272. The report will be maintained in the Port Terminal 4 Slip 3 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

G.10 References

Ash Creek/Newfields, 2007. *Phase II Pencil Pitch Investigation Report*, Terminal 4 Slip 3 Upland Facility, Port of Portland, Portland, Oregon. July 16, 2007.

MANAGEMENT AREA		
Station	Northing	Easting
A	712997	7619733
B	712997	7619740
C	712812	7619835
D	712823	7619855
E	712689	7619924
F	712678	7619904
G	712537	7619972
H	712534	7619965



Legend:

- HC-1 Monitoring Well Location
- SB-23 Soil Boring Location
- Station Location

0 100 200
Scale in Feet

River Bank Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

NOTES:

- Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
- Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number

1066-10/
1007-21

March 2019

Appendix

G

Table 2
Laboratory Analytical Results: River Bank Samples
Pencil Pitch Characterization
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Sample ID	Date Collected	Sample Depth [feet]	Concentration in mg/kg (ppm)																			
			Total Petroleum Hydrocarbons		Polynuclear Aromatic Hydrocarbons (PAHs)																	
			Diesel	Heavy-Oil	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs	cPAHs (BaP Eq)
River Bank Samples																						
T4S3PP-RB1-0.5	11/17/2005	0.5	--	--	6.37	< 0.373	8.35	51.3	50.5	60.7	29.4	41.3	54.0	14.0	90.6	3.68	28.3	1.82	48.6	63.1	552	79
T4S3PP-RB2-0.5	11/17/2005	0.5	--	--	3.98	< 0.314	5.42	35.7	36.0	45.3	22.6	27.9	38.3	10.4	59.1	2.67	21.2	0.675	32.5	44.1	386	57
T4S3PP-RB3-0.5	11/17/2005	0.5	--	--	0.107	< 0.0153	0.107	1.11	1.30	1.46	0.858	1.02	1.18	0.370	1.73	0.0608	0.779	< 0.0153	0.672	1.32	12	2.0
T4S3PP-RB4-1.0	11/17/2005	1	--	--	0.0186	< 0.0146	0.0204	0.212	0.277	0.257	0.112	0.214	0.279	0.0364	0.343	< 0.0146	0.114	< 0.0146	0.141	0.308	2	0.37
T4S3PP-RB5-1.0	11/17/2005	1	--	--	0.198	< 0.0156	0.307	1.99	2.12	2.91	1.40	1.40	2.17	0.612	3.42	0.133	1.28	0.0288	1.76	2.42	22	3.4
T4S3PP-RB6-1.0	11/17/2005	1	--	--	< 0.0149	< 0.0149	< 0.0149	0.0235	0.0236	0.0293	< 0.0149	0.0258	0.0312	< 0.0149	0.0351	< 0.0149	< 0.0149	< 0.0149	0.015	0.0357	0.23	0.038
SB-1-0.5	2/1/2007	0.5	108	496	< 2.83	< 2.83	< 2.83	6.36	7.60	5.57	7.71	5.59	7.85	< 2.83	11.8	< 2.83	5.68	< 2.83	< 2.83	16.7	75	9.4
SB-1-3	2/1/2007	3	< 69.9	388 J	< 0.075	0.141 J	0.165 J	1.73 J	2.05 J	2.15 J	1.57 J	1.34 J	1.76 J	0.283 J	2.72 J	< 0.075	1.28 J	0.0763 J	0.462 J	3.10 J	19	2.9
SB-2-0.5	2/1/2007	0.5	< 13.5	< 27.0	< 0.0738	< 0.0738	< 0.0738	0.300	0.383	0.379	0.467	0.335	0.380	0.094	0.468	< 0.0738	0.373	< 0.0738	0.165	0.474	3.8	0.59
SB-3-2.5	2/1/2007	2.5	< 14.7	< 29.3	< 0.077	< 0.077	< 0.077	0.102	0.142	0.120	0.147	0.0965	0.120	< 0.077	0.181	< 0.077	0.107	< 0.077	< 0.077	0.202	1.2	0.18
SB-4-3.0	2/1/2007	3	297	520	4.48	< 3.03	4.51	27.1	28.5	29.6	20.3	23.3	30.8	7.43	46.9	< 3.03	19.1	< 3.03	24.8	33.7	301	44
SB-5-0.5	2/1/2007	0.5	< 14.7	147	< 0.779	< 0.779	< 0.779	1.21	1.39	1.39	1.09	1.09	1.42	< 0.779	1.87	< 0.779	0.944	< 0.779	< 0.779	1.60	12	1.8
SB-6-0.5	2/1/2007	0.5	< 13.7	60.2	< 0.0736	< 0.0736	< 0.0736	0.134	0.181	0.173	0.188	0.147	0.209	< 0.0736	0.196	< 0.0736	0.149	< 0.0736	0.130	0.236	1.7	0.23
SB-7-0.5	2/1/2007	0.5	< 13.8	< 27.6	< 0.0735	< 0.0735	< 0.0735	0.184	0.226	0.213	0.180	0.201	0.205	< 0.0735	0.256	< 0.0735	0.163	< 0.0735	0.0974	0.227	2.0	0.28
SB-8-0.5	2/1/2007	0.5	< 13.9	< 27.8	< 0.0732	< 0.0732	< 0.0732	0.0857	0.121	0.109	0.180	0.0981	0.0994	< 0.0732	0.122	< 0.0732	0.132	< 0.0732	< 0.0732	0.129	1.1	0.15
SB-9-0.5	2/1/2007	0.5	< 13.9	37.6	< 0.072	< 0.072	0.0966	0.891	1.16	1.00	0.961	0.886	0.894	0.246	1.42	< 0.072	0.856	< 0.072	0.481	1.19	10	1.7
SB-10-0.5	2/1/2007	0.5	19.8	221	< 0.573	< 0.573	< 0.573	< 0.573	0.688	0.710	< 0.573	< 0.573	0.643	< 0.573	0.806	< 0.573	< 0.573	< 0.573	< 0.573	0.717	3.6	0.76
SB-16-0.5	3/6/2007	0.5	59.9	378	< 0.480	< 0.480	< 0.480	0.658	0.663	1.15	< 0.480	0.596	0.829	< 0.480	0.847	< 0.480	< 0.480	< 0.480	< 0.480	0.829	5.6	0.85
SB-17-0.5	3/6/2007	0.5	< 14.0	< 28.0	< 0.146	< 0.146	< 0.146	0.187	0.205	0.242	0.147	0.170	0.179	< 0.146	0.261	< 0.146	< 0.146	< 0.146	< 0.146	0.271	1.7	0.25
SB-23-0.5	3/6/2007	0.5	91.3	569	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	2.22	< 1.48	< 1.48	1.51	< 1.48	1.48	< 1.48	< 1.48	< 1.48	< 1.48	1.51	6.7	0.22
DEQ Risk-Based Concentration ²																						
Direct Soil Contact - Occupational			14,000	14,000	70,000	--	350,000	2.9	0.29	2.9	--	29	290	0.29	30,000	47,000	2.9	23	--	23,000		
Direct Soil Contact - Construction Worker			4,600	4,600	21,000	--	110,000	24	2.4	24	--	240	2,400	2.4	10,000	14,000	24	580	--	7,500		
River Bank Soil/Sediment			91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	0.012
Hot Spot Levels																						
Direct Soil Contact - Occupational/Construction Worker			46,000	46,000	210,000	--	1,100,000	290	29	290	--	2900	29,000	29	100,000	140,000	290	2300	--	75,000		

- Notes:
1. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
 2. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
 3. Bold indicates detected concentration exceeds hot spot value.
 4. Bold Box indicates detected concentration exceeds the River Bank Soil/Sediment value.
 5. TPH Oil concetrations screened against DEQ Risk-Based Concentrations for Diesel Range.

Appendix H

Former Quaker State Area

Appendix H – Former Quaker State Area

H.1 Former Quaker State Area Description

Figure H is a site plan of the Former Quaker State Area including coordinates defining the area boundary. This area covers approximately 1 acre. This area was subject to multiple operations over many years. Additionally, pencil pitch was observed in soil near the riverbank. In 2009, a hot spot removal action was conducted in this area to address soil exceeding human health hot spot levels and to address potentially erodible soil on the adjacent riverbank (Ash Creek, 2010). Approximately 130 cubic yards of soil were excavated and disposed of off-site. Soil within the depth range of 0 to 5 feet bgs contains polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Total petroleum hydrocarbons (TPH) were also detected. This Management Area is within the Groundwater Management Area and petroleum hydrocarbons are also found both as floating separate-phase liquid and dissolved in groundwater (the groundwater management area is further outlined in Appendix J). Figure H shows the sample locations. Tables in this Appendix H summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the investigation report (Ash Creek/Newfields, 2007).

H.2 Restrictions on Use of the Former Quaker State Area

Routine industrial worker use¹ of this area is not allowed until the soil with chemicals above Screening Levels is removed or capped.

H.3 Ongoing Remediation Activities in the Former Quaker State Area

Ongoing activities within this area are associated with the Groundwater Management Area. These activities include groundwater monitoring and manual removal of liquid hydrocarbons from monitoring wells (see Appendix J).

H.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

¹ "Routine industrial worker use" constitutes being within a Management Area on a frequency and duration consistent with DEQ risk criteria for occupational use (8 hours per day, 250 days per year). Short-term activities that would not result in exposure to soil (e.g., passing through a Management Area) would not be considered routine industrial use.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix H.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

H.5 Soil Handling in the Former Quaker State Area

Until demonstrated otherwise (such as through characterization as described in Section H.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents² to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section H.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations, or other requirements.
- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

² The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project, restrictions imposed on that Management Area (e.g., bank stabilization requirements), and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1³ – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.⁴
- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In

³ The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

⁴ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section H.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

H.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁵ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

H.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁶ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH and PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and

⁵ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁶ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁷ Samples should be collected from the stored materials and analyzed for TPH and PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil should be stored in a stockpile or drop box managed in accordance with Section H.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.
- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

⁷ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

H.8 Groundwater Handling in the Former Quaker State Area

The Former Quaker State Area is located within the Groundwater Management Area. See Appendix J for groundwater handling requirements in this area.

H.9 Notification, Approvals, and Reporting

H.9.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

H.9.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

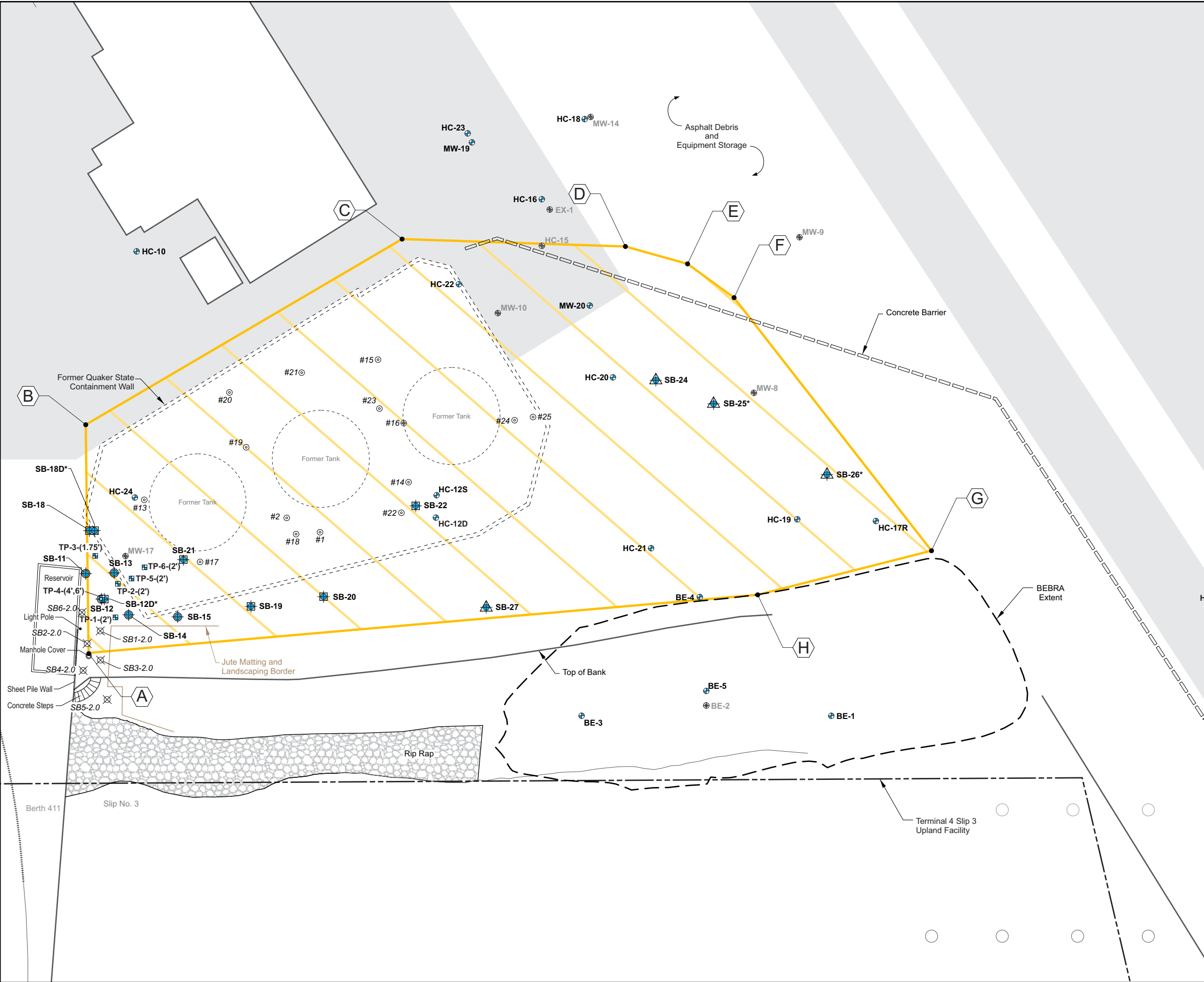
- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 272. The report will be maintained in the Port Terminal 4 Slip 3 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

H.10 References

Ash Creek/Newfields, 2007. *Phase II Pencil Pitch Investigation Report*, Terminal 4 Slip 3 Upland Facility, Port of Portland, Portland, Oregon. July 16, 2007.

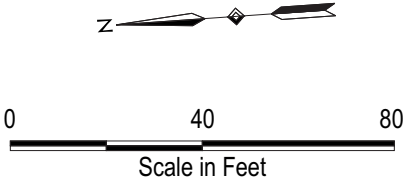
Ash Creek, 2010. *Source Control and Hot Spot Removal Completion Report*, Terminal 4 Slip 3 Upland Facility, Port of Portland, Portland, Oregon. January 5, 2010.



Legend:

- SB-1 Phase II Soil Exploration Location
 - February 2007
 - March 2007
 - April 2007
- RB4-1.0 Phase I Soil Exploration Location (November 2005)
- #2 Historical Surface Soil Exploration Location
- #16 Historical Subsurface Soil Exploration Location
- HC-1 Monitoring Well Location
- HC-8 Abandoned Monitoring Well Location
- TP-1-(2') Test Pit Location and (Depth in Feet)
- Paved Area
- Station Location

MANAGEMENT AREA		
Station	Northing	Easting
A	713392	7620580
B	713386	7620673
C	713253	7620739
D	713162	7620730
E	713138	7620721
F	713120	7620706
G	713046	7620598
H	713118	7620585



Base map prepared from a 1998 City of Portland AutoCAD file.

Former Quaker State Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1066-10/ 1007-21
March 2019	

Appendix
H

Table 1
Confirmation Soil Sample Analytical Results – Hot Spot Removal
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Sample ID	Date Collected	Sample Depth [feet]	Polycyclic Aromatic Hydrocarbons (PAHs)															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
Concentrations in mg/kg (ppm)																		
SB-14-0.5	2/1/2007	0.5	< 3.02	< 3.02	< 3.02	6.84	8.01	7.08	5.96	6.32	7.02	< 3.02	9.20	< 3.02	5.40	< 3.02	3.91	8.38
SB-14-2.4	2/1/2007	2.4	< 3.03	< 3.03	< 3.03	12.9	14.7	12.7	10.6	11.3	12.8	3.36	17.6	< 3.03	9.81	< 3.03	7.72	15.0
TP-3-(1.75')	10/26/2009	1.75	2.66	<0.827	2.42	20.5	22.4	23.2	17.8	18.4	23.5	5.82	33.4	1.21	16.1	0.861	14.0	29.9
TP-4-(4')	10/26/2009	4.0	<0.373	<0.373	0.600	1.66	1.56	1.33	0.790	1.05	1.96	<0.373	3.15	<0.373	0.780	1.96	2.63	3.76
TP-4-(6')	10/26/2009	6.0	<0.0146	<0.0146	<0.0146	0.0265	0.0344	0.0333	0.0301	0.0248	0.0283	<0.0146	0.0382	<0.0146	0.0252	<0.0146	0.0165	0.0411
TP-5-(2')	10/28/2009	2.0	1.90	<0.304	1.34	9.30	11.0	10.9	8.61	8.76	10.3	2.73	14.5	0.711	7.83	0.585	7.98	13.6
TP-6-(2')	10/28/2009	2.0	0.878	<0.289	0.789	6.86	8.43	8.21	6.74	6.48	7.56	2.08	8.41	0.315	6.01	<0.289	4.02	8.80
DEQ RBC - Direct Soil Contact - Occupational			70,000	--	350,000	2.9	0.29	2.9	--	29	290	0.29	30,000	47,000	2.9	23	--	23,000
DEQ RBC - Direct Soil Contact - Construction Worker			21,000	--	110,000	24	2.4	24	--	240	2,400	2.4	10,000	14,000	24	580	--	7,500
Hot Spot Levels																		
DEQ RBC - Direct Soil Contact - Occupational/Construction Worker			210,000	--	1,100,000	290	29	290	--	2,900	29,000	29	100,000	140,000	290	2,300	--	75,000

- Notes:
- Bold values represent detected concentrations of listed analyte.
 - < = Analyte not detected at or above the method reporting limit.
 - PAHs = Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270M-SIM
 - SB-14 samples from Ash Creek/Newfields (2007).
 - Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
 - Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

Table 1
Laboratory Analytical Results - Polycyclic Aromatic Hydrocarbon Concentrations in Soil

Sample ID Depth (ft) Date	Soil #1	Soil #2	Soil #2B	Soil #13	Soil #14	Soil #15	Soil #16	Soil #17	Soil #18	Soil #19	Soil #20	Soil #21	Soil #22	Soil #23	Soil #24	Soil #25	DEQ Risk-Based Concentrations ²		Hot Spot Levels
	0.5 - 3.0 8-Oct-04	0.5 - 3.0 11-Oct-04	1.5 - 2.0 4-Nov-04	1.0 - 1.5 11-Oct-04	1.0 - 1.5 11-Oct-04	1.0 - 1.5 11-Oct-04	3.0 - 3.5 11-Oct-04	0.0 - 1.0 5-Nov-04	0.0 - 1.0 4-Nov-04	0.0 - 1.0 4-Nov-05	0.0 - 1.0 4-Nov-04	0.0 - 1.0 4-Nov-04	0.0 - 1.0 4-Nov-04	0.0 - 1.0 4-Nov-04	0.0 - 1.0 5-Nov-04	0.0 - 1.0 5-Nov-04	Direct Soil Contact - Occupational	Direct Soil Contact - Construction Worker	Direct Soil Contact - Occupational/Construction Worker
Analyte	Concentration in µg/kg (ppb)																		
Acenaphthene	27.9	158	< 67.0	< 67.0	70.3	< 134	16.0	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0	70,000,000	21,000,000	210,000,000
Acenaphthylene	< 13.4	< 67.0	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0	--	--	--
Anthracene	25.5	124	< 67.0	< 67.0	< 67.0	< 134	16.1	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0	350,000,000	110,000,000	1,100,000,000
Benzo(a)anthracene	267	1,050	138	74.2	532	192	115	624	1,250	637	552	648	257	< 134	327	85.7	2,900	24,000	290,000
Benzo(a)pyrene	348	1,220	238	107	655	194	144	818	1,580	876	665	810	305	170	374	108	290	2,400	29,000
Benzo(b)fluoranthene	344	1,150	179	85.5	638	170	131	760	1,710	854	519	830	359	166	417	112	2,900	24,000	290,000
Benzo(ghi)perylene	318	1,060	242	132	603	251	133	844	1,260	744	593	793	301	473	348	107	--	--	--
Benzo(k)fluoranthene	245	913	145	67.4	461	142	102	628	1,130	595	500	581	250	< 134	322	79.5	29,000	240,000	2,900,000
Chrysene	322	1,190	188	96.8	616	231	120	695	1,430	749	631	763	328	163	382	98.4	290,000	2,400,000	29,000,000
Dibenzo(a,h)anthracene	93.3	333	< 67.0	< 67.0	184	< 134	39.8	< 335	369	169	< 134	201	< 134	< 134	< 268	< 67.0	290	2,400	29,000
Fluoranthene	401	1,800	229	124	866	321	158	934	1,910	1,020	957	1,110	415	190	513	126	30,000,000	10,000,000	100,000,000
Fluorene	14.5	77.8	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0	47,000,000	14,000,000	140,000,000
Indeno(1,2,3-cd)pyrene	280	968	174	95.2	537	166	116	590	1,080	597	456	632	254	169	301	84.5	2,900	24,000	290,000
Naphthalene	< 13.4	< 67.0	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0	23,000	580,000	2,300,000
Phenanthrene	167	776	< 67.0	< 67.0	352	174	68.6	365	761	349	230	484	186	< 134	< 268	< 67.0	--	--	--
Pyrene	432	1,400	308	144	766	563	153	878	1,630	1,080	1,070	981	370	446	449	121	23,000,000	7,500,000	75,000,000

Notes:

1. < = Not Detected at Associated Method Reporting Limit.
2. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
3. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.

Table 1
Laboratory Analytical Results: Slip Bank Samples
Pencil Pitch Characterization
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Sample ID	Date Collected	Sample Depth [feet]	Concentration in mg/kg (ppm)																		Total PAHs		
			Total Petroleum Hydrocarbons		Polycyclic Aromatic Hydrocarbons (PAHs)																		
			Diesel	Heavy-Oil	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total	cPAHs	% cPAHs
Slip Bank Samples (Bank)																							
T4S3PP-SB5-2.0	11/16/2005	2	--	--	0.582	< 0.0155	0.673	4.51	3.90	4.75	2.37	3.06	4.40	1.16	6.46	0.549	2.27	0.111	4.18	4.86	--	--	--
Slip Bank Samples (Upland)																							
T4S3PP-SB1-2.0	11/16/2005	2	--	--	2.56	< 0.285	2.33	21.5	24.1	23.5	15.2	18.7	20.1	6.48	28.1	0.831	13.8	0.383	10.2	24.3	212	128	60.4%
T4S3PP-SB2-2.0	11/16/2005	2	--	--	0.758	< 0.155	0.757	7.87	9.08	9.76	5.79	6.52	7.85	2.39	11.3	0.309	5.21	0.162	3.63	9.38	80.8	48.7	60.2%
T4S3PP-SB3-2.0	11/16/2005	2	--	--	0.0343	< 0.0165	0.0343	0.299	0.386	0.304	0.180	0.256	0.366	0.0506	0.483	0.0182	0.176	0.0213	0.182	0.484	3.28	1.84	56.0%
T4S3PP-SB4-2.0	11/16/2005	2	--	--	0.273	< 0.0154	0.409	2.54	2.76	2.96	1.87	2.00	2.38	0.78	3.68	0.102	1.69	0.0567	1.64	2.96	26.1	15.1	57.9%
T4S3PP-SB6-2.0	11/16/2005	2	--	--	1.86	< 0.314	1.67	18.8	20.7	22.8	13.0	15.1	18.5	5.63	28.7	1.04	11.8	0.325	9.33	23.0	192	113	58.9%
SB-12-0.5	2/1/2007	0.5	73.4	151	0.896	< 0.375	0.820	5.73	6.69	5.95	4.47	5.14	5.74	1.49	8.17	< 0.375	4.25	< 0.375	3.40	6.84	60.1	35.0	58.2%
SB-12D-5	3/6/2007	5	39.4	59.1	< 0.0148	< 0.0148	< 0.0148	0.0957	0.106	0.124	0.0647	0.0712	0.0845	0.0204	0.128	< 0.0148	0.061	< 0.0148	0.0554	0.132	0.980	0.563	57.4%
SB-13-0.5	2/1/2007	0.5	204	680	< 2.98	< 2.98	< 2.98	12.6	15.0	13.8	10.8	12.0	13.1	3.37	17.6	< 2.98	9.83	< 2.98	7.72	15.4	139	79.7	57.5%
SB-13-2.5	2/1/2007	2.5	2,090	4,410	< 2.94	< 2.94	< 2.94	< 2.94	3.22	2.94	< 2.94	< 2.94	3.11	< 2.94	4.29	< 2.94	< 2.94	< 2.94	< 2.94	3.56	33.3	15.2	45.5%
SB-14-0.5	2/1/2007	0.5	39.7	88.8	< 3.02	< 3.02	< 3.02	6.84	8.01	7.08	5.96	6.32	7.02	< 3.02	9.20	< 3.02	5.40	< 3.02	3.91	8.38	77.2	42.2	54.7%
SB-14-2.4	2/1/2007	2.4	78.9	176	< 3.03	< 3.03	< 3.03	12.9	14.7	12.7	10.6	11.3	12.8	3.36	17.6	< 3.03	9.81	< 3.03	7.72	15.0	136	77.6	57.0%
SB-15-0.5	2/1/2007	0.5	29.0	85.8	< 3.04	< 3.04	< 3.04	5.71	7.04	6.74	5.65	5.55	6.04	< 3.04	7.50	< 3.04	4.96	< 3.04	< 3.04	6.97	66.8	37.6	56.2%
SB-15-2.8	2/1/2007	2.8	< 13.9	< 27.9	< 0.0147	< 0.0147	< 0.0147	0.0686	0.0865	0.0803	0.0737	0.0671	0.0774	0.0199	0.100	< 0.0147	0.0624	< 0.0147	0.0394	0.0906	0.803	0.462	57.6%
SB-18D-0.5	3/6/2007	0.5	166	366	< 2.95	< 2.95	< 2.95	7.40	8.52	10.7	5.15	5.47	6.62	< 2.95	9.00	< 2.95	5.09	< 2.95	3.34	9.03	79.2	45.3	57.2%
SB-18D-5	3/6/2007	5	44.4	97.8	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	< 0.0153	0.122	0.0536	43.8%
SB-19-0.5	3/6/2007	0.5	107	233	< 0.779	< 0.779	< 0.779	7.06	7.95	9.78	4.77	5.06	6.40	1.91	8.90	< 0.779	4.80	< 0.779	3.17	8.73	70.5	43.0	61.0%
SB-19-2.5	3/6/2007	2.5	82.6	167	0.0343	< 0.0149	0.0317	0.256	0.277	0.296	0.150	0.204	0.215	0.0563	0.315	< 0.0149	0.152	< 0.0149	0.134	0.317	2.46	1.46	59.2%
SB-20-0.5	3/6/2007	0.5	17.9	43.3	< 0.743	< 0.743	< 0.743	3.23	3.70	4.12	22.4	2.82	2.95	0.822	4.04	< 0.743	2.25	< 0.743	1.47	4.01	53.7	19.9	37.1%
SB-20-2.5	3/6/2007	2.5	< 13.9	< 27.8	< 0.752	< 0.752	< 0.752	2.11	2.42	2.72	1.38	1.73	1.91	< 0.752	2.59	< 0.752	1.41	< 0.752	0.999	2.59	22.1	12.7	57.3%
SB-21-0.5	3/6/2007	0.5	34.2	71.9	< 1.53	< 1.53	< 1.53	4.06	4.33	5.34	2.59	3.17	3.60	< 1.53	5.18	< 1.53	2.65	< 1.53	2.15	5.05	42.7	23.9	56.0%
SB-22-0.5	3/6/2007	0.5	126	200	< 2.90	< 2.90	< 2.90	11.5	13.7	16.7	9.13	9.31	10.2	3.28	13.3	< 2.90	8.80	< 2.90	5.01	14.2	122	73.5	60.1%
SB-24-1	4/16/2007	1	38.8	241	< 0.691	< 0.691	< 0.691	1.91	2.75	2.88	2.82	2.11	2.24	1.01	2.26	< 0.691	2.49	< 0.691	0.916	2.53	25.6	15.4	60.0%
SB-24-2	4/16/2007	2	< 13.6	< 27.1	< 0.288	< 0.288	< 0.288	1.80	2.51	2.78	2.22	1.77	2.09	0.66	2.30	< 0.288	2.00	< 0.288	0.956	2.77	22.6	13.6	60.3%
SB-25-1	4/16/2007	1	21.6	138	< 0.293	< 0.293	< 0.293	1.72	2.35	2.63	2.04	1.69	2.01	0.82	2.28	< 0.293	1.84	< 0.293	0.926	2.72	21.8	13.1	60.0%
SB-25-2	4/16/2007	2	< 13.3	< 26.7	< 0.0142	< 0.0142	< 0.0142	0.0891	0.134	0.158	0.136	0.109	0.111	0.0452	0.117	< 0.0142	0.112	< 0.0142	0.0518	0.154	1.25	0.758	60.5%
SB-26-1	4/16/2007	1	28.3	210	< 0.370	< 0.370	< 0.370	0.447	0.670	0.630	0.679	0.531	0.548	< 0.370	0.635	< 0.370	0.520	< 0.370	0.699	6.65	3.53	53.1%	
SB-26-2	4/16/2007	2	849	5,150	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	< 0.714	5.71	2.50	43.8%
SB-27-1	4/16/2007	1	18.4	167	< 0.297	< 0.297	< 0.297	1.18	1.69	1.71	1.59	1.25	1.33	0.594	1.55	< 0.297	1.39	< 0.297	0.651	1.77	15.4	9.14	59.2%
SB-27-2	4/16/2007	2	32.2	111	< 0.295	< 0.295	< 0.295	1.49	2.10	2.45	1.82	1.38	1.72	0.667	1.96	< 0.295	1.59	< 0.295	0.769	2.33	19.0	11.4	59.9%
DEQ Risk-Based Concentration ²																							
Direct Soil Contact - Occupational			14,000	14,000	70,000	--	350,000	2.9	0.29	2.9	--	29	290	0.29	30,000	47,000	2.9	23	--	23,000	--	--	--
Direct Soil Contact - Construction Worker			4,600	4,600	21,000	--	110,000	24	2.4	24	--	240	2,400	2.4	10,000	14,000	24	580	--	7,500	--	--	--
Hot Spot Levels																							
Direct Soil Contact - Occupational/Construction Worker			46,000	46,000	210,000	--	1,100,000	290	29	290	--	2900	29,000	29	100,000	140,000	290	2300	--	75,000	--	--	--

Notes:

1. **Bold** values represent detected concentrations of listed analyte.
2. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
3. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
4. TPH Oil concetrations screened against DEQ Risk-Based Concentrations for Diesel Range.
5. Bold Box indicates detected concentration exceeds the hot spot level.

Appendix I

South Slip 3 Area

Appendix I – South Slip 3 Area

The Portland Harbor Record of Decision includes the South Slip 3 Area. Therefore, remedial action of this riverbank, including the development of specific material management plans, will be overseen by the EPA. This CMMP is an interim remedial action with respect to the South Slip Area and will be updated when material management plans are developed for the EPA-led action.

1.1 South Slip 3 Area Description

Figure I is a site plan of the South Slip 3 Area including coordinates defining the area boundary. This area covers approximately 0.6 acres. This area is a former pier used for import/export for many years. Soil within the depth range of 0 to 4 feet below the ground surface contains polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use (Screening Levels). Two samples contained PAHs exceeding hot spot levels. All samples exceeded the Portland Harbor Riverbank/Sediment screening level for cPAHs and eight samples exceeded for total PAHs. This Management Area is within the Groundwater Management Area and petroleum hydrocarbons are also found dissolved in groundwater (the groundwater management area is further outlined in Appendix J). Figure I shows the sample locations. Tables in this Appendix I summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the investigation report (Ash Creek, 2008). A source control action (generally consisting of limited removal and stabilization of the river bank) will be conducted in this area in the future.

1.2 Restrictions on Use of the South Slip 3 Area

Routine industrial worker use¹ of this area is not allowed until the soil with chemicals above Screening Levels is removed or capped.

1.3 Ongoing Remediation Activities in the South Slip 3 Area

There are no ongoing remediation activities in this area.

1.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

¹ "Routine industrial worker use" constitutes being within a Management Area on a frequency and duration consistent with DEQ risk criteria for occupational use (8 hours per day, 250 days per year). Short-term activities that would not result in exposure to soil (e.g., passing through a Management Area) would not be considered routine industrial use.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for soil investigations at this Management Area are reproduced in this Appendix I.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

1.5 Soil Handling in the South Slip 3 Area

Until demonstrated otherwise (such as through characterization as described in Section 1.7), soil from this Management Area shall be presumed to contain chemicals above unrestricted soil use concentrations. Soil shall be handled (including grading, excavation, stockpiling, loading, hauling, filling, and disposal) in accordance with the project contract documents² to prevent worker exposure, control dust, prevent erosion of soil from stormwater runoff, and prevent the spread of chemicals in soil. Minimum requirements include:

- Follow the requirements of the project health and safety plan (see Section 1.4).
- Control dust with water spray, dust suppression application, or covers (e.g., on stockpiles) as needed. Consider wind conditions in planning work activities.
- Implement best management practices in the contract documents that may include silt fencing, catch basin filters, rock construction entrance, tire wash stations or other requirements.

² The Port's standard project contract documents include as applicable reference to relevant federal, state, and local regulations governing site development including but not limited to stormwater quality, environmental cleanup, waste handling, air quality, noise, traffic, etc.

- Place and construct stockpiles in a manner that prevents dust, sedimentation, or leaching of chemicals. This includes covering when not in use and perimeter berms to prevent run-on and runoff of stormwater.

Soil shall be re-used as fill or properly disposed of. Any re-use or disposal must be with the permission of the property owner where the soil is re-used or disposed of. The following lists the conditions defining the allowable options for final disposition of excavated soil.

- Soil may be re-used as fill if concentrations do not exceed hot spot concentrations (see Table 1) and under the following conditions:
 - Within the Management Area where the soil is generated, the soil may be replaced without restriction provided that it meets the other requirements of the project, restrictions imposed on that Management Area (e.g., bank stabilization requirements), and there are no indicators of unanticipated contamination. The most common re-use scenario would be construction projects where excavated soil is typically replaced in the excavation. Examples include underground utilities, foundations, roadways, and embankments. Soil exceeding the Portland Harbor Riverbank/Sediment screening level (Table 1) may not be re-used on or within 50 feet of a riverbank or storm drain.
 - Soil may be used on Terminal 4 provided that the chemical concentrations are less than DEQ risk-based concentrations for construction workers and occupational use – see Table 1³ – and the soil is not subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - If the chemical concentrations are above the DEQ RBCs for construction workers or occupational use (see Table 1) soil may be used on Terminal 4 provided that the placement area is designated as a Management Area covered by this CMMP. If chemical concentrations are above the Portland Harbor Riverbank/Sediment screening level, the soil may not be placed in an area subject to erosion. Areas where the soil would be subject to erosion include the riverbanks or within 50 feet of either a storm drain or the top of the riverbank.
 - The soil may be used as clean fill (with permission of property owner where used) if chemical concentrations are less than the clean fill criteria in Table 2.⁴

³ The chemicals listed in Table 1 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the risk-based concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>.

⁴ Placement of soil may be subject to the DEQ Materials Management rules that may include permitting, local authority approval, fees, etc. Placement of clean fill is exempt from those rules. It is the intention of the requirements of this CMMP that soil shall be taken off-site for re-use only if it meets the DEQ requirements for clean fill. Otherwise, soil taken off-site shall be disposed of in a licensed landfill. The chemicals listed in Table 2 are those most likely to be present, and the concentrations are current as of the publication of the CMMP. The DEQ periodically updates the clean fill

- Soil may be disposed of in a landfill in accordance with the requirements of the disposal facility. Excavated soil exceeding hot spot levels (see Table 1) must be disposed of in a licensed landfill. In accordance with solid and hazardous waste laws, conduct a waste designation evaluation to determine if the soil would qualify as a solid or hazardous waste. Based on historical data, soil from the Management Areas would not designate as hazardous waste but may be solid waste. This evaluation must be updated for each project where soil will be excavated. The evaluation may use existing data in this Appendix or new data collected in accordance with Section I.7. In general, soil would be disposed of in a Subtitle D landfill under a special waste permit from the landfill.

I.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated⁵ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated soil, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VCP agreements or state/federal law.

I.7 Characterization of Soil

In general, it is expected that soil within this Management Area will be characterized using the existing data in this appendix. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the soil using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.⁶ Soil characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Soil in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

concentrations. Check for updates or additional chemicals at <https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

⁵ Contaminated soil is soil that produces fuel or chemical odors, produces an oil sheen on the surface of water, has staining, contains debris or other visible indicators, or soil designated by the Port as contaminated.

⁶ Generally, the needs of the project dictate the method selected. For example, for a small excavation where the soil will be disposed of in an off-site landfill, the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and there is ample room for a stockpile, sampling after excavation may be suitable. If the user is attempting to reach a specific concentration goal and wants some certainty in the amount of excavation that will be required, sampling prior to excavation is the best approach.

Soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The number and location of samples must be sufficient to characterize the soil to the satisfaction of the end user (e.g., fill site, disposal facility, the Port, etc.). The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location, and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- Target areas of higher potential concentrations such as visible impacts, pipe joints, etc.
- In the absence of indicators of potential impacts, collect samples at 50-foot intervals on linear features (trenches, excavation sidewalls) or for each 2,500 square feet for areal features (excavation bottom).
- Samples may be collected using borings, direct push equipment, excavated pits, or hand tools, as appropriate.

Method B – Characterization After Removal

The concentrations of chemicals in soil are variable within the Management Area. The implementing party may choose to wait until the soil is removed to characterize the material for final disposition. In that event, the soil must be properly stored until characterized.⁷ Samples should be collected from the stored materials and analyzed for PAHs. If characterizing for disposal, the landfill may also require analysis for leachable metals.

Soil should be stored in a stockpile or drop box managed in accordance with Section I.5. As with in-place characterization, soil samples may be collected as discrete, composite, or incremental sampling methodology samples. The actual number and location of samples, and the sample collection methods should be determined by an environmental professional. Minimum requirements for number, location and methodology include the following:

- The number of samples collected may range from one to a maximum of one sample per 100 cubic yards of soil being characterized.
- The sample locations should be randomly selected using a method that results in samples that are representative of the entire volume being characterized. In general, one composite sample per stockpile or drop box is suitable for homogeneous material. The number of samples should be increased based on the relative heterogeneity of the material.

⁷ The length of time that materials will be stored on the site may be dictated by the needs of the project. Storage of contaminated materials may be subject to the requirements of DEQ Materials Management rules. For example, a Solid Waste Letter Authorization is required to stockpile contaminated materials longer than 30 days.

- Samples should be representative of the material being characterized. Any sample should be collected at least 6 inches from the pile surface or the contact with drop box walls, drums, or excavation equipment.

1.8 Groundwater Handling in the South Slip 3 Area

The South Slip 3 Area overlaps the Groundwater Management Area. See Appendix J for groundwater handling requirements in this area.

1.9 Notification, Approvals, and Reporting

1.9.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

1.9.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

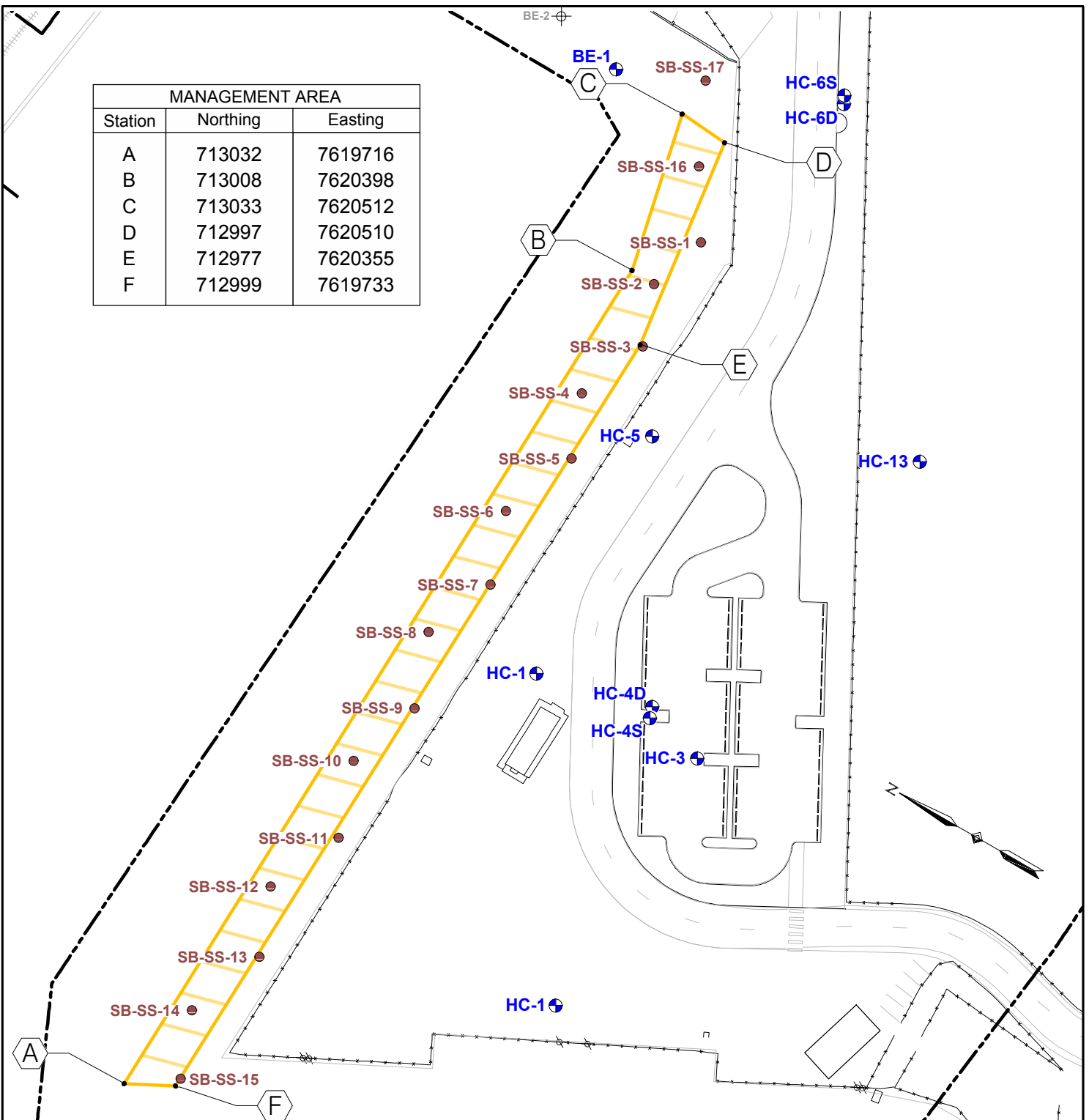
- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution; and
- Sample locations and analytical laboratory reports.

The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 272. The report will be maintained in the Port Terminal 4 Slip 3 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

I.10 References

Ash Creek, 2008. Pencil Pitch – South Bank Characterization, Terminal 4 Slip 3. July 2, 2008.

MANAGEMENT AREA		
Station	Northing	Easting
A	713032	7619716
B	713008	7620398
C	713033	7620512
D	712997	7620510
E	712977	7620355
F	712999	7619733



Legend:

- HC-1 Monitoring Well Location
- BE-2 Destroyed/Abandoned Monitoring Well Location
- SB-SS-14 Soil Boring Location
- A Station Location

0 100 200
Scale in Feet

South Slip 3 Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number **1066-10/1007-21**
March 2019

Appendix
I

Table 1
PAHs in Surface Soil
South Bank Characterization
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Sample ID	Date Collected	Polycyclic Aromatic Hydrocarbons (PAHs)																Total PAHs		
		mg/Kg or ppm																mg/Kg or ppm		
		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total	cPAHs	% cPAHs
SB-SS-1	1/24/2008	<3.23	<3.23	4.33	30.0	36.7	23.1	30.6	24.4	36.3	5.0	55.1	<3,230	24.5	<3,230	13.4	54.5	338	230	68%
SB-SS-2	1/24/2008	<0.145	<0.145	<0.145	0.171	0.168	0.543	0.271	0.292	0.447	<0.145	0.368	<0.145	0.265	<0.145	0.153	0.255	2.9	1.9	65%
SB-SS-3	1/24/2008	<1.43	<1.43	<1.43	2.31	3.08	3.21	2.56	2.51	2.89	<1.43	3.55	<1.43	2.43	<1.43	<1.43	2.57	25	16.5	66%
SB-SS-4	1/24/2008	<0.153	<0.153	<0.153	0.28	0.403	0.348	0.476	0.285	0.406	<0.153	0.485	<0.153	0.367	<0.153	<0.153	0.525	3.6	2.54	71%
SB-SS-5	1/24/2008	<0.708	<0.708	0.845	1.83	1.82	2.61	2.36	2.11	3.05	<0.708	1.89	<0.708	2.08	<0.708	0.789	1.38	21	12.9	62%
SB-SS-6	1/24/2008	<0.774	<0.774	<0.774	1.83	2.35	2.0	2.52	1.97	2.35	<0.774	3.27	<0.774	2.08	<0.774	1.21	2.67	22	14.9	67%
SB-SS-7	1/24/2008	<0.0143	0.0202	0.024	0.141	0.195	0.155	0.194	0.138	0.169	0.0344	0.256	<0.0143	0.158	<0.0143	0.0501	0.263	1.8	1.21	67%
SB-SS-8	1/24/2008	<0.292	<0.292	0.408	2.0	2.31	1.6	2.18	1.7	2.39	0.366	4.65	<0.292	1.69	<0.292	1.09	4.67	25	17.6	70%
SB-SS-9	1/24/2008	<1.43	<1.43	<1.43	12.7	17.1	11.4	15.3	10.6	14.8	2.46	24.5	<1.43	11.7	<1.43	3.72	27.4	152	107	70%
SB-SS-10	1/24/2008	<2.97	<2.97	3.63	26.5	36.0	25.0	31.0	21.7	32.6	4.95	57.2	<2.97	23.9	<2.97	10.1	61.5	334	233	70%
SB-SS-11	1/24/2008	<1.47	1.53	1.69	15.5	20.8	12.8	16.5	13.8	18.4	2.81	31.3	<1.47	13.0	<1.47	4.05	36.3	188	132	70%
SB-SS-12	1/24/2008	<1.46	<1.46	<1.46	12.5	16.5	11.0	14.5	11.8	16.0	2.44	23.2	<1.46	11.2	<1.46	4.51	23.8	147	103	70%
SB-SS-13	1/24/2008	<0.0142	<0.0142	0.0276	0.113	0.133	0.156	0.108	0.125	0.147	0.0307	0.21	<0.0142	0.103	<0.0142	0.0931	0.147	1.4	0.87	62%
SB-SS-14	1/24/2008	<0.0146	<0.0146	<0.0146	<0.0146	0.019	0.0189	0.0167	<0.0146	0.0191	<0.0146	0.029	<0.0146	<0.0146	<0.0146	<0.0146	0.0261	0.13	0.091	71%
SB-SS-15	1/24/2008	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	0.0167	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	0.017	0.017	100%
SB-SS-16	1/24/2008	<147	<147	<147	2.64	3.23	3.42	2.62	2.56	3.49	<1.47	4.14	<1.47	2.3	<1.47	1.61	4.42	30	19.5	64%
SB-SS-17	1/24/2008	<0.716	<0.716	1.33	13.3	14.8	10.2	9.11	9.67	15.7	1.76	25.0	<0.716	7.93	<0.716	4.26	29.7	143	99	69%
DEQ Risk-Based Concentration ²																				
Direct Soil Contact - Occupational		70,000	--	350,000	2.9	0.29	2.9	--	29	290	0.29	30,000	47,000	2.9	23	--	23,000	--	--	--
Direct Soil Contact - Construction Worker		21,000	--	110,000	24	2.40	24	--	240	2,400	2.4	10,000	14,000	24	580	--	7,500	--	--	--
River Bank Soil/Sediment		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	0.012	--
Hot Spot Levles																				
Direct Soil Contact - Occupational/Construction Worker		210,000	--	1,100,000	290	29	290	--	2900	29,000	29	100,000	140,000	290	2300	--	75,000	--	--	--

Notes:

1. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon Department of Environmental Quality, November 1, 2015 (see <https://www.oregon.gov/deq/tanks/Pages/Risk-Based-Decision-Making.aspx>).
2. Shading indicates detected concentrations exceed one or more DEQ Risk-Based Concentrations values.
3. Bold indicates detected concentration exceeds hot spot value.

Appendix J

Groundwater Area

Appendix J – Groundwater Area

J.1 Groundwater Area Description

Figure J is a site plan of the Groundwater Area including coordinates defining the area boundary. This area covers approximately 17 acres. The Groundwater Management Area is based on the historical extent of petroleum dissolved in groundwater with a minimum 100-foot surrounding buffer zone. The buffer zone was used to account for the potential influence of dewatering from a construction excavation. Depth to groundwater ranges from 12 to 22 feet below the ground surface.

Groundwater impacts in this area are the result of releases from the petroleum pipeline discussed in Appendix F. Groundwater in this area may contain petroleum hydrocarbons (originally diesel/fuel oil type hydrocarbons) as total petroleum hydrocarbons (TPH) or polycyclic aromatic hydrocarbons (PAHs) above human health risk-based screening levels for commercial/industrial site use or levels protective of ecological receptors in the river (Screening Levels). A smaller area within the Groundwater Management Area has historically had separate-phase liquid hydrocarbons on the groundwater.

Figure J shows groundwater sample locations. Tables in this Appendix J summarize relevant chemical data for this Management Area. Copies of the laboratory reports are contained in the remedial investigation report (Hart Crowser, 2000) and groundwater monitoring reports (Ash Creek, 2015 and 2016).

J.2 Restrictions on Use of the Groundwater Area

Restrictions within this area related to soil impacts are discussed in Appendix F, G, H, and I. In summary, portions of the Groundwater Area include soil with PAHs above Screening Levels. In these portions of the area, there are limitations on how the areas may be used and on handling/re-use of soil during construction projects.

Restrictions related to activities (such as construction) that may encounter groundwater are discussed in Section J.5.

To the extent that the Port (or one of its tenants) uses groundwater at Terminal 4 for any purpose, the Port and/or tenant shall do so in a manner that does not contribute to or exacerbate any pre-existing condition at Terminal 4 with regards to the magnitude or extent of the chemicals in groundwater. In addition, groundwater in the Groundwater Management Area shall not be used for any purpose unless such use can be shown to result in acceptable risk. Existing data may be used for that evaluation, but because of potential lateral variability and degradation of petroleum hydrocarbons, sampling of groundwater in the area of planned activities would likely be warranted.

J.3 Ongoing Remediation Activities in the Groundwater Area

Ongoing environmental activities include annual groundwater monitoring and manual removal of liquid hydrocarbons. Groundwater sampling includes measuring water levels in multiple wells within the Groundwater Management Area and collecting samples from four wells. Monitoring is conducted in December. Removal of liquid hydrocarbons is conducted from January through June, with the frequency of visits varying from weekly to monthly.

J.4 Health and Safety Considerations

This section addresses health and safety planning in addition to what is normally implemented for construction activities. Any party completing any activity within this Management Area must comply with the following minimum requirements. Each user of this CMMP must determine the health and safety requirements and level of training required for the specific activities that they will be undertaking.

A Health and Safety Plan shall be prepared by a Certified Industrial Hygienist or a safety professional with a minimum of 40 hours of OSHA HAZWOPER training. The Health and Safety Plan shall meet the applicable requirements of state and federal law and identify and address, but not be limited to, the physical and chemical hazards of the site and the proposed activities. Data tables for groundwater investigations at this Management Area are reproduced in this Appendix J.

The Health and Safety Plan content shall, at a minimum, describe the following:

- Worker training requirements;
- Required personal protective equipment;
- Site safety supervisor and chain of command;
- Action levels at which protection would be upgraded or work stopped;
- Controls to be used to minimize worker exposure to hazardous substances;
- Exclusion, contamination reduction, and clean zones;
- Personnel decontamination procedures;
- Route to hospital; and
- Monitoring equipment to be employed.

J.5 Groundwater Handling in the Groundwater Area

This section discusses special management requirements related to groundwater. These requirements are in addition to all requirements that may be imposed on construction projects under federal, state, or local regulations. Unless demonstrated otherwise (such as through characterization as described in Section J.7),

groundwater from this Management Area shall be presumed to contain chemicals above applicable discharge criteria or risk-based criteria for human health or the environment.

Groundwater that is removed during any activities (e.g., dewatering for foundations or utilities, well drilling) within the Groundwater Management Area shall be characterized in accordance with Section J.7 for proper handling and disposition. Groundwater shall be presumed to contain petroleum hydrocarbons until testing demonstrates otherwise. At a minimum, groundwater samples shall be analyzed for PAHs and TPH-Dx. The presence of liquid hydrocarbons on groundwater (including sheens) is a visible indication of impact by petroleum hydrocarbons.

Discharges from dewatering systems normally discharge to surface water (e.g., storm sewer), sanitary sewer, or the ground surface. Water may also be collected for off-site treatment/disposal. Each of these options requires approval of the Port and discharge options may be conducted under an existing Port permit or may require a new permit from the DEQ (surface water, ground surface) or City of Portland (sanitary sewer). Groundwater shall be handled in accordance with the project contract documents to prevent worker exposure and meet requirements of the Port and the regulating agency. The discharge permits may or may not require treatment prior to discharge. The presence of liquid hydrocarbons in the extracted water will likely require pre-treatment to remove the liquid hydrocarbons. The corresponding regulatory authority or disposal facility shall be contacted for the discharge/disposal requirements. Dewatering systems shall be installed and operated in a manner that allows treatment and testing of water prior to discharge. This can be achieved by either batch testing and discharge or continuous flow treatment systems with regular discharge testing. Treatment and testing requirements shall be in accordance with the requirements of the corresponding discharge permit.

Some construction activities (e.g., driven or drilled piling) may encounter groundwater without generating groundwater for discharge/disposal. In general, provided these activities do not create a preferential pathway for mixing of clean and contaminated groundwater, these activities are acceptable. Given the soil and groundwater conditions, deep foundation installation is unlikely to create a permanent pathway for groundwater mixing. Driven piling have a small chance of dragging down contaminated soil, but the quantities would be very small (on the order of a few cubic feet per piling) so would have negligible impacts for the type and concentrations of contaminants in this Management Area. Drilled foundations (such as auger-cast piles or drilled piers) have slightly greater risk of a short-term pathway for groundwater mixing, but once installed the pathway would be cut off. For planning purposes, it can be assumed that there are no restrictions on the type of foundations that can be used. Specific designs should be reviewed by an environmental professional to verify that groundwater contamination would not be exacerbated.

J.6 Unanticipated Contamination

Unanticipated contamination is material encountered during construction activities that appears contaminated¹ and was not anticipated based on the conditions described in the CMMP. If unanticipated contamination is encountered or suspected, immediately stop all work in the area of the suspected contamination and notify the Port. The Port will characterize contaminated groundwater, determine the location of re-use or disposal, obtain any necessary paperwork, and report findings as required by the VP agreements or state/federal law.

J.7 Characterization of Groundwater

Existing data presented in this appendix could be used to characterize groundwater within this Management Area. However, much of the data are old (on the order of 20 years or older) and the area is relatively large. Natural degradation and variability within the area raises the potential that petroleum hydrocarbons may not be present in specific areas where future projects may be implemented. In the event that additional sampling is needed or desired, the party implementing an activity within this Management Area shall characterize the groundwater using either or both of the following methods. Depending on the activities being implemented and the needs of the project, the implementing party will select the most appropriate method or methods.² Groundwater characterization should be conducted by an environmental professional using methods that are consistent with the standards of practice at the time of the sampling.

Method A – In Place Characterization

Groundwater in a proposed work area may be characterized in-place prior to commencing work by collecting samples and analyzing for TPH, PAHs, and possibly volatile organic compounds (VOCs) if required by the regulating agency.

Groundwater samples may be collected from existing monitoring wells, newly installed monitoring wells, or grab samples from temporary borings.

Method B – Characterization After Removal

The concentrations of chemicals in groundwater are variable within the Management Area. The implementing party may choose to wait until the groundwater is removed to characterize the material for final disposition. In that event, the groundwater must be properly stored until characterized.

¹ Contaminated groundwater is groundwater that produces fuel or chemical odors, contains an oil sheen on the surface of the water, has other visible indicators, or groundwater designated by the Port as contaminated.

² Generally, the needs of the project dictate the method selected. For example, for small volumes of groundwater (e.g., one or two drums), the existing data may be sufficient to obtain approval for disposal. If the disposal facility needs additional data and the volume is small, sampling after removal may be suitable. If dewatering may continue for a long time period, sampling prior to removal is the best approach.

Collection and storage methods that limit the potential for volatilization should be used (e.g., pumping to closed containers). Samples should be collected from the stored materials and analyzed for TPH, PAHs, and possibly VOCs. Groundwater should be stored in drums or tanks. Collect one sample from each container for chemical analysis.

J.8 Notification, Approvals, and Reporting

J.8.1 Notification and Approvals

Notification and approval of the activities covered by this CMMP shall be in accordance with the following.

- For any proposed work that deviates from this CMMP or is related to implementation of the final remedy for the Management Area, DEQ shall be notified in advance of proposed work in a Management Area. Notification shall describe the planned work, any handling and final disposition of contaminated media, and proposed deviations from the CMMP. DEQ will provide comments or approval within 30 days of notification. If comments are provided that require a response, DEQ response or approval will be provided within 15 days of receipt of response to comments.
- For any other work, advance notice to DEQ is not required.

J.8.2 Reporting

In addition to complying with any other applicable regulatory requirements, after completion of the work, a brief letter report shall be prepared to discuss any activities that require implementation of this CMMP. To the extent that reporting required for other purposes (e.g., soil profile for landfill disposal acceptance) covers relevant topics, those reports will fulfill the requirements of this section. Examples of relevant information (as applicable based on the work being done) include:

- Documentation of quantities and final disposition of soil, including a site plan if soil is left at Terminal 4;
- Copies of soil disposal receipts;
- An updated figure that will serve as an amendment to the CMMP if managed areas are no longer covered by the CMMP due to resolution;
- As applicable, a site plan showing sample locations, dewatering wells, treatment system, and discharge point; and
- Analytical laboratory reports.

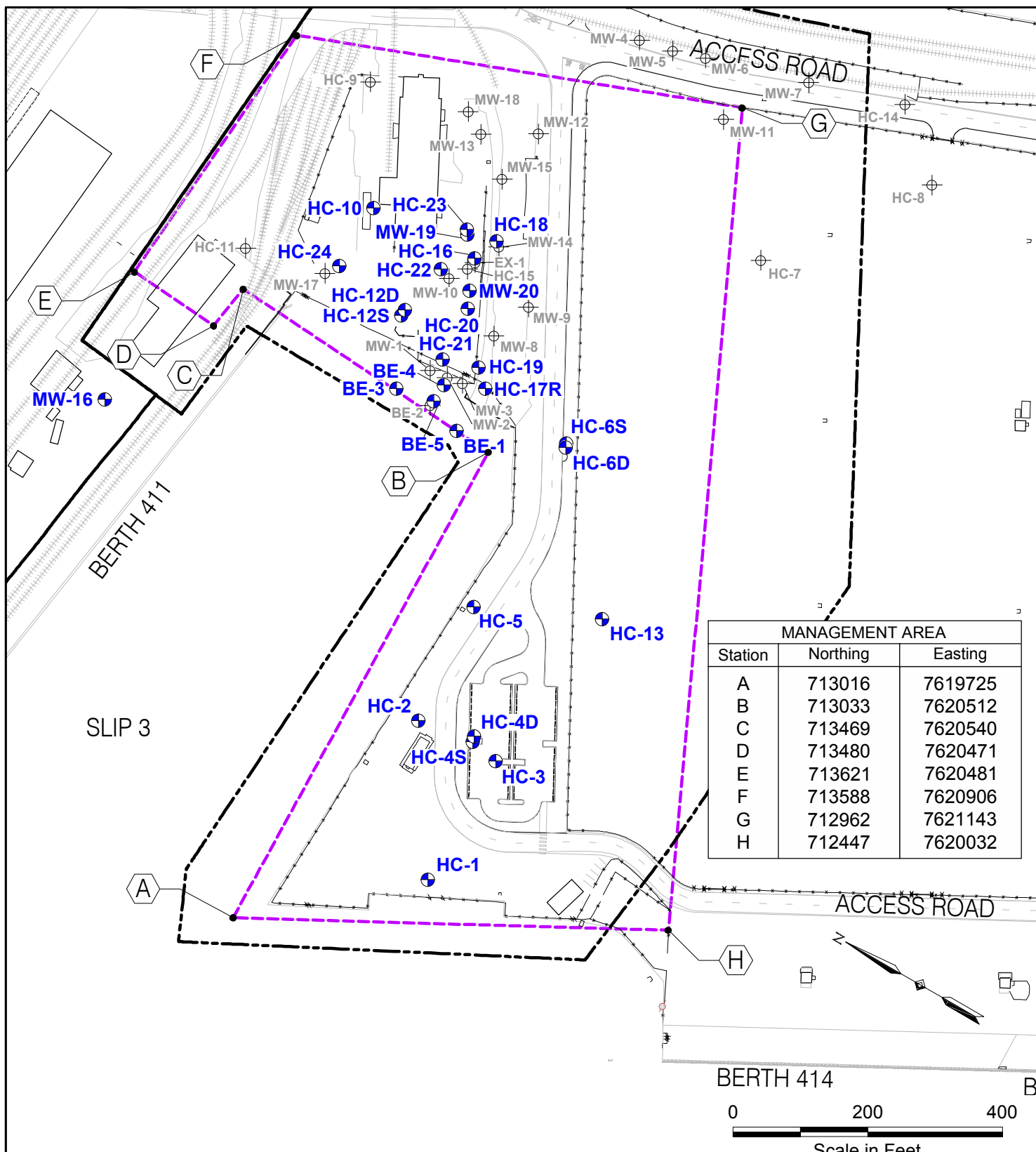
The report will identify the applicable DEQ Environmental Cleanup Site Information (ECSI) number as ECSI No. 272. The report will be maintained in the Port Terminal 4 Slip 3 Upland Facility file. For a final remedy of a Management Area, the report will be submitted to the DEQ within 60 days of completion of the work.

J.9 References

Apex, 2016. Annual 2015 Groundwater Monitoring, and LNAPL Removal Report, Terminal 4 Slip 3 Upland Facility, Portland, Oregon, ECSI No. 272. February 16, 2016.

Apex, 2017. Annual 2016 Groundwater Monitoring and LNAPL Removal Report, Terminal 4 Slip 3 Upland Facility. March 24, 2017.

Hart Crowser, 2000. *Remedial Investigation Report*, Terminal 4, Slip 3 Upland, Port of Portland, Portland, Oregon. January 21, 2000.



Legend:

- HC-1** Monitoring Well Location
- BE-2** Destroyed/Abandoned Monitoring Well Location
- SB-SS-14** Soil Boring Location
- A** Station Location

NOTES:

1. Base map prepared from Port of Portland AutoCAD file, provided 7-2013.
2. Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.

Groundwater Area

Contaminated Media Management Plan
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon



Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number **1066-10/1007-21**
March 2019

Appendix
J

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-1 (29.93)	27-Aug-2003	22.35	21.69	0.66	8.17	0.50	0.50	0.04
	3-Sep-2003	21.98	21.81	0.17	8.10	0.25	0.75	< 0.01
	11-Sep-2003	21.84	21.82	0.02	8.11	Trace	0.75	< 0.01
	17-Sep-2003	22.00	21.92	0.08	8.00	Trace	0.75	< 0.01
	30-Sep-2003	21.88	21.81	0.07	8.11	Trace	0.75	0.01
	14-Oct-2003	21.03	21.00	0.03	8.93	Trace	0.75	0.01
	29-Oct-2003	21.93	21.85	0.08	8.07	0.25	1.00	0.00
	13-Nov-2003	21.95	21.93	0.02	8.00	Trace	1.00	0.00
	26-Nov-2003	21.84	21.83	0.01	8.10	Trace	1.00	< 0.01
	24-Dec-2003	21.05	21.04	0.01	8.89	Trace	1.00	0.01
	21-Jan-2004	20.92	20.89	0.03	9.04	Trace	1.00	0.01
	25-Feb-2004	21.39	20.57	0.82	9.27	0.50	1.50	0.01
	10-Mar-2004	21.22	20.91	0.31	8.99	0.15	1.65	0.01
	24-Mar-2004	21.45	20.90	0.55	8.97	0.30	1.95	0.01
MW-2 (30.05)	27-Aug-2003	19.73	19.17	0.56	10.82	0.50	0.50	0.02
	3-Sep-2003	19.41	19.29	0.12	10.75	0.10	0.60	0.01
	11-Sep-2003	19.44	19.38	0.06	10.66	0.10	0.70	0.01
	17-Sep-2003	19.59	19.49	0.10	10.55	0.10	0.80	0.02
	30-Sep-2003	19.46	19.38	0.08	10.66	0.10	0.90	0.01
	14-Oct-2003	19.71	19.56	0.15	10.47	0.10	1.00	0.01
	29-Oct-2003	19.69	19.55	0.14	10.48	0.25	1.25	0.00
	13-Nov-2003	19.65	19.63	0.02	10.42	Trace	1.25	0.00
	26-Nov-2003	19.51	19.50	0.01	10.55	Trace	1.25	< 0.01
	24-Dec-2003	18.47	18.34	0.13	11.70	Trace	1.25	0.02
	30-Dec-2003	18.50	18.40	0.10	11.64	0.10	1.35	0.03
	9-Jan-2004	18.30	17.95	0.35	12.06	0.10	1.45	0.01
	15-Jan-2004	18.19	17.88	0.31	12.14	0.10	1.55	0.01
	21-Jan-2004	18.10	17.95	0.15	12.08	0.10	1.65	0.01
	29-Jan-2004	18.20	17.70	0.50	12.30	0.20	1.85	0.01
	3-Feb-2004	18.20	17.71	0.49	12.29	0.20	2.05	0.01
	12-Feb-2004	18.34	17.81	0.53	12.18	0.30	2.35	0.02
	18-Feb-2004	18.30	17.84	0.46	12.16	0.30	2.65	< 0.01
	25-Feb-2004	17.98	17.85	0.13	12.19	0.10	2.75	< 0.01
	3-Mar-2004	18.10	18.00	0.10	12.04	Trace	2.75	< 0.01
	10-Mar-2004	18.15	18.03	0.12	12.01	0.03	2.78	< 0.01
	18-Mar-2004	18.45	18.12	0.33	11.89	0.20	2.98	0.01
	24-Mar-2004	18.60	18.15	0.45	11.85	0.25	3.23	0.01
	1-Apr-2004	18.55	18.00	0.55	11.99	0.30	3.53	0.01
MW-3 (30.09)	27-Aug-2003	20.85	20.82	0.03	9.27	Trace	Trace	< 0.01
	3-Sep-2003	20.91	20.89	0.02	9.20	Trace	Trace	0.01
	11-Sep-2003	20.94	20.92	0.02	9.17	Trace	Trace	0.01
	17-Sep-2003	21.04	21.00	0.04	9.09	Trace	Trace	0.01
	30-Sep-2003	19.89	19.85	0.04	10.24	Trace	Trace	0.01
	14-Oct-2003	21.95	21.83	0.12	8.25	Trace	Trace	0.01
	29-Oct-2003	21.02	21.00	0.02	9.09	Trace	Trace	0.00
	13-Nov-2003	21.07	21.06	0.01	9.03	Trace	Trace	0.00
	26-Nov-2003	21.00	20.99	0.01	9.10	Trace	Trace	< 0.01
	24-Dec-2003	19.85	19.84	0.01	10.25	Trace	Trace	< 0.01
	21-Jan-2004	19.32	19.28	0.04	10.81	Trace	Trace	0.01
	25-Feb-2004	19.15	19.13	0.02	10.96	NA	Trace	0.02
	24-Mar-2004	19.86	19.80	0.06	10.28	NA	Trace	0.06
MW-8 (31.13)	27-Aug-2003	20.38	NP	0.00	10.75	0.00	0.00	0.00
	3-Sep-2003	20.45	NP	0.00	10.68	0.00	0.00	0.00
	11-Sep-2003	Not Accessible						
	17-Sep-2003	Not Accessible						
	30-Sep-2003	Not Accessible						
	14-Oct-2003	Not Accessible						
	29-Oct-2003	Not Accessible						
	13-Nov-2003	21.15	NP	0.00	9.98	0.00	0.00	0.00
	26-Nov-2003	21.05	NP	0.00	10.08	0.00	0.00	0.00
	24-Dec-2003	19.18	NP	0.00	11.95	0.00	0.00	0.00
	21-Jan-2004	18.70	NP	0.00	12.43	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-8 (continued) 								

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-13 (continued)	21-Jan-2004	17.47	NP	0.00	14.02	0.00	0.00	0.00
	25-Feb-2004	14.61	NP	0.00	16.88	0.00	0.00	0.00
	24-Mar-2004	15.91	NP	0.00	15.58	0.00	0.00	0.00
MW-14 (31.32)	27-Aug-2003	22.23	17.36	4.87	13.42	0.25	0.25	0.10
	3-Sep-2003	21.05	19.99	1.06	11.21	0.10	0.35	0.20
	11-Sep-2003	21.31	20.21	1.10	10.99	Trace	0.35	0.10
	17-Sep-2003	21.42	20.33	1.09	10.87	1.00	1.35	0.11
	30-Sep-2003	23.11	19.71	3.40	11.24	1.50	2.85	0.19
	14-Oct-2003	23.01	19.70	3.31	11.26	1.50	4.35	0.14
	29-Oct-2003	20.60	20.58	0.02	10.74	Trace	4.35	0.00
	13-Nov-2003	20.79	20.73	0.06	10.58	0.10	4.45	0.00
	26-Nov-2003	20.46	20.15	0.31	11.14	0.10	4.55	0.02
	10-Dec-2003	20.51	20.42	0.09	10.89	0.10	4.65	0.01
	24-Dec-2003	19.05	NP	0.00	12.27	0.00	4.65	0.00
	21-Jan-2004	17.20	17.19	0.01	14.13	Trace	4.65	< 0.01
	25-Feb-2004	15.51	15.47	0.04	15.85	0.00	4.65	0.04
	24-Mar-2004	14.97	14.90	0.07	16.41	0.00	4.65	0.07
	14-Jan-2005	21.60	20.00	1.60	11.14	Trace	4.65	1.60
	21-Jan-2005	--	--	--	--	--	4.65	--
	28-Jan-2005	20.27	19.00	1.27	12.18	Trace	4.65	< 0.10
	4-Feb-2005	--	19.55	--	--	Trace	4.65	< 0.10
	11-Feb-2005	19.62	19.61	0.01	11.71	Trace	4.65	0.01
	18-Feb-2005	19.64	19.64	0.00	11.68	Trace	4.65	0.00
	25-Feb-2005	20.03	20.03	0.00	11.29	Trace	4.65	0.00
	25-Mar-2005	20.32	20.32	0.00	11.00	0.00	4.65	0.00
	30-Apr-2005	--	--	--	--	--	4.65	--
	13-May-2005	19.25	NP	0.00	12.07	0.00	4.65	0.00
	31-May-2005	18.80	18.80	0.00	12.52	0.00	4.65	0.00
	24-Jun-2005	18.75	18.70	0.05	12.61	0.00	4.65	0.00
	29-Jul-2005	19.92	NP	0.00	11.40	0.00	4.65	0.00
	26-Aug-2005	--	--	--	--	--	4.65	--
	24-Sep-2005	20.52	NP	0.00	10.80	0.00	4.65	0.00
	21-Oct-2005	20.70	NP	0.00	10.62	0.00	4.65	0.00
	28-Nov-2005	20.20	NP	0.00	11.12	0.00	4.65	0.00
	3-Jan-2006	17.98	NP	0.00	13.34	0.00	4.65	0.00
	17-Feb-2006	--	15.65	--	--	--	4.65	--
	19-Sep-2006	20.43	NP	0.00	10.89	0.00	4.65	0.00
	13-Dec-2006	18.38	NP	0.00	12.94	0.00	4.65	0.00
	29-Mar-2007	17.03	17.01	0.02	14.31	0.00	4.65	0.02
	27-Jun-2007	19.28	18.90	0.38	12.38	2.50	7.15	0.01
	18-Sep-2007	20.46	20.41	0.05	10.90	0.00	7.15	0.05
	6-Dec-2007	15.75	15.75	0.00	15.57	0.00	7.15	0.00
	10-Mar-2008	17.55	SHEEN	0.00	13.77	0.00	7.15	0.02
	12-Jun-2008	15.85	15.80	0.05	15.51	0.00	7.15	0.05
	8-Sep-2008	Well inadvertently not gauged during groundwater monitoring event.						
	29-Dec-2008	13.51	13.50	0.01	17.82	0.00	7.15	0.01
	10-Mar-2009	19.02	19.01	0.01	12.31	0.00	7.15	0.01
	4-Jun-2009	18.26	FILM ON PROBE	0.00	13.06	0.00	7.15	0.00
	9-Sep-2009	20.61	20.60	0.00	10.71	0.00	7.15	0.01
	15-Dec-2009	Unable to Gauge; Under Large Puddle of Water						
	11-Mar-2010	18.08	NP	0.00	13.24	0.00	7.15	0.00
	8-Jun-2010	17.07	NP	0.00	14.25	0.00	7.15	0.00
	16-Sep-2010	19.63	NP	0.00	11.69	0.00	7.15	0.00
	13-Dec-2010	15.16	NP	0.00	16.16	0.00	7.15	0.00
	9-Jun-2011	14.99	NP	0.00	16.33	0.00	7.15	0.00
	1-Dec-2011	19.68	NP	0.00	11.64	0.00	7.15	0.00
	11-Jun-2012	16.48	NP	0.00	14.84	0.00	7.15	0.00
	19-Dec-2012	11.89	SHEEN	0.00	19.43	0.00	7.15	0.00
	17-Dec-2013	20.14	NP	0.00	11.18	0.00	7.15	0.00
	11-Dec-2014	17.38	NP	0.00	13.94	0.00	7.15	0.00
	Well Abandoned May 14, 2015							
MW-15 (31.57)	27-Aug-2003	19.83	16.23	3.60	14.94	0.00	0.00	0.00
	3-Sep-2003	17.16	16.41	0.75	15.08	0.50	0.50	0.04
	11-Sep-2003	16.98	16.63	0.35	14.90	0.10	0.60	0.02

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-15 (continued)	17-Sep-2003	17.07	16.77	0.30	14.77	0.30	0.90	0.02
	30-Sep-2003	17.00	16.71	0.29	14.83	0.40	1.30	0.03
	14-Oct-2003	17.74	17.31	0.43	14.21	0.30	1.60	0.02
	29-Oct-2003	17.98	17.50	0.48	14.02	0.50	2.10	0.01
	13-Nov-2003	18.42	18.13	0.29	13.41	0.10	2.20	0.00
	19-Nov-2003	18.10	17.92	0.18	13.63	0.20	2.40	0.02
	26-Nov-2003	18.07	17.88	0.19	13.67	0.10	2.50	< 0.01
	3-Dec-2003	17.19	17.12	0.07	14.44	Trace	2.50	0.02
	10-Dec-2003	18.20	18.10	0.10	13.46	0.10	2.60	0.01
	24-Dec-2003	15.74	15.59	0.15	15.96	Trace	2.60	0.02
	9-Jan-2004	15.86	15.66	0.20	15.89	0.10	2.70	< 0.01
	21-Jan-2004	15.30	15.22	0.08	16.34	Trace	2.70	0.01
	3-Feb-2004	15.69	15.60	0.09	15.96	0.00	2.70	0.09
	18-Feb-2004	14.56	14.53	0.03	17.04	0.00	2.70	0.03
	25-Feb-2004	14.11	14.10	0.01	17.47	0.00	2.70	0.01
	24-Mar-2004	14.72	NP	0.00	16.85	0.00	2.70	0.00
	14-Jan-2005	18.25	17.50	0.75	13.99	0.10	2.80	0.10
	21-Jan-2005	17.70	17.15	0.55	14.36	0.50	3.30	0.10
	28-Jan-2005	17.39	17.17	0.22	14.38	0.05	3.35	0.06
	4-Feb-2005	17.38	17.21	0.17	14.34	0.15	3.50	0.01
	11-Feb-2005	17.20	17.09	0.11	14.47	0.05	3.55	0.09
	18-Feb-2005	17.23	17.11	0.12	14.45	0.05	3.60	0.04
	25-Feb-2005	17.42	17.35	0.07	14.21	0.00	3.60	0.07
	4-Mar-2005	17.61	17.51	0.10	14.05	0.20	3.80	0.01
	11-Mar-2005	17.55	17.53	0.02	14.04	0.00	3.80	0.02
	25-Mar-2005	18.05	17.99	0.06	13.57	0.00	3.80	0.06
	14-Apr-2005	17.22	17.14	0.08	14.42	0.00	3.80	0.08
	30-Apr-2005	17.00	16.84	0.16	14.71	0.25	4.05	0.01
	13-May-2005	16.61	16.54	0.07	15.02	0.00	4.05	0.07
	31-May-2005	16.38	16.30	0.08	15.26	0.00	4.05	0.08
	24-Jun-2005	16.50	16.29	0.21	15.26	0.25	4.30	0.01
	8-Jul-2005	16.51	16.40	0.11	15.16	0.25	4.55	0.00
	15-Jul-2005	16.51	16.45	0.06	15.11	0.00	4.55	0.06
	29-Jul-2005	16.79	16.72	0.07	14.84	0.00	4.55	0.07
	26-Aug-2005	17.43	17.39	0.04	14.18	0.00	4.55	0.04
	24-Sep-2005	18.05	17.96	0.09	13.60	0.00	4.55	0.09
	21-Oct-2005	18.58	18.50	0.08	13.06	0.00	4.55	0.08
	28-Nov-2005	17.65	17.45	0.20	14.10	0.05	4.60	< 0.01
	14-Dec-2005	17.19	17.10	0.09	14.46	0.00	4.60	0.09
	3-Jan-2006	16.15	15.98	0.17	15.57	0.50	5.10	0.03
	17-Jan-2006	15.19	15.10	0.09	16.46	0.00	5.10	0.09
	23-Jan-2006	15.01	14.95	0.06	16.61	0.00	5.10	0.06
	17-Feb-2006	14.35	14.30	0.05	17.26	0.00	5.10	0.05
	19-Sep-2006	18.61	18.01	0.60	13.49	1.30	6.40	0.01
	13-Dec-2006	16.30	15.87	0.43	15.65	1.00	7.40	< 0.01
	29-Mar-2007	15.57	15.22	0.35	16.31	0.25	7.65	0.01
	27-Jun-2007	16.56	16.14	0.42	15.38	2.00	9.65	0.01
	18-Sep-2007	18.26	18.25	0.01	13.32	0.00	9.65	0.01
	6-Dec-2007	17.76	17.48	0.28	14.06	0.30	9.95	0.00
	10-Mar-2008	15.86	15.35	0.51	16.16	0.00	9.95	0.51
	14-Mar-2008	15.56	15.15	0.41	16.37	0.75	10.70	0.01
	13-Jun-2008	16.28	15.73	0.55	15.78	0.66	11.36	SHEEN
	8-Sep-2008	17.67	17.66	0.01	13.91	0.26	11.62	SHEEN
	29-Dec-2008	Unable to Gauge; Under Large Puddle of Water						
	10-Mar-2009	16.35	16.29	0.06	15.27	0.00	11.62	0.06
	4-Jun-2009	17.14	16.18	0.96	15.28	0.00	11.62	0.00
	13-Jul-2009	19.06	18.02	1.04	13.44	1.50	13.12	0.02
	10-Aug-2009	17.92	17.63	0.29	13.91	0.25	13.37	0.01
	9-Sep-2009	18.48	18.35	0.13	13.21	0.20	13.57	SHEEN
	15-Oct-2009	19.34	19.29	0.05	12.27	0.00	13.57	0.05
	18-Nov-2009	18.7	18.66	0.04	12.91	0.00	13.57	0.04
	15-Dec-2009	18.45	17.83	0.62	13.67	0.64	14.21	SHEEN
	13-Jan-2010	16.65	16.24	0.41	15.28	0.33	14.54	SHEEN
	21-Jan-2010	16.21	15.91	0.30	15.63	0.30	14.84	SHEEN
	26-Jan-2010	16.06	15.91	0.15	15.64	0.30	15.14	SHEEN
	5-Feb-2010	15.92	15.83	0.09	15.73	0.00	15.14	0.09

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-15 (continued)	2-Mar-2010	16.17	15.90	0.27	15.64	0.30	15.44	SHEEN
	12-Mar-2010	15.81	15.67	0.14	15.88	0.30	15.74	0.01
	25-Mar-2010	15.70	15.65	0.05	15.91	0.00	15.74	0.05
	2-Apr-2010	15.89	15.84	0.05	15.72	0.00	15.74	0.05
	9-Apr-2010	15.57	15.57	0.00	16.00	0.00	15.74	0.00
	16-Apr-2010	15.72	15.52	0.20	16.03	0.50	16.24	SHEEN
	23-Apr-2010	15.94	15.85	0.09	15.71	0.00	16.24	0.09
	4-May-2010	15.89	15.83	0.06	15.73	0.00	16.24	0.06
	8-Jun-2010	15.61	15.55	0.06	16.01	0.00	16.24	0.06
	9-Jul-2010	15.78	15.53	0.25	16.01	0.25	16.49	0.01
	23-Jul-2010	15.85	15.76	0.09	15.80	0.00	16.49	0.09
	6-Aug-2010	16.19	15.92	0.27	15.62	0.25	16.74	SHEEN
	19-Aug-2010	16.23	16.15	0.08	15.41	0.00	16.74	0.08
	27-Aug-2010	16.40	16.22	0.18	15.33	0.25	16.99	0.07
	17-Sep-2010	16.74	16.62	0.12	14.94	0.25	17.24	SHEEN
	8-Oct-2010	17.30	17.23	0.07	14.33	0.00	17.24	0.07
	11-Nov-2010	17.19	17.10	0.09	14.46	0.00	17.24	0.09
	15-Dec-2010	15.85	15.64	0.21	15.91	0.50	17.74	0.04
	21-Dec-2010	15.60	15.47	0.13	16.09	0.50	18.24	0.02
	30-Dec-2010	15.45	15.32	0.13	16.24	0.50	18.74	0.02
	6-Jan-2011	15.23	15.19	0.04	16.38	0.05	18.79	0.01
	13-Jan-2011	14.66	14.62	0.04	16.95	0.00	18.79	0.04
	19-Jan-2011	14.99	14.94	0.05	16.62	0.00	18.79	0.05
	28-Jan-2011	14.76	14.72	0.04	16.85	0.00	18.79	0.04
	9-Feb-2011	15.05	14.98	0.07	16.58	0.00	18.79	0.07
	23-Feb-2011	15.14	15.05	0.09	16.51	0.00	18.79	0.09
	9-Mar-2011	14.42	14.40	0.02	17.17	0.00	18.79	0.02
	29-Mar-2011	14.46	14.43	0.03	17.14	0.00	18.79	0.03
	21-Apr-2011	14.16	14.15	0.01	17.42	0.00	18.79	0.01
	6-May-2011	14.19	14.18	0.01	17.39	0.00	18.79	0.01
	9-Jun-2011	14.45	SHEEN	0.00	17.12	0.00	18.79	SHEEN
	7-Jul-2011	14.80	14.75	0.05	16.81	0.00	18.79	0.05
	3-Aug-2011	15.28	15.21	0.07	16.35	0.00	18.79	0.07
	8-Sep-2011	16.03	15.98	0.05	15.58	0.00	18.79	0.05
	3-Oct-2011	16.45	16.13	0.32	15.40	0.25	19.04	0.01
	10-Nov-2011	17.11	17.02	0.09	14.54	0.00	19.04	0.09
	1-Dec-2011	16.57	16.56	0.01	15.01	0.00	19.04	0.01
	16-Jan-2012	16.88	16.88	0.00	14.69	0.00	19.04	0.00
	25-Jan-2012	16.22	16.13	0.09	15.43	0.00	19.04	0.09
	3-Mar-2012	16.06	15.98	0.08	15.58	0.00	19.04	0.08
	14-Mar-2012	Well under large puddle.						
	22-Mar-2012	15.53	15.46	0.07	16.10	0.00	19.04	0.07
	29-Mar-2012	Well under large puddle.						
	5-Apr-2012	15.38	15.11	0.27	16.43	0.13	19.17	SHEEN
	13-Apr-2012	15.15	15.05	0.10	16.51	0.00	19.17	0.10
	23-Apr-2012	15.01	15.00	0.01	16.57	0.00	19.17	0.01
	14-May-2012	15.15	14.90	0.25	16.64	0.25	19.42	0.01
	25-May-2012	15.03	15.02	0.01	16.55	0.00	19.42	0.01
	12-Jun-2012	15.11	15.10	0.01	16.47	0.00	19.42	0.01
	3-Jul-2012	15.26	15.21	0.05	16.35	0.00	19.42	0.05
	23-Aug-2012	16.04	15.95	0.09	15.61	0.00	19.42	0.09
	24-Sep-2012	16.95	16.50	0.45	15.02	0.50	19.92	0.02
	8-Oct-2012	17.16	16.95	0.21	14.60	0.25	20.17	SHEEN
	14-Nov-2012	17.14	17.08	0.06	14.48	0.00	20.17	0.06
	19-Dec-2012	Well under large puddle.						
	4-Jan-2013	15.22	15.04	0.18	16.51	0.2	20.37	0.01
	18-Jan-2013	15.32	15.18	0.14	16.37	0.75	21.12	0.01
	31-Jan-2013	15.48	15.37	0.11	16.19	0.1	21.22	0.01
	6-Mar-2013	15.78	15.60	0.18	15.95	0.5	21.72	0.01
	3-Apr-2013	15.15	15.13	0.02	16.44	0.00	21.72	0.02
	6-May-2013	16.4	16.38	0.02	15.19	0.00	21.72	0.02
	12-Jun-2013	16.26	16.23	0.03	15.34	0.00	21.72	0.03
	16-Jul-2013	16.88	16.65	0.23	14.89	0.40	22.12	0.02
	26-Aug-2013	18.35	18.10	0.25	13.44	0.80	22.92	SHEEN
	25-Sep-2013	18.65	18.60	0.05	12.96	0.00	22.92	0.05
	31-Oct-2013	18.4	18.26	0.14	13.29	0.00	22.92	0.05

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-15 (continued)	27-Nov-2013	18.45	18.40	0.05	13.16	0.00	22.92	0.05
	17-Dec-2013	18.57	18.52	0.05	13.04	0.00	22.92	0.05
	11-Dec-2014	17.65	16.5	1.15	14.94	1.25	24.17	SHEEN
	Well Abandoned May 14, 2015							
MW-16 (31.24)	27-Aug-2003	18.43	18.21	0.22	13.01	0.25	0.25	< 0.01
	3-Sep-2003	18.21	18.20	0.01	13.04	Trace	0.25	0.01
	11-Sep-2003	18.28	18.27	0.01	12.97	Trace	0.25	< 0.01
	17-Sep-2003	18.31	18.30	0.01	12.94	Trace	0.25	< 0.01
	30-Sep-2003	18.23	18.21	0.02	13.03	Trace	0.25	< 0.01
	14-Oct-2003	18.31	NP	0.00	13.18	0.00	0.25	0.00
	29-Oct-2003	18.34	18.32	0.02	13.17	Trace	0.25	0.00
	13-Nov-2003	18.37	18.36	0.01	13.13	Trace	0.25	0.00
	26-Nov-2003	18.23	18.20	0.03	13.29	Trace	0.25	< 0.01
	24-Dec-2003	17.41	NP	0.00	14.08	0.00	0.25	0.00
	21-Jan-2004	17.04	17.03	0.01	14.46	Trace	0.25	< 0.01
	25-Feb-2004	17.08	17.07	0.01	14.42	0.00	0.25	0.01
	24-Mar-2004	18.61	18.60	0.01	12.89	0.00	0.25	0.01
MW-17 (28.40)	27-Aug-2003	18.00	17.48	0.52	10.86	0.50	0.50	0.01
	3-Sep-2003	17.85	17.61	0.24	10.76	0.10	0.60	0.01
	11-Sep-2003	18.07	17.98	0.09	10.41	Trace	0.60	< 0.01
	17-Sep-2003	18.20	18.05	0.15	10.33	Trace	0.60	< 0.01
	30-Sep-2003	18.18	18.00	0.18	10.38	Trace	0.60	< 0.01
	14-Oct-2003	18.60	18.52	0.08	9.87	Trace	0.60	0.01
	29-Oct-2003	18.56	18.51	0.05	9.88	Trace	0.60	0.00
	13-Nov-2003	18.74	18.71	0.03	9.69	Trace	0.60	0.01
	26-Nov-2003	18.68	18.66	0.02	9.74	Trace	0.60	0.01
	24-Dec-2003	17.31	17.29	0.02	11.11	Trace	0.60	0.01
	21-Jan-2004	15.68	NP	0.00	12.72	0.00	0.60	0.00
	25-Feb-2004	16.30	14.17	2.13	14.00	1.50	2.10	0.01
	10-Mar-2004	15.80	14.85	0.95	13.45	0.15	2.25	0.01
	24-Mar-2004	15.12	15.03	0.09	13.36	0.00	2.25	0.09
	14-Jan-2005	19.50	17.75	1.75	10.46	0.10	2.35	0.35
	21-Jan-2005	18.55	17.75	0.80	10.56	1.10	3.45	0.10
	28-Jan-2005	18.01	17.78	0.23	10.59	0.20	3.65	0.05
	4-Feb-2005	18.02	17.86	0.16	10.52	0.15	3.80	0.07
	11-Feb-2005	17.81	17.68	0.13	10.71	0.05	3.85	0.07
	18-Feb-2005	17.86	17.74	0.12	10.65	0.05	3.90	0.05
	25-Feb-2005	17.99	17.91	0.08	10.48	0.00	3.90	0.08
	4-Mar-2005	18.15	18.05	0.10	10.34	0.15	4.05	0.03
	11-Mar-2005	18.03	18.00	0.03	10.40	0.00	4.05	0.03
	25-Mar-2005	18.33	18.26	0.07	10.13	0.00	4.05	0.07
	14-Apr-2005	17.82	17.74	0.08	10.65	0.00	4.05	0.08
	30-Apr-2005	17.54	17.46	0.08	10.93	0.00	4.05	0.08
	31-May-2005	16.74	16.66	0.08	11.73	0.00	4.05	0.08
	24-Jun-2005	16.85	16.78	0.07	11.61	0.00	4.05	0.07
	29-Jul-2005	17.52	17.42	0.10	10.97	0.00	4.05	0.10
	26-Aug-2005	17.97	17.90	0.07	10.49	0.00	4.05	0.07
	24-Sep-2005	18.56	18.50	0.06	9.89	0.00	4.05	0.06
	21-Oct-2005	18.90	18.82	0.08	9.57	0.00	4.05	0.08
	28-Nov-2005	18.40	18.30	0.10	10.09	0.00	4.05	0.10
	3-Jan-2006	16.10	16.01	0.09	12.38	0.00	4.05	0.09
	17-Feb-2006	15.22	13.65	1.57	14.58	1.50	5.55	0.05
	3-Mar-2006	14.79	13.90	0.89	14.40	0.75	6.30	0.05
	19-Sep-2006	18.86	18.18	0.68	10.15	0.80	7.10	0.05
	13-Dec-2006	17.11	15.34	1.77	12.87	1.60	8.70	0.03
	29-Mar-2007	17.56	13.66	3.90	14.31	4.00	12.70	0.05
	3-May-2007	16.10	14.74	1.36	13.51	7.50	20.20	0.05
	15-May-2007	15.50	14.75	0.75	13.57	2.00	22.20	0.02
	25-May-2007	15.35	14.79	0.56	13.55	1.00	23.20	0.05
	4-Jun-2007	15.90	15.53	0.37	12.83	0.75	23.95	0.10
	13-Jun-2007	16.11	15.77	0.34	12.59	0.50	24.45	0.04
	19-Jun-2007	16.02	15.84	0.18	12.54	0.25	24.70	0.05
	27-Jun-2007	16.47	16.31	0.16	12.07	1.00	25.70	0.04
	9-Jul-2007	16.75	16.66	0.09	11.73	0.00	25.70	0.09

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-17 (continued)	25-Jul-2007	17.01	16.87	0.14	11.51	0.10	25.80	0.10
	9-Aug-2007	17.42	17.24	0.18	11.14	0.15	25.95	0.10
	22-Aug-2007	17.66	17.57	0.09	10.82	0.00	25.95	0.09
	7-Sep-2007	17.97	17.90	0.07	10.49	0.00	25.95	0.07
	14-Sep-2007	17.84	17.70	0.14	10.68	0.50	26.45	0.01
	18-Sep-2007	18.23	18.19	0.04	10.21	0.00	26.45	0.04
	4-Oct-2007	18.50	18.46	0.04	9.94	0.00	26.45	0.04
	11-Oct-2007	18.55	18.51	0.04	9.89	0.00	26.45	0.04
	24-Oct-2007	18.65	18.60	0.05	9.79	0.00	26.45	0.05
	8-Nov-2007	18.77	18.72	0.05	9.67	0.00	26.45	0.05
	21-Nov-2007	18.71	18.65	0.06	9.74	0.00	26.45	0.06
	7-Dec-2007	17.79	17.50	0.29	10.87	0.40	26.85	0.06
	21-Dec-2007	17.40	16.96	0.44	11.39	0.40	27.25	0.00
	3-Jan-2008	16.00	15.19	0.81	13.12	1.00	28.25	0.04
	18-Jan-2008	15.80	14.48	1.32	13.77	1.50	29.75	0.01
	24-Jan-2008	14.96	14.39	0.57	13.95	0.90	30.65	SHEEN
	31-Jan-2008	14.97	14.57	0.40	13.79	0.75	31.40	SHEEN
	6-Feb-2008	14.81	14.27	0.54	14.07	1.00	32.40	SHEEN
	15-Feb-2008	14.62	13.98	0.64	14.35	1.00	33.40	SHEEN
	29-Feb-2008	15.00	14.45	0.55	13.89	0.75	34.15	SHEEN
	10-Mar-2008	15.18	14.81	0.37	13.55	0.00	34.15	0.37
	12-Mar-2008	15.25	14.79	0.46	13.56	0.50	34.65	SHEEN
	21-Mar-2008	15.35	15.03	0.32	13.33	0.40	35.05	SHEEN
	11-Apr-2008	15.63	15.32	0.31	13.05	0.79	35.84	SHEEN
	17-Apr-2008	15.53	15.34	0.19	13.04	0.26	36.10	SHEEN
	24-Apr-2008	15.57	15.48	0.09	12.91	0.13	36.23	SHEEN
	2-May-2008	15.54	15.35	0.19	13.03	0.50	36.73	0.01
	8-May-2008	15.54	15.42	0.12	12.97	0.20	36.93	SHEEN
	14-May-2008	15.61	15.50	0.11	12.89	0.50	37.43	SHEEN
	30-May-2008	14.76	14.54	0.22	13.84	0.40	37.83	SHEEN
	13-Jun-2008	14.45	14.20	0.25	14.17	0.40	38.23	SHEEN
	25-Jun-2008	15.01	14.84	0.17	13.54	0.21	38.44	SHEEN
	11-Jul-2008	15.85	15.73	0.12	12.66	0.10	38.54	SHEEN
	28-Jul-2008	16.68	16.62	0.06	11.77	0.00	38.54	0.06
	13-Aug-2008	17.27	17.12	0.15	11.26	0.13	38.67	SHEEN
	27-Aug-2008	17.48	17.42	0.06	10.97	0.00	38.67	0.06
	8-Sep-2008	17.73	17.68	0.05	10.71	0.00	38.67	0.05
	18-Sep-2008	18.00	17.95	0.05	10.44	0.00	38.67	0.05
	30-Sep-2008	17.17	17.12	0.05	11.27	0.00	38.67	0.05
	16-Oct-2008	18.46	18.40	0.06	9.99	0.00	38.67	0.06
	30-Oct-2008	18.60	18.56	0.04	9.84	0.00	38.67	0.04
	14-Nov-2008	18.53	18.46	0.07	9.93	0.00	38.67	0.07
	26-Nov-2008	18.36	18.27	0.09	10.12	0.00	38.67	0.09
	16-Dec-2008	18.44	18.36	0.08	10.03	0.00	38.67	0.08
	29-Dec-2008	18.23	18.04	0.19	10.34	0.13	38.80	SHEEN
	15-Jan-2009	16.49	15.62	0.87	12.68	0.40	39.20	0.01
	23-Jan-2009	16.22	15.82	0.40	12.54	0.40	39.60	0.01
	29-Jan-2009	16.19	15.96	0.23	12.41	0.26	39.86	SHEEN
	4-Feb-2009	16.15	15.94	0.21	12.44	0.40	40.26	0.01
	12-Feb-2009	16.34	16.22	0.12	12.17	0.26	40.52	SHEEN
	19-Feb-2009	16.65	16.57	0.08	11.82	0.00	40.52	0.08
	10-Mar-2009	16.61	16.49	0.12	11.90	0.13	40.65	SHEEN
	27-Mar-2009	16.69	16.58	0.11	11.81	0.13	40.78	SHEEN
	16-Apr-2009	16.64	16.55	0.09	11.84	0.00	40.78	0.09
	14-May-2009	16.27	16.15	0.12	12.24	0.07	40.85	SHEEN
	4-Jun-2009	15.79	15.73	0.06	12.66	0.00	40.85	SHEEN
	13-Jul-2009	17.26	17.14	0.12	11.25	0.13	40.98	0.01
	10-Aug-2009	17.90	17.84	0.06	10.55	0.00	40.98	0.06
	9-Sep-2009	18.52	18.47	0.05	9.92	0.00	40.98	0.05
	15-Oct-2009	18.79	18.73	0.06	9.66	0.00	40.98	0.06
	18-Nov-2009	18.34	18.32	0.02	10.08	0.00	40.98	0.02
	15-Dec-2009	17.43	17.31	0.12	11.08	0.16	41.14	SHEEN
	13-Jan-2010	16.80	15.54	1.26	14.28	1.33	42.47	SHEEN
	21-Jan-2010	--	16.83	--	--	0.80	43.27	--
	26-Jan-2010	15.74	15.07	0.67	14.40	0.70	43.97	SHEEN
	5-Feb-2010	15.60	15.53	0.07	15.46	0.00	43.97	0.07

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-17 (continued)	2-Mar-2010	16.85	14.92	1.93	12.99	2.10	46.07	SHEEN
	12-Mar-2010	16.06	15.13	0.93	14.20	1.00	47.07	0.00
	25-Mar-2010	16.10	15.25	0.85	14.40	1.00	48.07	0.21
	2-Apr-2010	16.63	16.12	0.51	15.61	0.25	48.32	0.01
	9-Apr-2010	15.63	14.94	0.69	14.25	0.50	48.82	0.00
	16-Apr-2010	14.79	14.79	0.00	14.79	0.00	48.82	0.00
	23-Apr-2010	16.30	15.22	1.08	14.14	1.00	49.82	0.02
	4-May-2010	15.91	15.31	0.60	14.71	0.40	50.22	SHEEN
	8-Jun-2010	14.43	13.80	0.63	13.17	0.75	50.97	0.02
	9-Jul-2010	16.02	14.75	1.27	13.48	1.00	51.97	0.00
	23-Jul-2010	16.24	15.58	0.66	14.92	0.50	52.47	0.02
	6-Aug-2010	16.45	16.08	0.37	15.71	0.50	52.97	0.01
	19-Aug-2010	16.73	16.48	0.25	16.23	0.25	53.22	0.01
	27-Aug-2010	16.77	16.69	0.08	16.61	0.00	53.22	0.01
	17-Sep-2010	17.27	17.13	0.14	16.99	0.50	53.72	0.01
	8-Oct-2010	17.48	17.43	0.05	17.38	0.00	53.72	0.05
	11-Nov-2010	17.20	16.88	0.32	16.56	0.40	54.12	0.02
	15-Dec-2010	16.81	14.18	2.63	11.55	2.50	56.62	0.01
	21-Dec-2010	15.39	14.20	1.19	13.01	1.25	57.87	0.01
	30-Dec-2010	14.87	13.83	1.04	12.79	1.00	58.87	0.01
	6-Jan-2011	14.46	13.74	0.72	13.02	0.75	59.62	0.03
	13-Jan-2011	14.41	13.83	0.58	13.25	0.75	60.37	0.01
	19-Jan-2011	13.50	13.10	0.40	12.70	0.50	60.87	SHEEN
	28-Jan-2011	13.66	12.96	0.70	12.26	0.75	61.62	0.02
	9-Feb-2011	14.75	13.95	0.80	13.15	1.50	63.12	0.02
	23-Feb-2011	14.80	14.75	0.05	14.70	0.00	63.12	0.00
	9-Mar-2011	14.05	13.32	0.73	12.59	0.40	63.52	0.01
	29-Mar-2011	14.97	13.06	1.91	11.15	2.50	66.02	0.02
	21-Apr-2011	14.04	12.65	1.39	11.26	1.20	67.22	0.02
	6-May-2011	14.01	13.02	0.99	12.03	0.50	67.72	0.02
	9-Jun-2011	12.58	12.05	0.53	11.52	0.50	68.22	0.01
	7-Jul-2011	14.06	14.05	0.01	14.04	0.00	68.22	0.01
	3-Aug-2011	14.79	14.44	0.35	14.09	0.50	68.72	0.01
	8-Sep-2011	16.32	16.22	0.10	16.12	0.00	68.72	0.10
	3-Oct-2011	17.08	16.83	0.25	16.58	0.50	69.22	0.02
	10-Nov-2011	17.65	17.57	0.08	17.49	0.00	69.22	0.80
	1-Dec-2011	17.07	17.05	0.02	17.03	0.00	69.22	0.02
	6-Jan-2012	16.82	16.78	0.04	16.74	0.00	69.22	0.04
	25-Jan-2012	15.70	15.49	0.21	15.28	0.30	69.52	0.01
	3-Mar-2012	16.52	15.57	0.95	14.62	1.00	70.52	0.06
	14-Mar-2012	15.81	14.85	0.96	13.89	0.75	71.27	0.01
	22-Mar-2012	14.99	14.05	0.94	13.11	0.50	71.77	0.01
	29-Mar-2012	14.22	13.64	0.58	13.06	0.50	72.27	0.02
	5-Apr-2012	13.44	12.92	0.52	12.40	0.25	72.52	0.01
	13-Apr-2012	13.30	13.21	0.09	13.12	0.00	72.52	0.09
	23-Apr-2012	13.75	13.09	0.66	12.43	0.50	73.02	0.01
	14-May-2012	13.85	13.05	0.80	12.25	0.50	73.52	0.02
	25-May-2012	13.16	13.15	0.01	13.14	0.00	73.52	0.01
	12-Jun-2012	14.16	13.40	0.76	12.64	0.75	74.27	0.01
	3-Jul-2012	14.04	13.69	0.35	13.34	0.25	74.52	0.01
	23-Aug-2012	16.50	16.21	0.29	15.92	0.25	74.77	0.01
	24-Sep-2012	17.25	17.05	0.20	16.85	0.25	75.02	SHEEN
	8-Oct-2012	17.47	17.44	0.03	17.41	0.00	75.02	0.03
	14-Nov-2012	16.95	16.91	0.04	16.87	0.00	75.02	0.04
	20-Dec-2012	15.45	13.51	1.94	11.57	2.00	77.02	0.01
	4-Jan-2013	15.11	13.59	1.52	12.07	1.75	78.77	0.01
	18-Jan-2013	14.80	14.01	0.79	13.22	0.75	79.52	0.01
	31-Jan-2013	15.01	14.49	0.52	13.97	0.40	79.92	0.01
	6-Mar-2013	15.82	15.33	0.49	14.84	0.80	80.72	0.01
	3-Apr-2013	16.25	16.15	0.10	16.05	0.50	81.22	0.01
	6-May-2013	16.17	16.04	0.13	15.91	0.20	81.42	0.01
	12-Jun-2013	16.39	16.04	0.35	15.69	0.50	81.92	SHEEN
	16-Jul-2013	16.97	16.73	0.24	16.49	0.20	82.12	0.01
	26-Aug-2013	17.78	17.59	0.19	17.40	0.10	82.22	0.01
	25-Sep-2013	18.13	18.11	0.02	18.09	0.00	82.22	0.02
	31-Oct-2013	18.00	17.93	0.07	17.86	0.00	82.22	0.07

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-17 (continued)	27-Nov-2013	18.01	17.87	0.14	17.73	0.10	82.32	0.01
	17-Dec-2013	17.92	17.85	0.07	17.78	0.00	82.32	0.07
	11-Dec-2014	16.66	16.48	0.18	15.07	0.20	88.27	SHEEN
	29-Jan-2015	16.90	16.55	0.35	14.98	0.70	88.97	SHEEN
	27-Feb-2015	16.70	16.50	0.20	15.05	0.40	89.37	SHEEN
	27-Mar-2015	18.08	14.72	3.36	16.48	3.00	92.37	0.01
	28-Apr-2015	17.01	15.01	2.00	16.34	3.00	95.37	SHEEN
Well Abandoned May 14, 2015								
MW-19 (30.73)	27-Aug-2003	21.43	18.61	2.82	11.81	2.00	2.00	0.12
	3-Sep-2003	19.55	18.91	0.64	11.75	0.50	2.50	0.02
	11-Sep-2003	19.38	19.28	0.10	11.44	0.10	2.60	0.01
	17-Sep-2003	19.55	19.46	0.09	11.26	0.10	2.70	0.01
	30-Sep-2003	19.65	19.57	0.08	11.15	Trace	2.70	0.02
	14-Oct-2003	19.76	19.66	0.10	11.06	Trace	2.70	0.01
	29-Oct-2003	19.77	19.65	0.12	11.07	0.10	2.80	0.02
	13-Nov-2003	19.91	19.86	0.05	10.86	Trace	2.80	0.00
	26-Nov-2003	19.80	19.74	0.06	10.98	Trace	2.80	< 0.01
	24-Dec-2003	19.18	18.07	1.11	12.54	0.20	3.00	0.06
	30-Dec-2003	19.15	18.10	1.05	12.51	0.20	3.20	0.02
	9-Jan-2004	19.41	15.41	4.00	14.88	0.30	3.50	0.02
	15-Jan-2004	19.15	15.59	3.56	14.75	1.90	5.40	0.07
	21-Jan-2004	17.34	15.34	2.00	15.17	1.00	6.40	0.02
	24-Jan-2004	16.55	14.96	1.59	15.60	0.80	7.20	0.01
	3-Feb-2004	17.70	14.45	3.25	15.92	1.00	8.20	0.01
	12-Feb-2004	16.75	14.60	2.15	15.89	1.00	9.20	0.01
	18-Feb-2004	16.17	14.85	1.32	15.73	0.90	10.10	< 0.01
	25-Feb-2004	15.12	14.71	0.41	15.97	0.30	10.40	< 0.01
	3-Mar-2004	15.25	14.99	0.26	15.71	0.10	10.50	0.01
	10-Mar-2004	15.60	15.03	0.57	15.64	0.40	10.90	0.02
	19-Mar-2004	15.85	15.08	0.77	15.57	0.50	11.40	0.01
	24-Mar-2004	15.90	15.22	0.68	15.44	0.40	11.80	0.01
	1-Apr-2004	16.55	15.61	0.94	15.02	0.60	12.40	0.01
	14-Jan-2005	--	--	--	--	--	--	--
	21-Jan-2005	20.10	19.00	1.10	11.61	0.75	13.15	0.10
	28-Jan-2005	19.22	19.10	0.12	11.62	Trace	13.15	0.03
	4-Feb-2005	19.17	19.08	0.09	11.64	0.00	13.15	0.09
	18-Feb-2005	19.06	18.97	0.09	11.75	0.00	13.15	0.09
	25-Feb-2005	19.35	19.24	0.11	11.48	0.05	13.20	0.03
	11-Mar-2005	19.35	19.31	0.04	11.42	0.00	13.20	0.04
	25-Mar-2005	19.69	19.61	0.08	11.11	0.00	13.20	0.08
	30-Apr-2005	19.36	18.91	0.45	11.77	0.25	13.45	0.00
	13-May-2005	18.88	18.56	0.32	12.13	0.25	13.70	0.03
	31-May-2005	19.00	18.00	1.00	12.62	1.00	14.70	0.05
	24-Jun-2005	19.32	18.11	1.21	12.49	1.50	16.20	0.08
	8-Jul-2005	19.40	18.42	0.98	12.20	0.75	16.95	0.01
	15-Jul-2005	18.87	18.64	0.23	12.06	0.10	17.05	0.01
	22-Jul-2005	19.93	19.86	0.07	10.86	0.00	17.05	0.07
	29-Jul-2005	19.00	18.93	0.07	11.79	0.00	17.05	0.07
	12-Aug-2005	19.34	19.18	0.16	11.53	0.10	17.15	0.02
	26-Aug-2005	19.44	19.39	0.05	11.33	0.00	17.15	0.05
	24-Sep-2005	19.84	19.75	0.09	10.97	0.00	17.15	0.09
	21-Oct-2005	20.00	19.99	0.01	10.74	0.00	17.15	0.01
	28-Nov-2005	19.55	19.42	0.13	11.30	0.05	17.20	< 0.01
	14-Dec-2005	19.65	19.22	0.43	11.46	0.10	17.30	0.08
	21-Dec-2005	19.16	18.82	0.34	11.87	0.50	17.80	0.10
	3-Jan-2006	20.15	17.35	2.80	13.07	2.50	20.30	0.10
	11-Jan-2006	17.40	15.00	2.40	15.47	2.50	22.80	0.10
	17-Jan-2006	15.75	14.46	1.29	16.13	1.10	23.90	0.03
	23-Jan-2006	15.38	14.50	0.88	16.13	0.70	24.60	0.10
	31-Jan-2006	14.92	14.33	0.59	16.34	0.20	24.80	0.08
	17-Feb-2006	15.25	14.43	0.82	16.21	1.50	26.30	0.04
	24-Feb-2006	15.11	14.62	0.49	16.06	1.50	27.80	0.03
	3-Mar-2006	15.23	14.57	0.66	16.09	0.50	28.30	0.03
	14-Mar-2006	16.19	14.95	1.24	15.64	0.75	29.05	0.05
	21-Mar-2006	15.66	14.89	0.77	15.76	0.50	29.55	0.10
	31-Mar-2006	15.48	14.89	0.59	15.78	0.30	29.85	0.02

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-19 (continued)	6-Apr-2006	15.45	15.21	0.24	15.49	0.20	30.05	0.01
	14-Apr-2006	15.04	14.81	0.23	15.89	0.20	30.25	0.10
	24-Apr-2006	15.19	14.75	0.44	15.93	0.25	30.50	0.01
	9-May-2006	15.58	14.98	0.60	15.68	0.70	31.20	0.07
	19-May-2006	15.50	15.02	0.48	15.66	0.90	32.10	0.01
	25-May-2006	15.41	15.06	0.35	15.63	0.70	32.80	0.01
	2-Jun-2006	15.33	15.10	0.23	15.60	0.30	33.10	0.03
Product Skimmer Installed in Well								
	9-Jun-2006	--	--	--	--	0.25	33.35	--
	19-Jun-2006	--	--	--	--	0.15	33.50	--
	28-Jun-2006	--	--	--	--	0.20	33.70	--
	3-Jul-2006	--	--	--	--	0.10	33.80	--
	10-Jul-2006	--	--	--	--	0.10	33.90	--
	18-Jul-2006	--	--	--	--	0.20	34.10	--
	25-Jul-2006	--	--	--	--	0.40	34.50	--
	4-Aug-2006	--	--	--	--	0.10	34.60	--
	11-Aug-2006	--	--	--	--	0.90	35.50	--
	18-Aug-2006	--	--	--	--	0.30	35.80	--
	23-Aug-2006	--	--	--	--	0.10	35.90	--
	8-Sep-2006	--	--	--	--	0.05	35.95	--
	20-Sep-2006	--	--	--	--	0.10	36.05	--
	3-Oct-2006	--	--	--	--	0.05	36.10	--
	6-Nov-2006	--	--	--	--	0.05	36.15	--
	22-Nov-2006	--	--	--	--	0.00	36.15	--
	4-Dec-2006	--	--	--	--	1.90	38.05	--
	13-Dec-2006	--	--	--	--	1.30	39.35	--
	18-Dec-2006	--	--	--	--	1.00	40.35	--
	26-Dec-2006	--	--	--	--	1.10	41.45	--
	9-Jan-2007	--	--	--	--	1.20	42.65	--
	15-Jan-2007	--	--	--	--	1.00	43.65	--
	26-Jan-2007	--	--	--	--	1.10	44.75	--
	31-Jan-2007	--	--	--	--	1.10	45.85	--
	9-Feb-2007	--	--	--	--	1.00	46.85	--
	13-Feb-2007	--	--	--	--	1.00	47.85	--
	28-Feb-2007	--	--	--	--	1.10	48.95	--
	6-Mar-2007	--	--	--	--	1.20	50.15	--
	23-Mar-2007	--	--	--	--	4.00	54.15	--
	29-Mar-2007	--	--	--	--	5.00	59.15	--
	5-Apr-2007	--	--	--	--	0.50	59.65	--
	11-Apr-2007	--	--	--	--	0.40	60.05	--
	16-Apr-2007	--	--	--	--	8.20	68.25	--
	25-Apr-2007	--	--	--	--	0.80	69.05	--
	3-May-2007	--	--	--	--	5.00	74.05	--
	10-May-2007	--	--	--	--	0.90	74.95	--
	15-May-2007	--	--	--	--	0.50	75.45	--
	25-May-2007	--	--	--	--	0.25	75.70	--
	4-Jun-2007	--	--	--	--	0.75	76.45	--
	13-Jun-2007	--	--	--	--	0.20	76.65	--
	19-Jun-2007	--	--	--	--	0.10	76.75	--
	27-Jun-2007	--	--	--	--	1.00	77.75	--
	9-Jul-2007	--	--	--	--	1.20	78.95	--
	25-Jul-2007	--	--	--	--	0.10	79.05	--
	9-Aug-2007	--	--	--	--	0.15	79.20	--
	22-Aug-2007	--	--	--	--	0.00	79.20	--
	7-Sep-2007	--	--	--	--	0.10	79.30	--
	14-Sep-2007	--	--	--	--	0.10	79.40	--
	19-Sep-2007	--	--	--	--	0.00	79.40	--
	4-Oct-2007	--	--	--	--	0.10	79.50	--
	11-Oct-2007	--	--	--	--	0.00	79.50	--
	24-Oct-2007	--	--	--	--	0.10	79.60	--
	8-Nov-2007	--	--	--	--	0.10	79.70	--
	21-Nov-2007	--	--	--	--	0.00	79.70	--
	7-Dec-2007	--	--	--	--	0.05	79.75	--
	21-Dec-2007	--	--	--	--	0.05	79.80	--

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-19 (continued)	3-Jan-2008	17.59	16.98	0.61	--	1.50	81.30	0.04
	18-Jan-2008	17.94	16.25	1.69	--	2.75	84.05	SHEEN
	24-Jan-2008	16.29	15.52	0.77	--	2.00	86.05	SHEEN
	31-Jan-2008	16.48	15.37	1.11	--	2.50	88.55	SHEEN
	6-Feb-2008	16.88	15.07	1.81	--	4.00	92.55	SHEEN
	15-Feb-2008	15.54	14.75	0.79	--	2.75	95.30	SHEEN
	29-Feb-2008	17.00	14.71	2.29	--	2.50	97.80	SHEEN
	14-Mar-2008	16.89	14.88	2.01	--	2.50	100.30	--
	21-Mar-2008	15.67	15.19	0.48	--	2.25	102.55	SHEEN
	11-Apr-2008	15.87	15.45	0.42	--	1.00	103.55	SHEEN
	17-Apr-2008	15.63	15.50	0.13	--	0.66	104.21	SHEEN
	24-Apr-2008	15.89	15.88	0.01	--	0.40	104.61	0.01
	2-May-2008	16.12	16.10	0.02	--	0.25	104.86	0.02
	8-May-2008	16.35	16.32	0.03	--	0.13	104.99	0.03
	14-May-2008	17.01	17.00	0.01	--	0.00	104.99	0.01
	30-May-2008	16.13	16.12	0.01	--	0.60	105.59	0.01
	13-Jun-2008	15.64	15.63	0.01	--	0.13	105.72	SHEEN
	25-Jun-2008	16.92	16.91	0.01	--	0.00	105.72	0.01
	11-Jul-2008	16.82	16.81	0.01	--	0.05	105.78	0.01
	28-Jul-2008	17.88	17.82	0.06	--	0.00	105.78	0.06
	13-Aug-2008	18.31	18.28	0.03	--	0.07	105.84	0.03
	27-Aug-2008	19.07	19.00	0.07	--	0.07	105.91	0.07
	8-Sep-2008	19.43	19.19	0.24	--	0.26	106.17	0.01
	18-Sep-2008	19.66	19.65	0.01	--	0.00	106.17	0.01
	30-Sep-2008	20.02	20.01	0.01	--	0.00	106.17	0.01
	16-Oct-2008	20.42	20.40	0.02	--	0.00	106.17	0.02
	30-Oct-2008	20.41	20.41	0.00	--	0.05	106.22	0.00
	14-Nov-2008	20.80	20.80	0.00	--	0.01	106.23	0.00
	26-Nov-2008	20.42	20.42	0.00	--	0.00	106.23	0.00
	16-Dec-2008	20.68	20.67	0.01	--	0.00	106.23	0.01
	29-Dec-2008	19.45	19.45	0.00	--	0.00	106.23	SHEEN
	15-Jan-2009	18.60	16.96	1.64	--	1.19	107.42	SHEEN
	23-Jan-2009	17.12	17.12	0.00	--	0.08	107.50	SHEEN
	29-Jan-2009	17.30	17.29	0.01	--	0.26	107.76	SHEEN
	4-Feb-2009	17.24	17.24	0.00	--	0.66	108.42	0.01
	12-Feb-2009	17.33	17.33	0.00	--	0.53	108.95	SHEEN
	19-Feb-2009	19.34	19.30	0.04	--	0.00	108.95	0.04
	10-Mar-2009	18.97	18.94	0.03	--	0.00	108.95	0.03
	27-Mar-2009	18.74	18.70	0.04	--	0.05	109.00	0.04
	16-Apr-2009	19.00	18.99	0.01	--	0.00	109.00	0.01
	14-May-2009	18.46	18.45	0.01	--	0.00	109.00	0.01
	5-Jun-2009	17.88	17.86	0.02	--	0.03	109.03	SHEEN
	13-Jul-2009	19.34	19.30	0.04	--	0.04	109.07	0.04
	10-Aug-2009	20.15	20.09	0.06	--	0.00	109.07	0.06
	9-Sep-2009	21.60	21.52	0.08	--	0.00	109.07	0.08
	15-Oct-2009	20.73	20.72	0.01	--	0.00	109.07	0.01
	18-Nov-2009	20.53	20.53	0.00	--	0.00	109.07	0.00
	16-Dec-2009	19.03	19.03	0.00	--	0.00	109.07	SHEEN
	13-Jan-2010	21.65	17.75	3.90	--	5.00	114.07	SHEEN
	21-Jan-2010	20.26	16.82	3.44	--	3.10	117.17	SHEEN
	26-Jan-2010	--	--	--	--	1.10	118.27	--
	5-Feb-2010	--	--	--	--	0.90	119.17	SHEEN
	2-Mar-2010	23.70	15.72	7.98	--	10.75	129.92	0.03
	12-Mar-2010	17.36	15.51	1.85	--	3.50	133.42	0.01
	25-Mar-2010	19.13	16.10	3.03	--	3.00	136.42	--
	2-Apr-2010	17.33	17.33	SHEEN	--	1.00	137.42	SHEEN
	9-Apr-2010	17.35	15.31	2.04	--	2.50	139.92	0.01
	16-Apr-2010	17.43	15.32	2.11	--	2.50	142.42	0.06
	23-Apr-2010	17.23	15.72	1.51	--	2.00	144.42	0.01
	4-May-2010	19.86	15.94	3.92	--	3.25	147.67	0.03
	8-Jun-2010	16.19	14.98	1.21	--	1.50	149.17	0.05
	9-Jul-2010	22.54	15.25	7.29	--	5.50	154.67	0.09
	23-Jul-2010	17.12	15.73	1.39	--	3.25	157.92	0.01
	6-Aug-2010	17.06	16.38	0.68	--	1.25	159.17	0.01
	19-Aug-2010	17.51	17.48	0.03	--	0.50	159.67	0.01
	27-Aug-2010	18.01	17.97	0.04	--	0.00	159.67	0.01

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-19 (continued)	17-Sep-2010	18.75	18.68	0.07	--	0.25	159.92	0.01
	8-Oct-2010	18.60	18.58	0.02	--	0.20	160.12	0.02
	11-Nov-2010	18.95	18.88	0.07	--	0.00	160.12	0.07
	15-Dec-2010	20.10	15.51	4.59	--	4.75	164.87	0.02
	21-Dec-2010	18.49	15.20	3.29	--	3.00	167.87	0.04
	30-Dec-2010	18.90	16.09	2.81	--	3.00	170.87	0.02
	6-Jan-2011	15.90	14.65	1.25	--	2.25	173.12	0.03
	13-Jan-2011	16.30	16.07	0.23	--	2.50	175.62	0.01
	19-Jan-2011	15.53	14.62	0.91	--	2.25	177.87	0.01
	28-Jan-2011	14.43	14.34	0.09	--	0.15	178.02	0.09
	9-Feb-2011	15.62	14.51	1.11	--	2.50	180.52	0.02
	23-Feb-2011	14.80	14.75	0.05	--	--	180.52	0.00
	9-Mar-2011	14.57	14.16	0.41	--	0.85	181.37	SHEEN
	29-Mar-2011	14.21	13.86	0.35	--	1.25	182.62	0.02
	21-Apr-2011	13.90	13.78	0.12	--	0.60	183.22	0.02
	6-May-2011	14.06	14.00	0.06	--	0.00	183.22	0.06
	9-Jun-2011	13.93	13.86	0.07	--	0.00	183.22	0.07
	7-Jul-2011	14.23	14.09	0.14	--	0.25	183.47	0.01
	3-Aug-2011	14.52	14.48	0.04	--	0.00	183.47	0.04
	8-Sep-2011	15.98	15.91	0.07	--	0.00	183.47	0.07
	3-Oct-2011	15.79	15.67	0.12	--	0.20	183.67	0.03
	10-Nov-2011	16.80	16.73	0.07	--	0.00	183.67	0.07
	1-Dec-2011	16.02	16.02	SHEEN	--	0.00	183.67	SHEEN
	6-Jan-2012	Well buried under asphalt pile.						
	25-Jan-2012	Well buried under asphalt pile.						
	3-Mar-2012	Well buried under asphalt pile.						
	6-Mar-2012	18.75	14.98	3.77	--	3.00	186.67	SHEEN
	14-Mar-2012	Well under large puddle.						
	22-Mar-2012	15.57	14.45	1.12	--	1.00	187.67	0.01
	29-Mar-2012	Well under large puddle.						
	5-Apr-2012	15.66	15.33	0.33	--	0.87	188.54	0.01
	13-Apr-2012	14.33	14.24	0.09	--	0.10	188.64	0.09
	23-Apr-2012	14.26	14.25	0.01	--	0.13	188.77	0.01
	14-May-2012	14.20	14.19	0.01	--	0.05	188.82	0.01
	25-May-2012	14.29	14.29	SHEEN	--	0.00	188.82	SHEEN
	12-Jun-2012	14.30	--	0.00	--	0.00	188.82	0.00
	3-Jul-2012	14.64	14.62	0.02	--	0.00	188.82	0.00
	23-Aug-2012	15.80	15.35	0.45	--	0.50	189.32	0.05
	24-Sep-2012	16.16	16.00	0.16	--	0.75	190.07	0.02
	8-Oct-2012	16.68	16.61	0.07	--	0.25	190.32	0.07
	14-Nov-2012	16.39	16.38	0.01	--	0.25	190.57	0.01
	20-Dec-2012	14.81	14.32	0.49	--	0.75	191.32	0.02
	4-Jan-2013	14.19	14.17	0.02	--	0.25	191.57	0.02
	18-Jan-2013	14.59	14.58	0.01	--	0.25	191.82	0.02
	31-Jan-2013	14.74	14.74	0.00	--	0.00	191.82	0.00
	6-Mar-2013	15.22	15.16	0.06	--	0.60	192.42	0.01
	3-Apr-2013	15.98	15.48	0.50	--	0.85	193.27	0.01
	6-May-2013	16.72	15.98	0.74	--	1.50	194.77	0.01
	12-Jun-2013	16.39	16.00	0.39	--	2.50	197.27	0.01
	16-Jul-2013	16.65	16.38	0.27	--	0.40	197.67	0.03
	26-Aug-2013	17.80	17.63	0.17	--	0.50	198.17	0.01
	25-Sep-2013	20.15	20.13	0.02	--	0.00	198.17	0.02
	31-Oct-2013	17.50	17.42	0.08	--	0.00	198.17	0.08
	27-Nov-2013	17.84	17.77	0.07	--	0.00	198.17	0.07
	17-Dec-2013	16.80	16.68	0.12	--	0.20	198.37	0.01
	27-Jan-2014	18.60	16.55	2.05	--	2.00	200.37	0.05
	27-Feb-2014	16.15	16.05	0.10	--	0.10	200.47	0.01
	26-Mar-2014	18.30	15.53	2.77	--	1.00	201.47	0.03
	15-Apr-2014	16.30	14.92	1.38	--	0.50	201.97	0.01
	9-May-2014	15.86	14.68	1.18	--	1.50	203.47	SHEEN
	30-Jun-2014	16.90	15.60	1.30	--	2.50	205.97	SHEEN
	16-Jul-2014	14.95	14.20	0.75	--	0.25	206.22	SHEEN
	4-Aug-2014	16.55	16.05	0.50	--	0.50	206.72	0.00
	30-Sep-2014	18.10	17.30	0.80	--	1.50	208.22	SHEEN
	27-Oct-2014	17.80	17.50	0.30	--	0.25	208.47	SHEEN

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-19 (continued)	24-Nov-2014	19.20	17.85	1.35	--	2.00	210.47	SHEEN
	11-Dec-2014	17.43	17.30	0.13	--	0.25	210.72	SHEEN
	29-Jan-2015	16.15	16.10	0.05	--	0.20	210.92	SHEEN
	27-Feb-2015	17.95	17.75	0.20	--	0.40	211.32	SHEEN
	27-Mar-2015	20.14	15.05	5.09	--	4.25	215.57	0.06
	28-Apr-2015	20.27	19.57	0.70	--	2.00	217.57	0.02
	29-May-2015	17.90	17.30	0.60	--	2.00	219.57	0.01
	23-Jun-2015	17.20	17.12	0.08	--	0.00	219.57	0.08
	8-Jul-2015	17.46	17.33	0.13	--	0.50	220.07	0.01
	12-Aug-2015	18.09	17.97	0.12	--	3.00	223.07	0.02
	11-Sep-2015	18.46	18.32	0.14	--	1.50	224.57	SHEEN
	15-Oct-2015	19.04	18.85	0.19	--	1.00	225.57	SHEEN
	10-Nov-2015	18.80	18.60	0.20	--	1.50	227.07	SHEEN
	16-Dec-2015	17.35	17.20	0.15	--	1.00	228.07	SHEEN
	21-Jan-2016	15.41	14.05	1.36	--	2.00	230.07	0.05
	17-Feb-2016	14.80	13.95	0.85	--	2.00	232.07	0.04
	29-Mar-2016	14.16	13.84	0.32	--	0.50	232.57	SHEEN
	27-Apr-2016	14.35	14.20	0.15	--	0.25	232.82	0.30
	27-May-2016	14.65	14.53	0.12	--	0.25	233.07	0.01
	29-Jun-2016	15.07	15.00	0.07	--	0.00	233.07	0.07
	20-Jul-2016	15.69	15.50	0.19	--	0.25	233.32	0.04
	31-Aug-2016	16.45	16.20	0.25	--	0.45	233.77	0.02
	16-Sep-2016	16.48	16.31	0.17	--	0.60	234.37	0.05
	20-Oct-2016	16.66	16.65	0.01	--	0.50	234.87	0.00
	28-Nov-2016	16.60	15.08	1.52	--	1.00	235.87	0.05
	19-Dec-2016	15.10	14.61	0.49	--	0.75	236.62	0.00
MW-20 (30.73)	27-Aug-2003	20.58	19.46	1.12	11.15	2.00	2.00	0.04
	3-Sep-2003	19.99	19.59	0.40	11.10	0.50	2.50	0.03
	11-Sep-2003	20.15	19.91	0.24	10.79	0.50	3.00	0.01
	17-Sep-2003	20.27	19.99	0.28	10.71	0.50	3.50	0.01
	30-Sep-2003	20.32	20.17	0.15	10.54	0.10	3.60	< 0.01
	14-Oct-2003	20.38	20.26	0.12	10.46	0.10	3.70	< 0.01
	29-Oct-2003	20.36	20.21	0.15	10.50	0.10	3.80	0.00
	13-Nov-2003	20.45	20.37	0.08	10.35	0.10	3.90	0.01
	26-Nov-2003	20.41	20.35	0.06	10.37	0.10	4.00	0.02
	24-Dec-2003	20.66	18.68	1.98	11.83	0.30	4.30	0.04
	30-Dec-2003	20.69	18.75	1.94	11.77	0.20	4.50	0.01
	9-Jan-2004	20.71	18.88	1.83	11.65	0.10	4.60	0.01
	15-Jan-2004	20.70	17.66	3.04	12.74	1.50	6.10	0.04
	21-Jan-2004	19.22	16.14	3.08	14.25	1.50	7.60	0.03
	29-Jan-2004	19.90	15.55	4.35	14.70	2.00	9.60	0.01
	3-Feb-2004	20.90	15.42	5.48	14.71	2.50	12.10	0.01
	12-Feb-2004	18.05	15.40	2.65	15.04	1.50	13.60	0.02
	18-Feb-2004	19.02	15.62	3.40	14.74	2.20	15.80	< 0.01
	25-Feb-2004	16.56	15.44	1.12	15.17	0.70	16.50	< 0.01
	3-Mar-2004	16.95	15.85	1.10	14.76	0.50	17.00	0.01
	10-Mar-2004	17.66	16.00	1.66	14.55	1.00	18.00	0.02
	18-Mar-2004	17.29	15.92	1.37	14.66	0.75	18.75	0.02
	24-Mar-2004	17.75	16.20	1.55	14.36	1.00	19.75	< 0.01
	1-Apr-2004	17.78	16.92	0.86	13.72	0.50	20.25	< 0.01
	14-Jan-2005	20.70	19.75	0.95	10.88	1.20	21.45	0.01
	21-Jan-2005	20.00	19.60	0.40	11.09	1.20	22.65	0.10
	28-Jan-2005	19.70	19.50	0.20	11.21	0.10	22.75	0.05
	4-Feb-2005	19.73	19.61	0.12	11.11	0.05	22.80	0.06
	11-Feb-2005	19.48	19.38	0.10	11.34	0.05	22.85	0.03
	18-Feb-2005	19.51	19.45	0.06	11.27	0.00	22.85	0.06
	25-Feb-2005	19.77	19.69	0.08	11.03	0.00	22.85	0.08
	11-Mar-2005	19.89	19.82	0.07	10.90	0.20	23.05	< 0.01
	25-Mar-2005	20.18	20.12	0.06	10.60	0.00	23.05	0.06
	30-Apr-2005	19.49	19.45	0.04	11.28	0.00	23.05	0.04
	31-May-2005	18.65	18.60	0.05	12.12	0.00	23.05	0.05

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-20 (continued)	24-Jun-2005	21.02	18.57	2.45	11.89	3.00	26.05	0.00
	8-Jul-2005	20.10	18.95	1.15	11.65	1.00	27.05	0.05
	15-Jul-2005	19.62	19.14	0.48	11.54	0.25	27.30	0.05
	22-Jul-2005	19.61	19.33	0.28	11.37	2.50	29.80	0.09
	29-Jul-2005	19.67	19.45	0.22	11.26	2.00	31.80	0.02
	5-Aug-2005	19.70	19.61	0.09	11.11	0.00	31.80	0.09
	12-Aug-2005	19.85	19.72	0.13	11.00	0.15	31.95	0.02
	26-Aug-2005	20.07	19.93	0.14	10.78	0.50	32.45	0.02
	9-Sep-2005	20.15	20.10	0.05	10.62	0.00	32.45	0.05
	24-Sep-2005	20.36	20.28	0.08	10.44	0.00	32.45	0.08
	21-Oct-2005	20.58	20.50	0.08	10.22	0.00	32.45	0.08
	28-Nov-2005	20.05	19.95	0.10	10.77	0.00	32.45	0.10
	3-Jan-2006	21.43	17.81	3.62	12.52	3.50	35.95	0.10
	17-Jan-2006	19.77	14.86	4.91	15.33	3.75	39.70	0.03
	23-Jan-2006	16.68	15.07	1.61	15.48	1.50	41.20	0.06
	31-Jan-2006	15.91	14.95	0.96	15.67	0.70	41.90	0.03
	17-Feb-2006	16.50	15.21	1.29	15.38	2.00	43.90	0.03
	24-Feb-2006	16.09	15.52	0.57	15.15	1.50	45.40	0.05
	3-Mar-2006	15.81	15.45	0.36	15.24	0.25	45.65	0.01
	14-Mar-2006	16.19	15.81	0.38	14.88	0.25	45.90	0.05
	21-Mar-2006	16.30	16.09	0.21	14.62	0.25	46.15	0.06
	31-Mar-2006	16.65	16.30	0.35	14.39	0.40	46.55	0.03
	6-Apr-2006	15.80	15.57	0.23	15.13	0.10	46.65	0.00
	14-Apr-2006	15.96	15.59	0.37	15.10	0.30	46.95	0.05
	24-Apr-2006	16.02	15.50	0.52	15.17	0.75	47.70	0.00
	9-May-2006	16.60	15.95	0.65	14.71	0.70	48.40	0.05
	19-May-2006	16.51	15.89	0.62	14.77	1.10	49.50	0.01
	25-May-2006	16.41	15.84	0.57	14.83	0.80	50.30	0.01
	2-Jun-2006	16.32	15.78	0.54	14.89	0.50	50.80	0.04
	Product Skimmer Installed in Well - June 2006							
	9-Jun-2006	--	--	--	--	0.75	51.55	--
	19-Jun-2006	--	--	--	--	0.25	51.80	--
	28-Jun-2006	--	--	--	--	0.30	52.10	--
	3-Jul-2006	--	--	--	--	0.15	52.25	--
	10-Jul-2006	--	--	--	--	0.10	52.35	--
	18-Jul-2006	--	--	--	--	0.20	52.55	--
	25-Jul-2006	--	--	--	--	0.50	53.05	--
	4-Aug-2006	--	--	--	--	0.50	53.55	--
	11-Aug-2006	--	--	--	--	0.20	53.75	--
	18-Aug-2006	--	--	--	--	0.20	53.95	--
	23-Aug-2006	--	--	--	--	0.10	54.05	--
	8-Sep-2006	--	--	--	--	0.00	54.05	--
	20-Sep-2006	--	--	--	--	0.20	54.25	--
	3-Oct-2006	--	--	--	--	0.05	54.30	--
	6-Nov-2006	--	--	--	--	0.10	54.40	--
	22-Nov-2006	--	--	--	--	0.10	54.50	--
	4-Dec-2006	--	--	--	--	1.90	56.40	--
	13-Dec-2006	--	--	--	--	1.30	57.70	--
	18-Dec-2006	--	--	--	--	1.20	58.90	--
	26-Dec-2006	--	--	--	--	1.20	60.10	--
	5-Jan-2007	--	--	--	--	1.30	61.40	--
	9-Jan-2007	--	--	--	--	1.20	62.60	--
	15-Jan-2007	--	--	--	--	0.00	62.60	--
	26-Jan-2007	--	--	--	--	1.20	63.80	--
	31-Jan-2007	--	--	--	--	1.10	64.90	--
	9-Feb-2007	--	--	--	--	1.00	65.90	--
	13-Feb-2007	--	--	--	--	1.00	66.90	--
	28-Feb-2007	--	--	--	--	1.10	68.00	--
	6-Mar-2007	--	--	--	--	1.00	69.00	--
	23-Mar-2007	--	--	--	--	1.00	70.00	--
	29-Mar-2007	--	--	--	--	4.00	74.00	--
	5-Apr-2007	--	--	--	--	1.00	75.00	--
	11-Apr-2007	--	--	--	--	1.20	76.20	--

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-20 (continued)	5-Apr-2007	--	--	--	--	1.00	77.20	--
	11-Apr-2007	--	--	--	--	1.20	78.40	--
	16-Apr-2007	--	--	--	--	2.70	78.90	--
	25-Apr-2007	--	--	--	--	0.30	79.20	--
	3-May-2007	--	--	--	--	4.10	83.30	--
	10-May-2007	--	--	--	--	0.80	84.10	--
	15-May-2007	--	--	--	--	1.20	85.30	--
	25-May-2007	--	--	--	--	0.50	85.80	--
	4-Jun-2007	--	--	--	--	0.50	86.30	--
	13-Jun-2007	--	--	--	--	0.50	86.80	--
	19-Jun-2007	--	--	--	--	0.00	86.80	--
	27-Jun-2007	--	--	--	--	1.00	87.80	--
	9-Jul-2007	--	--	--	--	0.50	88.30	--
	25-Jul-2007	--	--	--	--	0.10	88.40	--
	9-Aug-2007	--	--	--	--	0.10	88.50	--
	22-Aug-2007	--	--	--	--	0.10	88.60	--
	7-Sep-2007	--	--	--	--	0.10	88.70	--
	14-Sep-2007	--	--	--	--	0.90	89.60	--
	19-Sep-2007	--	--	--	--	0.10	89.70	--
	4-Oct-2007	--	--	--	--	0.10	89.80	--
	11-Oct-2007	--	--	--	--	0.00	89.80	--
	24-Oct-2007	--	--	--	--	0.10	89.90	--
	8-Nov-2007	--	--	--	--	0.10	90.00	--
	21-Nov-2007	--	--	--	--	0.00	90.00	--
	7-Dec-2007	--	--	--	--	0.05	90.05	--
	21-Dec-2007	--	--	--	--	0.05	90.10	--
	3-Jan-2008	19.70	17.44	2.26	--	3.00	93.10	0.02
	18-Jan-2008	18.00	16.93	1.07	--	2.50	95.60	SHEEN
	24-Jan-2008	17.57	16.57	1.00	--	1.00	96.60	SHEEN
	31-Jan-2008	17.61	16.76	0.85	--	1.75	98.35	SHEEN
	6-Feb-2008	18.02	16.55	1.47	--	3.00	101.35	SHEEN
	15-Feb-2008	17.46	15.94	1.52	--	4.25	105.60	SHEEN
	29-Feb-2008	18.18	16.28	1.90	--	2.50	108.10	SHEEN
	14-Mar-2008	17.62	16.59	1.03	--	2.50	110.60	SHEEN
	21-Mar-2008	17.40	17.33	0.07	--	1.00	111.60	SHEEN
	11-Apr-2008	17.80	17.57	0.23	--	2.00	113.60	SHEEN
	17-Apr-2008	17.67	17.56	0.11	--	1.06	114.66	SHEEN
	24-Apr-2008	17.84	17.71	0.13	--	0.26	114.92	SHEEN
	2-May-2008	17.58	17.50	0.08	--	0.25	115.17	0.08
	8-May-2008	17.63	17.59	0.04	--	1.30	116.47	0.04
	14-May-2008	17.92	17.88	0.04	--	0.03	116.50	0.04
	30-May-2008	16.79	16.71	0.08	--	0.03	116.53	0.08
	13-Jun-2008	16.50	16.43	0.07	--	0.26	116.79	SHEEN
	25-Jun-2008	17.05	16.86	0.19	--	0.00	116.79	SHEEN
	11-Jul-2008	17.85	17.76	0.09	--	0.13	116.92	0.09
	28-Jul-2008	18.22	18.21	0.01	--	0.03	116.95	0.01
	13-Aug-2008	19.30	19.28	0.02	--	0.00	116.95	0.02
	27-Aug-2008	19.56	19.55	0.01	--	0.13	117.08	0.01
	8-Sep-2008	19.71	19.68	0.03	--	0.00	117.08	0.03
	18-Sep-2008	19.86	19.84	0.02	--	0.03	117.11	0.02
	30-Sep-2008	20.05	20.02	0.03	--	0.00	117.11	0.03
	16-Oct-2008	20.41	20.40	0.01	--	0.00	117.11	0.01
	30-Oct-2008	20.40	20.39	0.01	--	0.00	117.11	0.01
	14-Nov-2008	20.55	20.54	0.01	--	0.00	117.11	0.01
	26-Nov-2008	20.28	20.23	0.05	--	0.00	117.11	0.05
	16-Dec-2008	20.47	20.46	0.01	--	0.00	117.11	0.01
	29-Dec-2008	20.46	20.44	0.02	--	0.00	117.11	0.02
	15-Jan-2009	18.62	18.07	0.55	--	0.33	117.44	SHEEN
	23-Jan-2009	18.85	17.93	0.92	--	0.40	117.84	0.01
	29-Jan-2009	18.42	18.28	0.14	--	0.26	118.10	SHEEN
	4-Feb-2009	18.31	18.03	0.28	--	0.79	118.89	0.01
	12-Feb-2009	18.53	18.40	0.13	--	0.60	119.49	SHEEN
	19-Feb-2009	18.88	18.81	0.07	--	0.00	119.49	0.07
	10-Mar-2009	19.15	19.12	0.03	--	0.05	119.54	0.03

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-20 (continued)	27-Mar-2009	19.06	19.03	0.03	--	0.05	119.59	0.03
	16-Apr-2009	18.70	18.67	0.03	--	0.00	119.59	0.03
	14-May-2009	18.51	18.48	0.03	--	0.00	119.59	0.03
	5-Jun-2009	17.95	17.94	0.01	--	0.05	119.64	SHEEN
	13-Jul-2009	19.28	19.28	0.00	--	0.00	119.64	SHEEN
	10-Aug-2009	20.10	20.10	0.00	--	0.00	119.64	SHEEN
	9-Sep-2009	20.84	20.82	0.02	--	0.00	119.64	0.02
	15-Oct-2009	20.84	20.80	0.04	--	0.00	119.64	0.04
	18-Nov-2009	20.46	20.46	0.00	--	0.00	119.64	SHEEN
	16-Dec-2009	19.90	19.90	0.00	--	0.00	119.64	0.00
	13-Jan-2010	20.22	18.38	1.84	--	2.50	122.14	SHEEN
	21-Jan-2010	18.67	17.62	1.05	--	2.10	124.24	SHEEN
	26-Jan-2010	18.45	17.80	0.65	--	1.00	125.24	SHEEN
	5-Feb-2010	--	--	--	--	1.00	126.24	SHEEN
	2-Mar-2010	20.57	17.51	3.06	--	2.65	128.89	0.02
	12-Mar-2010	18.70	17.35	1.35	--	2.25	131.14	0.01
	25-Mar-2010	18.56	17.49	1.07	--	2.00	133.14	0.01
	2-Apr-2010	18.15	17.23	0.92	--	2.50	135.64	SHEEN
	9-Apr-2010	18.39	17.43	0.96	--	1.25	136.89	0.01
	16-Apr-2010	18.44	17.39	1.05	--	1.25	138.14	0.03
	23-Apr-2010	18.44	17.60	0.84	--	2.00	140.14	0.01
	4-May-2010	19.58	17.59	1.99	--	2.25	142.39	0.02
	8-Jun-2010	17.65	16.05	1.60	--	1.50	143.89	0.05
	9-Jul-2010	19.73	16.80	2.93	--	3.75	147.64	0.01
	23-Jul-2010	19.05	17.90	1.15	--	1.25	148.89	0.01
	6-Aug-2010	18.66	18.47	0.19	--	1.30	150.19	0.01
	19-Aug-2010	18.96	18.90	0.06	--	0.00	150.19	0.01
	27-Aug-2010	18.91	18.88	0.03	--	0.50	150.69	0.01
	17-Sep-2010	19.44	19.43	0.01	--	0.00	150.69	0.01
	8-Oct-2010	19.66	19.63	0.03	--	0.00	150.69	0.03
	11-Nov-2010	19.96	19.92	0.04	--	0.00	150.69	0.04
	15-Dec-2010	19.93	16.93	3.00	--	5.00	155.69	0.02
	21-Dec-2010	18.68	16.39	2.29	--	2.25	157.94	0.03
	30-Dec-2010	17.84	15.03	2.81	--	3.00	160.94	0.02
	6-Jan-2011	15.81	15.62	0.19	--	2.00	162.94	0.01
	13-Jan-2011	16.30	16.07	0.23	--	1.00	163.94	0.01
	19-Jan-2011	15.76	15.63	0.13	--	0.75	164.69	0.03
	28-Jan-2011	15.55	15.43	0.12	--	0.75	165.44	0.02
	9-Feb-2011	16.92	16.13	0.79	--	2.00	167.44	0.01
	23-Feb-2011	16.30	16.29	0.01	--	0.00	167.44	0.01
	9-Mar-2011	15.82	15.53	0.29	--	0.75	168.19	0.02
	29-Mar-2011	16.25	15.27	0.98	--	1.25	169.44	0.02
	21-Apr-2011	16.11	14.84	1.27	--	1.00	170.44	0.01
	9-Jun-2011	15.15	14.33	0.82	--	0.95	171.39	0.02
	7-Jul-2011	15.27	15.06	0.21	--	0.50	171.89	0.01
	3-Aug-2011	18.35	16.23	2.12	--	2.00	173.89	0.01
	8-Sep-2011	18.76	18.26	0.50	--	0.50	174.39	0.02
	3-Oct-2011	19.09	18.89	0.20	--	0.50	174.89	0.02
	10-Nov-2011	19.53	19.50	0.03	--	0.30	175.19	0.03
	1-Dec-2011	19.19	19.18	0.01	--	0.00	175.19	0.01
	6-Jan-2012	19.15	--	--	--	0.25	175.44	--
	25-Jan-2012	--	--	--	--	0.10	175.54	--
	3-Mar-2012	19.80	18.00	1.80	--	4.00	179.54	0.26
	6-Mar-2012	18.90	17.57	1.33	--	1.50	181.04	SHEEN
	14-Mar-2012	18.62	17.19	1.43	--	2.55	183.59	0.01
	22-Mar-2012	18.67	16.43	2.24	--	1.50	185.09	0.01
	29-Mar-2012	16.25	15.84	0.41	--	2.00	187.09	0.03
	5-Apr-2012	14.35	14.35	0.00	--	0.50	187.59	SHEEN
	13-Apr-2012	14.37	14.33	0.04	--	0.55	188.14	0.04
	13-Apr-2012	16.65	15.26	1.39	--	2.30	190.44	0.02
	14-May-2012	--	--	--	--	0.79	191.23	--
	25-May-2012	16.58	15.32	1.26	--	1.75	192.98	SHEEN
	12-Jun-2012	15.67	15.61	0.06	--	1.25	194.23	SHEEN
	3-Jul-2012	16.40	15.71	0.69	--	0.50	194.73	0.01
	23-Aug-2012	18.65	18.31	0.34	--	0.60	195.33	0.05

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-20 (continued)	24-Sep-2012	19.42	19.25	0.17	--	0.25	195.58	0.02
	8-Oct-2012	19.61	19.50	0.11	--	0.25	195.83	0.02
	14-Nov-2012	19.51	19.48	0.03	--	0.00	195.83	0.03
	20-Dec-2012	17.71	15.62	2.09	--	2.50	198.33	SHEEN
	4-Jan-2013	16.38	15.62	0.76	--	2.30	200.63	0.04
	18-Jan-2013	16.56	16.26	0.30	--	1.25	201.88	0.03
	31-Jan-2013	17.03	17.00	0.03	--	1.00	202.88	0.01
	6-Mar-2013	17.78	17.75	0.03	--	0.10	202.98	0.01
	3-Apr-2013	17.65	17.54	0.11	--	0.90	203.88	--
	6-May-2013	16.54	15.74	0.80	--	1.50	205.38	0.01
	12-Jun-2013	18.11	18.10	0.01	--	1.00	206.38	0.01
	16-Jul-2013	18.81	18.78	0.03	--	0.50	206.88	0.03
	26-Aug-2013	20.12	20.01	0.11	--	0.30	207.18	0.11
	25-Sep-2013	20.15	20.10	0.05	--	0.20	207.38	0.05
	31-Oct-2013	20.14	20.10	0.04	--	0.00	207.38	0.04
	27-Nov-2013	19.95	19.93	0.02	--	0.00	207.38	0.02
	17-Dec-2013	19.90	19.89	0.01	--	0.00	207.38	0.01
	27-Jan-2014	20.35	20.34	0.01	--	0.00	207.38	0.01
	27-Feb-2014	19.30	19.30	0.00	--	0.00	207.38	SHEEN
	26-Mar-2014	18.54	17.01	1.53	--	2.00	209.38	0.01
	15-Apr-2014	18.11	17.42	0.69	--	0.50	209.88	0.01
	9-May-2014	17.25	16.80	0.45	--	1.25	211.13	0.00
	30-Jun-2014	18.20	17.80	0.40	--	0.50	211.63	0.00
	16-Jul-2014	19.00	18.45	0.55	--	2.00	213.63	0.00
	4-Aug-2014	18.95	18.90	0.05	--	0.25	213.88	0.00
	30-Sep-2014	20.40	19.80	0.60	--	0.50	214.38	0.00
	27-Oct-2014	19.40	19.20	0.20	--	0.25	214.63	SHEEN
	24-Nov-2014	19.90	19.70	0.20	--	1.00	215.63	0.00
	11-Dec-2014	18.84	18.83	0.01	--	0.00	215.63	0.00
	29-Jan-2015	18.40	17.80	0.60	--	1.00	216.63	0.10
	27-Feb-2015	20.00	19.75	0.25	--	0.50	217.13	SHEEN
	27-Mar-2015	18.60	17.49	1.11	--	1.50	218.63	0.02
	28-Apr-2015	18.71	18.00	0.71	--	2.00	220.63	0.01
	29-May-2015	19.32	19.02	0.30	--	1.50	222.13	0.01
	23-Jun-2015	19.74	19.44	0.30	--	2.00	224.13	0.01
	8-Jul-2015	19.66	19.58	0.08	--	0.00	224.13	0.08
	12-Aug-2015	20.21	19.98	0.23	--	3.00	227.13	0.02
	11-Sep-2015	20.48	20.30	0.18	--	1.50	228.63	0.01
	15-Oct-2015	20.73	20.61	0.12	--	1.00	229.63	SHEEN
	10-Nov-2015	20.76	20.62	0.14	--	0.75	230.38	SHEEN
	16-Dec-2015	18.25	18.15	0.10	--	1.00	231.38	SHEEN
	21-Jan-2016	15.68	15.64	0.04	--	1.00	232.38	SHEEN
	17-Feb-2016	15.42	15.39	0.03	--	0.00	232.38	SHEEN
	29-Mar-2016	15.70	15.20	0.50	--	0.50	232.88	SHEEN
	27-Apr-2016	16.19	15.71	0.48	--	0.50	233.38	0.03
	27-May-2016	17.40	17.13	0.27	--	0.50	233.88	0.02
	29-Jun-2016	18.95	18.35	0.60	--	1.50	235.38	0.06
	20-Jul-2016	19.32	19.03	0.29	--	0.25	235.63	0.03
	31-Aug-2016	20.10	19.78	0.32	--	0.50	236.13	0.05
	16-Sep-2016	20.39	20.03	0.36	--	0.65	236.78	0.06
	20-Oct-2016	20.05	20.00	0.05	--	0.50	237.28	SHEEN
	28-Nov-2016	18.95	18.91	0.04	--	0.00	237.28	SHEEN
	19-Dec-2016	18.30	17.50	0.80	--	1.50	238.78	SHEEN
HC-6S (32.62)	27-Aug-2003	18.93	NP	0.00	13.69	0.00	0.00	0.00
	3-Sep-2003	19.00	NP	0.00	13.62	0.00	0.00	0.00
	11-Sep-2003	19.11	NP	0.00	13.51	0.00	0.00	0.00
	17-Sep-2003	19.20	NP	0.00	13.42	0.00	0.00	0.00
	30-Sep-2003	19.15	NP	0.00	13.47	0.00	0.00	0.00
	14-Oct-2003	19.19	NP	0.00	13.43	0.00	0.00	0.00
	29-Oct-2003	19.29	NP	0.00	13.33	0.00	0.00	0.00
	13-Nov-2003	19.33	NP	0.00	13.29	0.00	0.00	0.00
	26-Nov-2003	19.13	NP	0.00	13.49	0.00	0.00	0.00
	24-Dec-2003	18.60	NP	0.00	14.02	0.00	0.00	0.00
	21-Jan-2004	17.31	NP	0.00	15.31	0.00	0.00	0.00
	25-Feb-2004	17.81	NP	0.00	14.81	0.00	0.00	0.00
	24-Mar-2004	16.31	NP	0.00	16.31	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-6D (32.48)	27-Aug-2003	21.90	NP	0.00	10.58	0.00	0.00	0.00
	3-Sep-2003	21.99	NP	0.00	10.49	0.00	0.00	0.00
	11-Sep-2003	22.04	NP	0.00	10.44	0.00	0.00	0.00
	17-Sep-2003	22.10	NP	0.00	10.38	0.00	0.00	0.00
	30-Sep-2003	22.06	NP	0.00	10.42	0.00	0.00	0.00
	14-Oct-2003	22.16	NP	0.00	10.32	0.00	0.00	0.00
	29-Oct-2003	22.04	NP	0.00	10.44	0.00	0.00	0.00
	13-Nov-2003	22.10	NP	0.00	10.38	0.00	0.00	0.00
	26-Nov-2003	21.96	NP	0.00	10.52	0.00	0.00	0.00
	24-Dec-2003	21.35	NP	0.00	11.13	0.00	0.00	0.00
	21-Jan-2004	19.88	NP	0.00	12.60	0.00	0.00	0.00
	25-Feb-2004	20.71	NP	0.00	11.77	0.00	0.00	0.00
	24-Mar-2004	17.88	NP	0.00	14.60	0.00	0.00	0.00
HC-10 (29.30)	27-Aug-2003	21.98	17.71	4.27	11.12	2.00	2.00	0.21
	3-Sep-2003	20.06	18.03	2.03	11.05	0.50	2.50	0.04
	11-Sep-2003	19.61	18.46	1.15	10.71	0.10	2.60	0.03
	17-Sep-2003	19.77	18.65	1.12	10.53	0.20	2.80	0.03
	30-Sep-2003	19.69	18.99	0.70	10.23	0.20	3.00	0.01
	14-Oct-2003	19.68	18.85	0.83	10.36	0.30	3.30	0.02
	29-Oct-2003	19.62	18.83	0.79	10.38	0.10	3.40	0.07
	13-Nov-2003	19.60	19.05	0.55	10.19	Trace	3.40	0.01
	19-Nov-2003	19.60	19.15	0.45	10.10	0.10	3.50	0.03
	26-Nov-2003	19.51	19.00	0.51	10.24	0.10	3.60	0.01
	3-Dec-2003	19.27	18.89	0.38	10.37	0.10	3.70	0.01
	10-Dec-2003	19.88	19.60	0.28	9.67	0.10	3.80	0.01
	17-Dec-2003	18.66	18.36	0.30	10.91	0.10	3.90	0.01
	24-Dec-2003	17.98	17.76	0.22	11.52	Trace	3.90	< 0.01
	9-Jan-2004	17.11	16.84	0.27	12.43	0.10	4.00	0.01
	15-Jan-2004	17.00	16.71	0.29	12.56	0.10	4.10	0.01
	21-Jan-2004	16.01	15.85	0.16	13.43	0.10	4.20	0.01
	29-Jan-2004	16.00	15.30	0.70	13.92	0.30	4.50	0.01
	3-Feb-2004	16.10	15.40	0.70	13.82	0.30	4.80	0.01
	12-Feb-2004	15.87	15.28	0.59	13.96	0.10	4.90	0.01
	18-Feb-2004	16.22	15.41	0.81	13.80	0.10	5.00	< 0.01
	25-Feb-2004	15.47	14.86	0.61	14.37	0.10	5.10	< 0.01
	3-Mar-2004	15.95	15.55	0.40	13.71	0.10	5.20	0.01
	10-Mar-2004	16.10	15.65	0.45	13.60	0.05	5.25	0.01
	18-Mar-2004	16.03	15.59	0.44	13.66	0.05	5.30	< 0.01
	24-Mar-2004	16.33	15.99	0.34	13.27	0.05	5.35	< 0.01
	1-Apr-2004	16.50	15.95	0.55	13.29	0.08	5.43	< 0.01
	14-Jan-2005	18.90	18.49	0.41	10.76	0.10	5.53	0.09
	21-Jan-2005	18.60	18.25	0.35	11.01	1.00	6.53	0.10
	28-Jan-2005	18.48	18.22	0.26	11.05	0.15	6.68	0.09
	4-Feb-2005	18.49	18.27	0.22	11.01	0.20	6.88	0.03
	11-Feb-2005	18.30	18.12	0.18	11.16	0.05	6.93	0.06
	18-Feb-2005	18.26	18.11	0.15	11.17	0.10	7.03	0.06
	25-Feb-2005	18.50	18.37	0.13	10.92	0.05	7.08	0.06
	4-Mar-2005	18.64	18.52	0.12	10.77	0.05	7.13	0.02
	11-Mar-2005	18.58	18.48	0.10	10.81	0.15	7.28	0.01
	18-Mar-2005	18.56	18.47	0.09	10.82	0.00	7.28	0.09
	25-Mar-2005	18.86	18.75	0.11	10.54	0.05	7.33	0.01
	1-Apr-2005	18.52	18.46	0.06	10.83	0.00	7.33	0.06
	14-Apr-2005	18.44	18.43	0.01	10.87	0.10	7.43	0.01
	30-Apr-2005	18.22	18.14	0.08	11.15	0.00	7.43	0.08
	13-May-2005	18.88	18.82	0.06	10.47	0.00	7.43	0.06
	31-May-2005	17.38	17.32	0.06	11.97	0.00	7.43	0.06
	24-Jun-2005	17.55	17.50	0.05	11.79	0.00	7.43	0.05
	29-Jul-2005	18.16	18.09	0.07	11.20	0.00	7.43	0.07
	26-Aug-2005	18.60	18.52	0.08	10.77	0.00	7.43	0.08
	24-Sep-2005	19.05	18.90	0.15	10.38	0.05	7.48	0.00
	10-Oct-2005	19.25	19.05	0.20	10.23	0.50	7.98	0.04
	21-Oct-2005	19.25	19.19	0.06	10.10	0.00	7.98	0.06

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-10 (continued)	28-Nov-2005	18.70	18.65	0.05	10.64	0.00	7.98	0.05
	3-Jan-2006	17.35	17.30	0.05	11.99	0.00	7.98	0.05
	17-Feb-2006	15.33	14.79	0.54	14.45	1.00	8.98	0.08
	3-Mar-2006	15.43	14.89	0.54	14.35	0.25	9.23	0.06
	13-Mar-2006	15.54	15.15	0.39	14.11	0.00	0.00	0.39
	27-Jun-2006	15.58	15.41	0.17	13.87	0.10	9.33	0.01
	19-Sep-2006	19.18	18.34	0.84	10.87	0.35	9.68	0.02
	13-Dec-2006	17.16	16.63	0.53	12.61	0.25	9.93	0.02
	29-Mar-2007	15.91	15.33	0.58	13.91	0.25	10.18	0.08
	27-Jun-2007	17.50	17.03	0.47	12.22	2.00	12.18	0.07
	19-Sep-2007	19.09	18.70	0.39	10.56	0.25	12.43	0.01
	6-Dec-2007	18.76	18.49	0.27	10.78	0.40	12.83	0.00
	10-Mar-2008	16.16	15.82	0.34	13.44	0.00	12.83	0.08
	12-Mar-2008	16.28	15.82	0.46	13.43	0.50	13.33	SHEEN
	13-Jun-2008	15.23	15.10	0.13	14.19	0.26	13.59	SHEEN
	9-Sep-2008	18.46	18.40	0.06	10.89	0.79	14.38	SHEEN
	29-Dec-2008	19.03	18.81	0.22	10.47	0.33	14.71	0.01
	10-Mar-2009	17.34	17.32	0.02	11.98	0.00	14.71	0.02
	4-Jun-2009	16.75	16.54	0.21	12.74	0.08	14.79	0.01
	9-Sep-2009	19.01	18.83	0.18	10.45	0.07	14.86	SHEEN
	15-Dec-2009	18.32	18.23	0.09	11.06	0.00	14.86	0.09
	12-Mar-2010	16.62	16.21	0.41	13.04	0.25	15.11	0.00
	25-Mar-2010	16.35	16.30	0.05	12.99	0.00	15.11	0.05
	16-Apr-2010	16.50	16.09	0.41	13.16	0.25	15.36	0.01
	23-Apr-2010	16.77	16.48	0.29	12.79	0.13	15.49	0.00
	4-May-2010	16.71	16.63	0.08	12.66	0.00	15.49	0.08
	8-Jun-2010	15.53	15.27	0.26	14.00	0.25	15.74	SHEEN
	9-Jul-2010	--	--	--	--	--	--	--
	23-Jul-2010	--	--	--	--	--	--	--
	6-Aug-2010	17.34	16.95	0.39	12.31	0.25	15.99	0.02
	19-Aug-2010	17.59	17.30	0.29	11.97	0.25	16.24	SHEEN
	27-Aug-2010	17.71	17.49	0.22	11.79	0.25	16.49	0.01
	17-Sep-2010	18.01	17.82	0.19	11.46	0.25	16.74	0.02
	8-Oct-2010	18.36	18.18	0.18	11.10	0.10	16.84	0.01
	11-Nov-2010	18.15	18.02	0.13	11.27	0.10	16.94	SHEEN
	15-Dec-2010	16.32	16.15	0.17	13.13	0.10	17.04	0.01
	21-Dec-2010	15.88	15.72	0.16	13.56	0.20	17.24	0.01
	30-Dec-2010	-	--	--	--	--	--	--
	6-Jan-2011	15.22	15.08	0.14	14.20	0.25	17.49	0.02
	13-Jan-2011	15.34	15.31	0.03	13.99	0.00	17.49	0.03
	19-Jan-2011	15.09	14.76	0.33	14.50	0.25	17.74	SHEEN
	28-Jan-2011	14.41	14.12	0.29	15.15	0.25	17.99	SHEEN
	9-Feb-2011	15.35	15.19	0.16	14.09	0.25	18.24	SHEEN
	23-Feb-2011	15.31	15.11	0.20	14.17	0.10	18.34	0.03
	9-Mar-2011	15.49	15.31	0.18	13.97	0.25	18.59	0.02
	29-Mar-2011	14.98	14.64	0.34	14.62	0.25	18.84	SHEEN
	21-Apr-2011	14.42	14.08	0.34	15.18	0.30	19.14	SHEEN
	6-May-2011	14.57	14.23	0.34	15.03	0.15	19.29	SHEEN
	9-Jun-2011	13.42	13.12	0.30	16.15	0.20	19.49	SHEEN
	7-Jul-2011	13.43	12.84	0.59	16.40	0.25	19.74	0.01
	3-Aug-2011	15.69	15.45	0.24	13.82	0.20	19.94	SHEEN
	8-Sep-2011	17.25	17.04	0.21	12.24	0.25	20.19	0.01
	3-Oct-2011	17.67	17.54	0.13	11.75	0.20	20.39	0.01
	10-Nov-2011	18.26	18.13	0.13	11.16	0.10	20.49	0.1
	1-Dec-2011	17.96	17.88	0.08	11.41	0.00	20.49	0.08
	6-Jan-2012	17.72	17.63	0.09	11.66	0.00	20.49	0.09
	25-Jan-2012	17.16	17.06	0.10	12.23	0.00	20.49	0.10
	3-Mar-2012	17.11	16.93	0.18	12.35	0.20	20.69	0.01
	14-Mar-2012	16.35	16.22	0.13	13.07	0.15	20.84	SHEEN
	22-Mar-2012	15.80	15.67	0.13	13.62	0.12	20.96	SHEEN
	29-Mar-2012	15.07	14.99	0.08	14.30	0.00	20.96	0.08
	5-Apr-2012	14.46	14.36	0.10	14.93	0.13	21.08	SHEEN
	13-Apr-2012	14.41	14.41	0.00	14.89	0.00	21.08	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-10 (continued)	23-Apr-2012	14.58	14.38	0.20	14.90	0.25	21.33	SHEEN
	14-May-2012	14.31	14.16	0.15	15.12	0.20	21.53	0.00
	25-May-2012	14.36	14.33	0.03	14.97	0.00	21.53	0.03
	12-Jun-2012	14.81	14.61	0.20	14.67	0.10	21.63	0.01
	3-Jul-2012	15.10	14.75	0.35	14.51	0.13	21.76	0.01
	23-Aug-2012	17.08	17.02	0.06	12.27	0.00	21.76	0.06
	24-Sep-2012	18.01	17.77	0.24	11.50	0.13	21.88	SHEEN
	8-Oct-2012	18.23	18.15	0.08	11.14	0.00	21.88	0.08
	14-Nov-2012	18.00	17.99	0.01	11.31	0.00	21.88	0.01
	20-Dec-2012	15.36	15.11	0.25	14.16	0.10	21.98	0.01
	4-Jan-2013	15.44	15.08	0.36	14.18	0.10	22.08	0.01
	18-Jan-2013	15.53	15.24	0.29	14.03	0.25	22.33	SHEEN
	31-Jan-2013	16.14	15.87	0.27	13.40	0.05	22.38	0.01
	6-Mar-2013	16.53	16.33	0.20	12.95	0.10	22.48	0.01
	3-Apr-2013	17.27	17.10	0.17	12.18	0.20	22.68	0.01
	6-May-2013	17.11	16.90	0.21	12.38	0.50	23.18	SHEEN
	12-Jun-2013	17.12	17.00	0.12	12.29	0.15	23.33	SHEEN
	16-Jul-2013	17.50	17.38	0.12	11.91	0.10	23.43	0.01
	26-Aug-2013	18.45	18.40	0.05	10.89	0.10	23.53	0.01
	25-Sep-2013	20.09	20.08	0.01	9.22	0.00	23.43	0.01
	31-Oct-2013	18.68	18.61	0.07	10.68	0.10	23.43	0.07
	27-Nov-2013	18.56	18.45	0.11	10.84	0.10	23.53	0.01
	17-Dec-2013	18.53	18.46	0.07	10.83	0.00	23.53	0.01
	12-Dec-2014	17.48	17.31	0.17	11.97	0.20	23.73	SHEEN
	29-Jan-2015	17.70	17.50	0.20	11.78	0.50	24.23	SHEEN
	27-Feb-2015	17.60	17.40	0.20	11.88	0.40	24.63	SHEEN
	27-Mar-2015	15.60	15.58	0.02	13.72	0.00	24.63	0.02
	28-Apr-2015	15.64	15.61	0.03	13.69	0.00	24.63	0.03
	29-May-2015	17.53	17.48	0.05	11.81	0.00	24.63	0.05
	23-Jun-2015	18.06	17.97	0.09	11.32	0.00	24.63	0.09
	8-Jul-2015	18.20	18.11	0.09	11.18	0.00	24.63	0.09
	12-Aug-2015	18.70	18.62	0.08	10.67	0.00	24.63	0.08
	11-Sep-2015	19.16	18.86	0.30	10.41	1.00	25.63	SHEEN
	15-Oct-2015	19.68	19.20	0.48	10.05	1.00	26.63	0.01
	10-Nov-2015	19.80	19.30	0.50	9.95	1.00	27.63	0.01
	16-Dec-2015	17.20	17.00	0.20	12.28	1.25	28.88	SHEEN
	21-Jan-2016	15.00	14.80	0.20	14.48	0.25	29.13	0.02
	17-Feb-2016	14.41	14.25	0.16	15.03	0.25	29.38	0.01
	29-Mar-2016	14.80	14.18	0.62	15.05	0.70	30.08	SHEEN
	27-Apr-2016	15.24	14.70	0.54	14.54	0.50	30.58	0.04
	27-May-2016	16.68	16.10	0.58	13.14	0.50	31.08	0.01
	29-Jun-2016	17.51	17.00	0.51	12.24	0.75	31.83	0.05
	20-Jul-2016	18.10	17.58	0.52	11.66	0.50	32.33	0.03
	31-Aug-2016	18.81	18.31	0.50	10.94	0.50	32.83	0.01
	16-Sep-2016	18.85	18.62	0.23	10.65	0.50	33.33	0.01
	20-Oct-2016	19.00	18.65	0.35	10.61	0.50	33.83	SHEEN
	28-Nov-2016	17.91	17.61	0.30	11.66	0.10	33.93	SHEEN
	19-Dec-2016	16.78	16.50	0.28	12.77	0.50	34.43	SHEEN
HC-12S (29.19)	27-Aug-2003	14.14	NP	0.00	15.05	0.00	0.00	0.00
	3-Sep-2003	14.20	NP	0.00	14.99	0.00	0.00	0.00
	11-Sep-2003	14.34	NP	0.00	14.85	0.00	0.00	0.00
	17-Sep-2003	14.44	NP	0.00	14.75	0.00	0.00	0.00
	30-Sep-2003	14.39	NP	0.00	14.80	0.00	0.00	0.00
	14-Oct-2003	14.44	NP	0.00	14.75	0.00	0.00	0.00
	29-Oct-2003	14.60	NP	0.00	14.59	0.00	0.00	0.00
	13-Nov-2003	14.63	NP	0.00	14.56	0.00	0.00	0.00
	26-Nov-2003	14.50	NP	0.00	14.69	0.00	0.00	0.00
	24-Dec-2003	14.01	NP	0.00	15.18	0.00	0.00	0.00
	21-Jan-2004	12.75	NP	0.00	16.44	0.00	0.00	0.00
	25-Feb-2004	13.56	NP	0.00	15.63	0.00	0.00	0.00
	24-Mar-2004	12.97	NP	0.00	16.22	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-12D (28.91)	27-Aug-2003	18.26	NP	0.00	10.65	0.00	0.00	0.00
	3-Sep-2003	18.34	NP	0.00	10.57	0.00	0.00	0.00
	11-Sep-2003	18.65	NP	0.00	10.26	0.00	0.00	0.00
	17-Sep-2003	18.71	NP	0.00	10.20	0.00	0.00	0.00
	30-Sep-2003	18.60	NP	0.00	10.31	0.00	0.00	0.00
	14-Oct-2003	18.69	NP	0.00	10.22	0.00	0.00	0.00
	29-Oct-2003	19.01	NP	0.00	9.90	0.00	0.00	0.00
	13-Nov-2003	19.16	NP	0.00	9.75	0.00	0.00	0.00
	26-Nov-2003	18.98	NP	0.00	9.93	0.00	0.00	0.00
	24-Dec-2003	17.89	NP	0.00	11.02	0.00	0.00	0.00
	21-Jan-2004	17.63	NP	0.00	11.28	0.00	0.00	0.00
	25-Feb-2004	15.03	NP	0.00	13.88	0.00	0.00	0.00
	24-Mar-2004	17.17	NP	0.00	11.74	0.00	0.00	0.00
	11-Dec-2014	17.34	NP	0.00	11.57	0.00	0.00	0.00
	15-Dec-2015	17.36	NP	0.00	11.55	0.00	0.00	0.00
	19-Dec-2016	16.50	NP	0.00	12.41	0.00	0.00	0.00
HC-15 (33.16)	27-Aug-2003	15.59	NP	0.00	17.57	0.00	0.00	0.00
	3-Sep-2003	15.68	NP	0.00	17.48	0.00	0.00	0.00
	11-Sep-2003	15.85	NP	0.00	17.31	0.00	0.00	0.00
	17-Sep-2003	15.98	NP	0.00	17.18	0.00	0.00	0.00
	30-Sep-2003	16.03	NP	0.00	17.13	0.00	0.00	0.00
	14-Oct-2003	16.07	NP	0.00	17.09	0.00	0.00	0.00
	29-Oct-2003	16.11	NP	0.00	17.05	0.00	0.00	0.00
	13-Nov-2003	16.19	NP	0.00	16.97	0.00	0.00	0.00
	26-Nov-2003	16.03	NP	0.00	17.13	0.00	0.00	0.00
	24-Dec-2003	15.36	NP	0.00	17.80	0.00	0.00	0.00
	21-Jan-2004	14.76	NP	0.00	18.40	0.00	0.00	0.00
	25-Feb-2004	14.35	NP	0.00	18.81	0.00	0.00	0.00
	24-Mar-2004	14.66	NP	0.00	18.50	0.00	0.00	0.00
	(33.16) 14-Jan-2005	--	--	--	--	--	--	--
	21-Jan-2005	15.45	NP	0.00	17.71	0.00	0.00	0.00
	28-Jan-2005	15.44	15.43	0.01	17.73	0.00	0.00	0.01
	25-Feb-2005	15.45	15.45	0.00	17.71	0.00	0.00	0.00
	25-Mar-2005	15.61	15.61	0.00	17.55	0.00	0.00	0.00
	30-Apr-2005	15.25	NP	0.00	17.91	0.00	0.00	0.00
	13-May-2005	15.32	NP	0.00	17.84	0.00	0.00	0.00
	31-May-2005	Abandoned						
HC-16 (32.83)	27-Aug-2003	15.75	NP	0.00	17.08	0.00	0.00	0.00
	3-Sep-2003	15.83	NP	0.00	17.00	0.00	0.00	0.00
	11-Sep-2003	16.00	NP	0.00	16.83	0.00	0.00	0.00
	17-Sep-2003	16.16	NP	0.00	16.67	0.00	0.00	0.00
	30-Sep-2003	16.15	NP	0.00	16.68	0.00	0.00	0.00
	14-Oct-2003	16.18	NP	0.00	16.65	0.00	0.00	0.00
	29-Oct-2003	16.28	NP	0.00	16.55	0.00	0.00	0.00
	13-Nov-2003	16.28	NP	0.00	16.55	0.00	0.00	0.00
	26-Nov-2003	16.15	NP	0.00	16.68	0.00	0.00	0.00
	24-Dec-2003	15.49	NP	0.00	17.34	0.00	0.00	0.00
	21-Jan-2004	15.88	NP	0.00	16.95	0.00	0.00	0.00
	25-Feb-2004	14.45	NP	0.00	18.38	0.00	0.00	0.00
	24-Mar-2004	14.76	NP	0.00	18.07	0.00	0.00	0.00
	14-Jan-2005	15.71	NP	0.00	17.12	0.00	0.00	0.00
	28-Jan-2005	15.67	15.65	0.02	17.18	0.00	0.00	0.02
	25-Feb-2005	15.66	15.65	0.01	17.18	0.00	0.00	0.01
	25-Mar-2005	15.81	15.80	0.01	17.03	0.00	0.00	0.01
	30-Apr-2005	15.58	NP	0.00	17.25	0.00	0.00	0.00
	31-May-2005	15.35	NP	0.00	17.48	0.00	0.00	0.00
	24-Jun-2005	15.36	NP	0.00	17.47	0.00	0.00	0.00
	29-Jul-2005	15.52	NP	0.00	17.31	0.00	0.00	0.00
	26-Aug-2005	15.70	NP	0.00	17.13	0.00	0.00	0.00
	24-Sep-2005	15.85	NP	0.00	16.98	0.00	0.00	0.00
	21-Oct-2005	15.95	NP	0.00	16.88	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-16 (continued)	28-Nov-2005	15.63	NP	0.00	17.20	0.00	0.00	0.00
	3-Jan-2006	15.14	NP	0.00	17.69	0.00	0.00	0.00
	17-Feb-2006	14.20	NP	0.00	18.63	0.00	0.00	0.00
	13-Mar-2006	14.40	NP	0.00	18.43	0.00	0.00	0.00
	27-Jun-2006	14.98	NP	0.00	17.85	0.00	0.00	0.00
	19-Sep-2006	15.62	NP	0.00	17.21	0.00	0.00	0.00
	13-Dec-2006	15.04	NP	0.00	17.79	0.00	0.00	0.00
	29-Mar-2007	14.66	NP	0.00	18.17	0.00	0.00	0.00
	27-Jun-2007	15.31	NP	0.00	17.52	0.00	0.00	0.00
	18-Sep-2007	15.95	NP	0.00	16.88	0.00	0.00	0.00
	6-Dec-2007	15.81	NP	0.00	17.02	0.00	0.00	0.00
	10-Mar-2008	14.84	NP	0.00	17.99	0.00	0.00	0.00
	12-Jun-2008	15.10	NP	0.00	17.73	0.00	0.00	0.00
	8-Sep-2008	15.87	NP	0.00	16.96	0.00	0.00	0.00
	29-Dec-2008	15.85	NP	0.00	16.98	0.00	0.00	0.00
	10-Mar-2009	15.44	NP	0.00	17.39	0.00	0.00	0.00
	4-Jun-2009	15.47	NP	0.00	17.36	0.00	0.00	0.00
HC-17R (33.61)	13-Nov-2003	16.94	NP	0.00	16.67	0.00	0.00	0.00
	26-Nov-2003	16.41	NP	0.00	17.20	0.00	0.00	0.00
	24-Dec-2003	16.41	NP	0.00	17.20	0.00	0.00	0.00
	9-Jan-2004	16.05	16.02	0.03	13.28	0.00	0.00	0.03
	21-Jan-2004	15.82	15.79	0.03	13.51	0.00	0.00	0.03
	3-Feb-2004	15.90	15.88	0.02	13.42	0.00	0.00	0.02
	18-Feb-2004	15.71	15.55	0.16	13.73	0.03	0.03	< 0.01
	25-Feb-2004	15.58	15.48	0.10	13.81	0.02	0.05	< 0.01
	10-Mar-2004	15.69	15.60	0.09	13.69	0.00	0.05	0.09
	24-Mar-2004	16.87	16.78	0.09	12.51	0.00	0.05	0.09
	14-Jan-2005	17.60	NP	0.00	16.01	NP	NP	0.00
	28-Jan-2005	17.47	17.47	SHEEN	16.14	0.00	0.05	0.00
	25-Feb-2005	17.52	17.52	0.00	16.09	0.00	0.05	0.00
	25-Mar-2005	17.65	17.63	0.02	15.98	0.00	0.05	0.02
	30-Apr-2005	17.35	NP	0.00	16.26	0.00	0.05	0.00
	31-May-2005	17.15	NP	0.00	16.46	0.00	0.05	0.00
	24-Jun-2005	17.14	NP	0.00	16.47	0.00	0.05	0.00
	29-Jul-2005	17.33	NP	0.00	16.28	0.00	0.05	0.00
	26-Aug-2005	17.46	NP	0.00	16.15	0.00	0.05	0.00
	24-Sep-2005	17.55	NP	0.00	16.06	0.00	0.05	0.00
	21-Oct-2005	17.62	NP	0.00	15.99	0.00	0.05	0.00
	28-Nov-2005	17.30	NP	0.00	16.31	0.00	0.05	0.00
	3-Jan-2006	16.73	NP	0.00	16.88	0.00	0.05	0.00
	17-Feb-2006	16.20	NP	0.00	17.41	0.00	0.05	0.00
	13-Mar-2006	16.36	NP	0.00	17.25	0.00	0.05	0.00
	27-Jun-2006	16.82	NP	0.00	16.79	0.00	0.05	0.00
	19-Sep-2006	17.47	NP	0.00	16.14	0.00	0.05	0.00
	13-Dec-2006	16.93	NP	0.00	16.68	0.00	0.05	0.00
	29-Mar-2007	16.70	NP	0.00	16.91	0.00	0.05	0.00
	27-Jun-2007	17.29	NP	0.00	16.32	0.00	0.05	0.00
	18-Sep-2007	17.89	NP	0.00	15.72	0.00	0.05	0.00
	6-Dec-2007	17.24	NP	0.00	16.37	0.00	0.05	0.00
	10-Mar-2008	16.85	NP	0.00	16.76	0.00	0.05	0.00
	12-Jun-2008	16.88	NP	0.00	16.73	0.00	0.05	0.00
	8-Sep-2008	17.85	NP	0.00	15.76	0.00	0.05	0.00
	29-Dec-2008	17.89	NP	0.00	15.72	0.00	0.05	0.00
	10-Mar-2009	17.61	NP	0.00	16.00	0.00	0.05	0.00
	4-Jun-2009	17.54	NP	0.00	16.07	0.00	0.05	0.00
HC-18 (33.29)	13-Nov-2003	16.37	NP	0.00	16.92	0.00	0.00	0.00
	26-Nov-2003	15.83	NP	0.00	17.46	0.00	0.00	0.00
	24-Dec-2003	15.38	NP	0.00	17.91	0.00	0.00	0.00
	21-Jan-2004	14.73	NP	0.00	18.56	0.00	0.00	0.00
	25-Feb-2004	14.37	NP	0.00	18.92	0.00	0.00	0.00
	24-Mar-2004	14.68	NP	0.00	18.61	0.00	0.00	0.00
	14-Jan-2005	15.71	NP	0.00	17.58	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-18 (continued)	28-Jan-2005	15.60	NP	0.00	17.69	0.00	0.00	0.00
	25-Feb-2005	15.65	15.65	0.00	17.64	0.00	0.00	0.00
	25-Mar-2005	15.81	15.81	0.00	17.48	0.00	0.00	0.00
	30-Apr-2005	16.50	NP	0.00	16.79	0.00	0.00	0.00
	31-May-2005	15.34	NP	0.00	17.95	0.00	0.00	0.00
	24-Jun-2005	15.35	NP	0.00	17.94	0.00	0.00	0.00
	29-Jul-2005	15.52	NP	0.00	17.77	0.00	0.00	0.00
	26-Aug-2005	15.67	NP	0.00	17.62	0.00	0.00	0.00
	24-Sep-2005	15.83	NP	0.00	17.46	0.00	0.00	0.00
	21-Oct-2005	15.95	NP	0.00	17.34	0.00	0.00	0.00
	28-Nov-2005	15.63	NP	0.00	17.66	0.00	0.00	0.00
	3-Jan-2006	15.06	NP	0.00	18.23	0.00	0.00	0.00
	17-Feb-2006	14.13	NP	0.00	19.16	0.00	0.00	0.00
	13-Mar-2006	14.35	NP	0.00	18.94	0.00	0.00	0.00
	27-Jun-2006	15.97	NP	0.00	17.32	0.00	0.00	0.00
	19-Sep-2006	15.65	NP	0.00	17.64	0.00	0.00	0.00
	13-Dec-2006	15.09	NP	0.00	18.20	0.00	0.00	0.00
	29-Mar-2007	14.65	NP	0.00	18.64	0.00	0.00	0.00
	27-Jun-2007	15.35	NP	0.00	17.94	0.00	0.00	0.00
	18-Sep-2007	15.99	NP	0.00	17.30	0.00	0.00	0.00
	6-Dec-2007	15.89	NP	0.00	17.40	0.00	0.00	0.00
	10-Mar-2008	14.79	NP	0.00	18.50	0.00	0.00	0.00
	12-Jun-2008	15.12	NP	0.00	18.17	0.00	0.00	0.00
	8-Sep-2008	15.96	NP	0.00	17.33	0.00	0.00	0.00
	29-Dec-2008	16.43	NP	0.00	16.86	0.00	0.00	0.00
	10-Mar-2009	15.45	NP	0.00	17.84	0.00	0.00	0.00
	4-Jun-2009	15.51	NP	0.00	17.78	0.00	0.00	0.00
HC-19 (33.05)	13-Nov-2003	17.92	NP	0.00	15.13	0.00	0.00	0.00
	26-Nov-2003	17.79	NP	0.00	15.26	0.00	0.00	0.00
	24-Dec-2003	16.85	NP	0.00	16.20	0.00	0.00	0.00
	21-Jan-2004	16.29	NP	0.00	16.76	0.00	0.00	0.00
	25-Feb-2004	18.11	NP	0.00	14.94	0.00	0.00	0.00
	24-Mar-2004	16.41	NP	0.00	16.64	0.00	0.00	0.00
	14-Jan-2005	17.40	NP	0.00	15.65	0.00	0.00	0.00
	28-Jan-2005	17.29	17.29	SHEEN	15.76	0.00	0.00	0.00
	25-Feb-2005	17.29	17.29	0.00	15.76	0.00	0.00	0.00
	25-Mar-2005	17.45	17.45	0.00	15.60	0.00	0.00	0.00
	30-Apr-2005	17.14	NP	0.00	15.91	0.00	0.00	0.00
	31-May-2005	15.90	NP	0.00	17.15	0.00	0.00	0.00
	24-Jun-2005	16.95	NP	0.00	16.10	0.00	0.00	0.00
	29-Jul-2005	17.11	NP	0.00	15.94	0.00	0.00	0.00
	26-Aug-2005	17.28	NP	0.00	15.77	0.00	0.00	0.00
	24-Sep-2005	17.40	NP	0.00	15.65	0.00	0.00	0.00
	21-Oct-2005	17.43	NP	0.00	15.62	0.00	0.00	0.00
	28-Nov-2005	17.09	NP	0.00	15.96	0.00	0.00	0.00
	3-Jan-2006	16.30	NP	0.00	16.75	0.00	0.00	0.00
	17-Feb-2006	15.96	NP	0.00	17.09	0.00	0.00	0.00
	13-Mar-2006	16.13	NP	0.00	16.92	0.00	0.00	0.00
	27-Jun-2006	16.60	NP	0.00	16.45	0.00	0.00	0.00
	19-Sep-2006	17.26	NP	0.00	15.79	0.00	0.00	0.00
	13-Dec-2006	16.67	NP	0.00	16.38	0.00	0.00	0.00
	29-Mar-2007	16.36	NP	0.00	16.69	0.00	0.00	0.00
	27-Jun-2007	17.04	NP	0.00	16.01	0.00	0.00	0.00
	18-Sep-2007	17.63	NP	0.00	15.42	0.00	0.00	0.00
	6-Dec-2007	16.59	NP	0.00	16.46	0.00	0.00	0.00
	10-Mar-2008	16.48	NP	0.00	16.57	0.00	0.00	0.00
	12-Jun-2008	16.01	NP	0.00	17.04	0.00	0.00	0.00
	8-Sep-2008	17.64	NP	0.00	15.41	0.00	0.00	0.00
	29-Dec-2008	17.55	NP	0.00	15.50	0.00	0.00	0.00
	10-Mar-2009	17.34	NP	0.00	15.71	0.00	0.00	0.00
	4-Jun-2009	17.27	NP	0.00	15.78	0.00	0.00	0.00
	9-Sep-2009	18.03	NP	0.00	15.02	0.00	0.00	0.00
	15-Dec-2009	17.52	NP	0.00	15.53	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-19 (continued)	11-Mar-2010	16.75	NP	0.00	16.30	0.00	0.00	0.00
	8-Jun-2010	16.50	NP	0.00	16.55	0.00	0.00	0.00
	16-Sep-2010	17.26	NP	0.00	15.79	0.00	0.00	0.00
	13-Dec-2010	16.26	NP	0.00	16.79	0.00	0.00	0.00
	9-Jun-2011	15.12	NP	0.00	17.93	0.00	0.00	0.00
	1-Dec-2011	17.03	NP	0.00	16.02	0.00	0.00	0.00
	11-Jun-2012	16.30	NP	0.00	16.75	0.00	0.00	0.00
	19-Dec-2012	16.13	NP	0.00	16.92	0.00	0.00	0.00
	17-Dec-2013	17.84	NP	0.00	15.21	0.00	0.00	0.00
	11-Dec-2014	17.28	NP	0.00	15.77	0.00	0.00	0.00
	15-Dec-2015	16.08	NP	0.00	16.97	0.00	0.00	0.00
	19-Dec-2016	16.86	NP	0.00	16.19	0.00	0.00	0.00
HC-20 (32.26)	13-Nov-2003	16.18	NP	0.00	16.08	0.00	0.00	0.00
	26-Nov-2003	15.99	NP	0.00	16.27	0.00	0.00	0.00
	24-Dec-2003	15.36	NP	0.00	16.90	0.00	0.00	0.00
	21-Jan-2004	14.78	NP	0.00	17.48	0.00	0.00	0.00
	25-Feb-2004	14.50	14.46	0.04	17.80	0.00	0.00	0.04
	10-Mar-2004	14.70	14.65	0.05	17.60	0.00	0.00	0.05
	24-Mar-2004	14.85	14.81	0.04	17.45	0.00	0.00	0.04
	14-Jan-2005	--	--	--	--	--	--	--
	21-Jan-2005	17.40	NP	0.00	14.86	0.00	0.00	0.00
	28-Jan-2005	15.40	NP	0.00	16.86	0.00	0.00	0.00
	25-Feb-2005	15.36	NP	0.00	16.90	0.00	0.00	0.00
	25-Mar-2005	15.56	15.56	0.00	16.70	0.00	0.00	0.00
	30-Apr-2005	15.31	NP	0.00	16.95	0.00	0.00	0.00
	31-May-2005	15.17	NP	0.00	17.09	0.00	0.00	0.00
	24-Jun-2005	15.17	NP	0.00	17.09	0.00	0.00	0.00
	29-Jul-2005	15.33	NP	0.00	16.93	0.00	0.00	0.00
	26-Aug-2005	15.49	NP	0.00	16.77	0.00	0.00	0.00
	24-Sep-2005	16.69	NP	0.00	15.57	0.00	0.00	0.00
	21-Oct-2005	15.70	NP	0.00	16.56	0.00	0.00	0.00
	28-Nov-2005	15.32	NP	0.00	16.94	0.00	0.00	0.00
	3-Jan-2006	14.82	NP	0.00	17.44	0.00	0.00	0.00
	17-Feb-2006	14.16	NP	0.00	18.10	0.00	0.00	0.00
	13-Mar-2006	14.30	NP	0.00	17.96	0.00	0.00	0.00
	19-Sep-2006	15.58	NP	0.00	16.68	0.00	0.00	0.00
	13-Dec-2006	14.78	NP	0.00	17.48	0.00	0.00	0.00
	29-Mar-2007	14.50	NP	0.00	17.76	0.00	0.00	0.00
	27-Jun-2007	15.15	NP	0.00	17.11	0.00	0.00	0.00
	18-Sep-2007	15.70	NP	0.00	16.56	0.00	0.00	0.00
	6-Dec-2007	15.09	NP	0.00	17.17	0.00	0.00	0.00
	10-Mar-2008	14.71	NP	0.00	17.55	0.00	0.00	0.00
	12-Jun-2008	14.83	NP	0.00	17.43	0.00	0.00	0.00
	8-Sep-2008	15.63	NP	0.00	16.63	0.00	0.00	0.00
	29-Dec-2008	Well inadvertently not gauged during groundwater monitoring event.						
	10-Mar-2009	15.70	NP	0.00	16.56	0.00	0.00	0.00
	4-Jun-2009	15.25	NP	0.00	17.01	0.00	0.00	0.00
HC-21 (31.95)	13-Nov-2003	17.60	NP	0.00	14.35	0.00	0.00	0.00
	26-Nov-2003	17.41	NP	0.00	14.54	0.00	0.00	0.00
	24-Dec-2003	16.22	NP	0.00	16.04	0.00	0.00	0.00
	21-Jan-2004	15.53	NP	0.00	16.73	0.00	0.00	0.00
	25-Feb-2004	15.32	NP	0.00	16.94	0.00	0.00	0.00
	24-Mar-2004	14.60	NP	0.00	17.66	0.00	0.00	0.00
	14-Jan-2005	16.36	NP	0.00	15.59	0.00	0.00	0.00
	28-Jan-2005	16.53	16.52	0.01	15.43	0.00	0.00	0.00
	25-Feb-2005	16.57	16.57	0.00	15.38	0.00	0.00	0.00
	25-Mar-2005	16.78	16.78	0.00	15.17	0.00	0.00	0.00
	30-Apr-2005	16.44	NP	0.00	15.51	0.00	0.00	0.00
	31-May-2005	16.18	NP	0.00	15.77	0.00	0.00	0.00
	24-Jun-2005	16.29	NP	0.00	15.66	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

[illegible]

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-22 (continued)	10-Mar-2008	13.68	NP	0.00	18.23	0.00	0.00	0.00
	8-Sep-2008	14.67	NP	0.00	17.24	0.00	0.00	0.00
	29-Dec-2008	13.91	NP	0.00	18.00	0.00	0.00	0.00
	10-Mar-2009	14.18	NP	0.00	17.73	0.00	0.00	0.00
	4-Jun-2009	14.24	NP	0.00	17.67	0.00	0.00	0.00
HC-23 (32.74)	13-Nov-2003	15.28	NP	0.00	17.46	0.00	0.00	0.00
	26-Nov-2003	14.88	NP	0.00	17.86	0.00	0.00	0.00
	24-Dec-2003	15.23	15.15	0.08	17.58	Trace	Trace	< 0.01
	30-Dec-2003	15.22	15.05	0.17	17.67	Trace	Trace	< 0.01
	9-Jan-2004	14.85	14.77	0.08	17.96	Trace	Trace	0.01
	15-Jan-2004	14.61	NP	0.00	18.13	0.00	Trace	0.00
	21-Jan-2004	14.42	14.41	0.01	18.33	Trace	Trace	0.01
	3-Feb-2004	14.05	NP	0.00	18.69	0.00	Trace	0.00
	18-Feb-2004	14.05	NP	0.00	18.69	0.00	Trace	0.00
	25-Feb-2004	13.98	NP	0.00	18.76	0.00	Trace	0.00
	10-Mar-2004	14.15	NP	0.00	18.59	0.00	Trace	0.00
	24-Mar-2004	14.33	NP	0.00	18.41	0.00	Trace	0.00
	14-Jan-2005	--	--	--	--	--	--	--
	21-Jan-2005	15.35	15.30	0.05	17.43	Trace	Trace	0.00
	28-Jan-2005	15.28	15.27	0.01	17.47	0.00	0.00	0.00
	25-Feb-2005	15.31	15.30	0.01	17.44	0.00	0.00	0.00
	25-Mar-2005	15.48	15.45	0.03	17.29	0.00	0.00	0.03
	30-Apr-2005	15.18	NP	0.00	17.56	0.00	0.00	0.00
	31-May-2005	14.95	NP	0.00	17.79	0.00	0.00	0.00
	24-Jun-2005	15.01	14.96	0.05	17.77	0.00	0.00	0.05
	29-Jul-2005	16.25	16.25	0.00	16.49	0.00	0.00	0.00
	26-Aug-2005	15.51	15.30	0.21	17.42	0.50	0.50	0.05
	9-Sep-2005	15.49	15.40	0.09	17.33	0.00	0.50	0.09
	24-Sep-2005	15.64	15.47	0.17	17.25	0.05	0.55	0.05
	10-Oct-2005	15.55	15.52	0.03	17.22	0.00	0.55	0.03
	21-Oct-2005	15.47	15.45	0.02	17.29	0.00	0.55	0.02
	28-Nov-2005	15.27	15.27	0.00	17.47	0.00	0.55	< 0.01
	3-Jan-2006	14.75	NP	0.00	17.99	0.00	0.55	0.00
	17-Feb-2006	13.73	NP	0.00	19.01	0.00	0.55	0.00
	13-Mar-2006	13.91	NP	0.00	18.83	0.00	0.55	0.00
	19-Sep-2006	15.25	15.23	0.02	17.51	0.00	0.55	0.02
	13-Dec-2006	14.68	14.65	0.03	18.09	0.00	0.55	0.03
	29-Mar-2007	14.20	14.19	0.01	18.55	0.00	0.55	0.01
	27-Jun-2007	14.93	14.91	0.02	17.83	0.00	0.55	0.02
	18-Sep-2007	15.59	15.56	0.03	17.18	0.00	0.55	0.03
	6-Dec-2007	15.51	NP	0.00	17.23	0.00	0.55	0.03
	10-Mar-2008	14.37	NP	0.00	18.37	0.00	0.55	0.00
	12-Jun-2008	14.65	NP	0.00	18.09	0.00	0.55	0.00
	8-Sep-2008	15.50	NP	0.00	17.24	0.00	0.55	0.00
	29-Dec-2008	15.50	NP	0.00	17.24	0.00	0.55	0.00
	10-Mar-2009	15.04	NP	0.00	17.70	0.00	0.55	0.00
	4-Jun-2009	15.04	NP	0.00	17.70	0.00	0.55	0.00
	9-Sep-2009	15.81	NP	0.00	16.93	0.00	0.55	0.00
	15-Dec-2009	15.12	NP	0.00	17.62	0.00	0.55	0.00
	11-Mar-2010	14.55	NP	0.00	18.19	0.00	0.55	0.00
	8-Jun-2010	14.48	NP	0.00	18.26	0.00	0.55	0.00
	16-Sep-2010	15.11	NP	0.00	17.63	0.00	0.55	0.00
	13-Dec-2010	14.60	NP	0.00	18.14	0.00	0.55	0.00
	9-Jun-2011	13.60	SHEEN	0.00	19.14	0.00	0.55	0.00
	1-Dec-2011	14.93	NP	0.00	17.81	0.00	0.55	0.00
	11-Jun-2012	14.00	NP	0.00	18.74	0.00	0.55	0.00
	19-Dec-2012	14.12	NP	0.00	18.62	0.00	0.55	0.00
	17-Dec-2013	15.68	15.57	0.11	17.16	0.10	0.65	SHEEN
	11-Dec-2014	17.05	NP	0.00	15.69	0.00	0.65	0.00
	15-Dec-2015	14.62	NP	0.00	18.12	0.00	0.65	0.00
	19-Dec-2016	14.42	NP	0.00	18.32	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-24 (30.04)	13-Nov-2003	15.08	NP	0.00	14.96	0.00	0.00	0.00
	26-Nov-2003	14.68	NP	0.00	15.36	0.00	0.00	0.00
	24-Dec-2003	13.82	NP	0.00	16.22	0.00	0.00	0.00
	21-Jan-2004	13.13	NP	0.00	16.91	0.00	0.00	0.00
	25-Feb-2004	12.35	NP	0.00	17.69	0.00	0.00	0.00
	24-Mar-2004	12.61	NP	0.00	17.43	0.00	0.00	0.00
	14-Jan-2005	14.90	NP	0.00	15.14	0.00	0.00	0.00
	28-Jan-2005	15.79	NP	0.00	14.25	0.00	0.00	0.00
	25-Feb-2005	14.80	14.80	0.00	15.24	0.00	0.00	0.00
	25-Mar-2005	15.07	15.07	0.00	14.97	0.00	0.00	0.00
	30-Apr-2005	14.62	NP	0.00	15.42	0.00	0.00	0.00
	31-May-2005	17.34	NP	0.00	12.70	0.00	0.00	0.00
	24-Jun-2005	14.30	NP	0.00	15.74	0.00	0.00	0.00
	29-Jul-2005	14.60	NP	0.00	15.44	0.00	0.00	0.00
	26-Aug-2005	14.92	NP	0.00	15.12	0.00	0.00	0.00
	24-Sep-2005	15.18	NP	0.00	14.86	0.00	0.00	0.00
	21-Oct-2005	15.33	NP	0.00	14.71	0.00	0.00	0.00
	28-Nov-2005	14.55	NP	0.00	15.49	0.00	0.00	0.00
	3-Jan-2006	13.53	NP	0.00	16.51	0.00	0.00	0.00
	17-Feb-2006	12.23	NP	0.00	17.81	0.00	0.00	0.00
	13-Mar-2006	12.38	NP	0.00	17.66	0.00	0.00	0.00
	27-Jun-2006	13.31	NP	0.00	16.73	0.00	0.00	0.00
	19-Sep-2006	14.64	NP	0.00	15.40	0.00	0.00	0.00
	13-Dec-2006	12.84	NP	0.00	17.20	0.00	0.00	0.00
	29-Mar-2007	12.30	NP	0.00	17.74	0.00	0.00	0.00
	27-Jun-2007	13.74	13.73	0.01	16.31	0.00	0.00	0.01
	18-Sep-2007	14.99	NP	0.00	15.05	0.00	0.00	0.00
	6-Dec-2007	13.13	NP	0.00	16.91	0.00	0.00	0.00
	10-Mar-2008	12.72	NP	0.00	17.32	0.00	0.00	0.00
	12-Jun-2008	13.22	NP	0.00	16.82	0.00	0.00	0.00
	8-Sep-2008	14.68	NP	0.00	15.36	0.00	0.00	0.00
	29-Dec-2008	13.05	NP	0.00	16.99	0.00	0.00	0.00
	10-Mar-2009	13.92	NP	0.00	16.12	0.00	0.00	0.00
	4-Jun-2009	13.89	NP	0.00	16.15	0.00	0.00	0.00
	9-Sep-2009	15.01	NP	0.00	15.03	0.00	0.00	0.00
	15-Dec-2009	14.09	NP	0.00	15.95	0.00	0.00	0.00
	11-Mar-2010	12.65	NP	0.00	17.39	0.00	0.00	0.00
	8-Jun-2010	12.57	NP	0.00	17.47	0.00	0.00	0.00
	16-Sep-2010	15.05	SHEEN	0.00	14.99	0.00	0.00	0.00
	13-Dec-2010	12.31	SHEEN	0.00	17.73	0.00	0.00	0.00
	9-Jun-2011	11.84	NP	0.00	18.20	0.00	0.00	0.00
	1-Dec-2011	13.29	NP	0.00	16.75	0.00	0.00	0.00
	11-Jun-2012	12.22	NP	0.00	17.82	0.00	0.00	0.00
	19-Dec-2012	12.02	NP	0.00	18.02	0.00	0.00	0.00
	17-Dec-2013	14.64	NP	0.00	15.40	0.00	0.00	0.00
	11-Dec-2014	13.29	NP	0.00	16.75	0.00	0.00	0.00
	15-Dec-2015	11.87	NP	0.00	18.17	0.00	0.00	0.00
	19-Dec-2016	12.33	NP	0.00	17.71	0.00	0.00	0.00
EX-1 (33.08)	27-Aug-2003	15.78	NP	0.00	14.26	0.00	0.00	0.00
	3-Sep-2003	15.88	NP	0.00	14.16	0.00	0.00	0.00
	11-Sep-2003	16.06	NP	0.00	13.98	0.00	0.00	0.00
	17-Sep-2003	16.21	NP	0.00	13.83	0.00	0.00	0.00
	30-Sep-2003	16.22	NP	0.00	13.82	0.00	0.00	0.00
	14-Oct-2003	16.25	NP	0.00	13.79	0.00	0.00	0.00
	29-Oct-2003	16.38	NP	0.00	13.66	0.00	0.00	0.00
	13-Nov-2003	16.45	NP	0.00	13.59	0.00	0.00	0.00
	26-Nov-2003	16.07	NP	0.00	13.97	0.00	0.00	0.00
	24-Dec-2003	15.46	NP	0.00	14.58	0.00	0.00	0.00
	21-Jan-2004	15.06	NP	0.00	14.98	0.00	0.00	0.00
	25-Feb-2004	14.53	NP	0.00	15.51	0.00	0.00	0.00
	24-Mar-2004	14.84	NP	0.00	15.20	0.00	0.00	0.00
	28-Jan-2005	15.79	NP	0.00	14.25	0.00	0.00	0.00
	25-Feb-2005	14.80	14.80	0.00	15.24	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
EX-1 (continued)	25-Mar-2005	15.07	15.07	0.00	14.97	0.00	0.00	0.00
	30-Apr-2005	14.62	NP	0.00	15.42	0.00	0.00	0.00
	31-May-2005	17.34	NP	0.00	12.70	0.00	0.00	0.00
	24-Jun-2005	14.30	NP	0.00	15.74	0.00	0.00	0.00
	29-Jul-2005	14.60	NP	0.00	15.44	0.00	0.00	0.00
	26-Aug-2005	14.92	NP	0.00	15.12	0.00	0.00	0.00
	24-Sep-2005	15.18	NP	0.00	14.86	0.00	0.00	0.00
	21-Oct-2005	15.33	NP	0.00	14.71	0.00	0.00	0.00
	28-Nov-2005	14.55	NP	0.00	15.49	0.00	0.00	0.00
	3-Jan-2006	13.53	NP	0.00	16.51	0.00	0.00	0.00
	17-Feb-2006	12.23	NP	0.00	17.81	0.00	0.00	0.00
	13-Mar-2006	12.38	NP	0.00	17.66	0.00	0.00	0.00
	27-Jun-2006	13.31	NP	0.00	16.73	0.00	0.00	0.00
	19-Sep-2006	14.64	NP	0.00	15.40	0.00	0.00	0.00
	13-Dec-2006	12.84	NP	0.00	17.20	0.00	0.00	0.00
	29-Mar-2007	12.30	NP	0.00	17.74	0.0	0.0	0.00
	27-Jun-2007	13.74	13.73	0.01	16.31	0.0	0.0	0.01
	18-Sep-2007	14.99	NP	0.00	15.05	0.0	0.0	0.00
	6-Dec-2007	13.13	NP	0.00	16.91	0.0	0.0	0.00
	10-Mar-2008	12.72	NP	0.00	17.32	0.0	0.0	0.00
	12-Jun-2008	13.22	NP	0.00	16.82	0.0	0.0	0.00
	8-Sep-2008	14.68	NP	0.00	15.36	0.0	0.0	0.00
	29-Dec-2008	13.05	NP	0.00	16.99	0.0	0.0	0.00
	10-Mar-2009	--	--	--	--	--	--	--
	24-Jun-2009	--	--	--	--	--	--	--
BE-1 (19.75)	24-Jun-2005	10.01	NP	0.00	9.74	0.00	0.00	0.00
	29-Jul-2005	10.23	NP	0.00	9.52	0.00	0.00	0.00
	26-Aug-2005	10.27	NP	0.00	9.48	0.00	0.00	0.00
	24-Sep-2005	10.22	NP	0.00	9.53	0.00	0.00	0.00
	21-Oct-2005	10.10	NP	0.00	9.65	0.00	0.00	0.00
	28-Nov-2005	9.91	NP	0.00	9.84	0.00	0.00	0.00
	3-Jan-2006	--	--	--	--	--	--	--
	17-Feb-2006	9.61	NP	0.00	10.14	0.00	0.00	0.00
	13-Mar-2006	9.55	NP	0.00	10.20	0.00	0.00	0.00
	27-Jun-2006	9.66	NP	0.00	10.09	0.00	0.00	0.00
	19-Sep-2006	10.10	NP	0.00	9.65	0.00	0.00	0.00
	13-Dec-2006	6.57	NP	0.00	13.18	0.00	0.00	0.00
	29-Mar-2007	6.23	NP	0.00	13.52	0.00	0.00	0.00
	27-Jun-2007	6.76	NP	0.00	12.99	0.00	0.00	0.00
	18-Sep-2007	7.79	NP	0.00	11.96	0.00	0.00	0.00
	6-Dec-2007	6.38	NP	0.00	13.37	0.00	0.00	0.00
	10-Mar-2008	6.49	NP	0.00	13.26	0.00	0.00	0.00
	12-Jun-2008	3.90	NP	0.00	15.85	0.00	0.00	0.00
	8-Sep-2008	7.08	NP	0.00	12.67	0.00	0.00	0.00
	29-Dec-2008	6.51	NP	0.00	13.24	0.00	0.00	0.00
	10-Mar-2009	6.89	NP	0.00	12.86	0.00	0.00	0.00
	4-Jun-2009	5.63	NP	0.00	14.12	0.00	0.00	0.00
	9-Sep-2009	7.25	NP	0.00	12.50	0.00	0.00	0.00
	15-Dec-2009	7.01	NP	0.00	12.74	0.00	0.00	0.00
	11-Mar-2010	6.72	NP	0.00	13.03	0.00	0.00	0.00
	8-Jun-2010	2.40	NP	0.00	17.35	0.00	0.00	0.00
	16-Sep-2010	6.86	NP	0.00	12.89	0.00	0.00	0.00
	13-Dec-2010	6.15	NP	0.00	13.60	0.00	0.00	0.00
	12-Jun-2012	5.30	NP	0.00	14.45	0.00	0.00	0.00
	19-Dec-2012	5.88	NP	0.00	13.87	0.00	0.00	0.00
	17-Dec-2013	6.84	NP	0.00	12.91	0.00	0.00	0.00
	11-Dec-2014	6.24	NP	0.00	13.51	0.00	0.00	0.00
	15-Dec-2015	5.94	NP	0.00	13.81	0.00	0.00	0.00
	19-Dec-2016	6.34	NP	0.00	13.41	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
BE-2	24-Jun-2005	8.94	NP	0.00	10.75	0.00	0.00	0.00
	29-Jul-2005	9.04	NP	0.00	10.65	0.00	0.00	0.00
	26-Aug-2005	9.12	NP	0.00	10.57	0.00	0.00	0.00
	24-Sep-2005	6.02	NP	0.00	13.67	0.00	0.00	0.00
	21-Oct-2005	8.95	NP	0.00	10.74	0.00	0.00	0.00
	28-Nov-2005	8.64	NP	0.00	11.05	0.00	0.00	0.00
	3-Jan-2006	--	--	--	--	--	--	--
	17-Feb-2006	8.43	NP	0.00	11.26	0.00	0.00	0.00
	13-Mar-2006	8.21	NP	0.00	11.48	0.00	0.00	0.00
	27-Jun-2006	8.45	NP	0.00	11.24	0.00	0.00	0.00
	19-Sep-2006	8.79	NP	0.00	10.90	0.00	0.00	0.00
	13-Dec-2006	8.57	NP	0.00	11.12	0.00	0.00	0.00
	29-Mar-2007	8.07	NP	0.00	11.62	0.00	0.00	0.00
	27-Jun-2007	8.55	NP	0.00	11.14	0.00	0.00	0.00
	18-Sep-2007	8.90	NP	0.00	10.79	0.00	0.00	0.00
	6-Dec-2007	7.89	NP	0.00	11.80	0.00	0.00	0.00
	10-Mar-2008	8.21	NP	0.00	11.48	0.00	0.00	0.00
	12-Jun-2008	5.73	NP	0.00	13.96	0.00	0.00	0.00
	8-Sep-2008	8.98	NP	0.00	10.71	0.00	0.00	0.00
	29-Dec-2008	Well Destroyed						
BE-3 (17.55)	24-Jun-2005	6.42	NP	0.00	11.13	0.00	0.00	0.00
	29-Jul-2005	6.66	NP	0.00	10.89	0.00	0.00	0.00
	26-Aug-2005	6.79	NP	0.00	10.76	0.00	0.00	0.00
	24-Sep-2005	6.80	NP	0.00	10.75	0.00	0.00	0.00
	21-Oct-2005	6.75	NP	0.00	10.80	0.00	0.00	0.00
	28-Nov-2005	6.58	NP	0.00	10.97	0.00	0.00	0.00
	3-Jan-2006	--	--	--	--	--	--	--
	17-Feb-2006	6.64	NP	0.00	10.91	0.00	0.00	0.00
	13-Mar-2006	6.47	NP	0.00	11.08	0.00	0.00	0.00
	27-Jun-2006	6.31	NP	0.00	11.24	0.00	0.00	0.00
	19-Sep-2006	6.83	NP	0.00	10.72	0.00	0.00	0.00
	13-Dec-2006	9.47	NP	0.00	8.08	0.00	0.00	0.00
	29-Mar-2007	9.44	NP	0.00	8.11	0.00	0.00	0.00
	27-Jun-2007	9.99	NP	0.00	7.56	0.00	0.00	0.00
	18-Sep-2007	10.13	NP	0.00	7.42	0.00	0.00	0.00
	6-Dec-2007	8.79	NP	0.00	8.76	0.00	0.00	0.00
	10-Mar-2008	10.41	NP	0.00	7.14	0.00	0.00	0.00
	12-Jun-2008	5.97	NP	0.00	11.58	0.00	0.00	0.00
	8-Sep-2008	10.18	NP	0.00	7.37	0.00	0.00	0.00
	29-Dec-2008	9.59	NP	0.00	7.96	0.00	0.00	0.00
	10-Mar-2009	9.85	NP	0.00	7.70	0.00	0.00	0.00
	4-Jun-2009	8.13	NP	0.00	9.42	0.00	0.00	0.00
	9-Sep-2009	10.36	NP	0.00	7.19	0.00	0.00	0.00
	15-Dec-2009	9.88	NP	0.00	7.67	0.00	0.00	0.00
	11-Mar-2010	9.65	NP	0.00	7.90	0.00	0.00	0.00
	8-Jun-2010	4.60	NP	0.00	12.95	0.00	0.00	0.00
	16-Sep-2010	9.81	NP	0.00	7.74	0.00	0.00	0.00
	13-Dec-2010	8.67	NP	0.00	8.88	0.00	0.00	0.00
	9-Jun-2011	1.89	NP	0.00	15.66	0.00	0.00	0.00
	1-Dec-2011	9.63	NP	0.00	7.92	0.00	0.00	0.00
	11-Jun-2012	7.16	NP	0.00	10.39	0.00	0.00	0.00
	19-Dec-2012	8.09	NP	0.00	9.46	0.00	0.00	0.00
	17-Dec-2013	9.96	NP	0.00	7.59	0.00	0.00	0.00
	11-Dec-2014	9.13	NP	0.00	8.42	0.00	0.00	0.00
	15-Dec-2015	8.37	NP	0.00	9.18	0.00	0.00	0.00
	19-Dec-2016	9.25	NP	0.00	8.30	0.00	0.00	0.00
BE-4	24-Jun-2005	18.81	NP	0.00	12.35	0.00	0.00	0.00
	29-Jul-2005	19.14	NP	0.00	12.02	0.00	0.00	0.00
	26-Aug-2005	19.07	NP	0.00	12.09	0.00	0.00	0.00
	24-Sep-2005	18.75	NP	0.00	12.41	0.00	0.00	0.00
	21-Oct-2005	18.29	NP	0.00	12.87	0.00	0.00	0.00
	28-Nov-2005	17.39	17.39	0.00	13.77	0.00	0.00	0.00

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
BE-4 (continued)	3-Jan-2006	14.72	14.69	0.03	16.47	0.00	0.00	0.03
	17-Feb-2006	14.88	14.82	0.06	16.33	0.00	0.00	0.06
	13-Mar-2006	15.55	15.51	0.04	15.65	0.00	0.00	0.04
	27-Jun-2006	16.03	15.95	0.08	15.20	0.00	0.00	0.08
	19-Sep-2006	17.01	16.79	0.22	14.35	0.75	0.75	0.02
	13-Dec-2006	15.67	15.66	0.01	15.50	0.00	0.75	0.02
	29-Mar-2007	15.25	15.18	0.07	15.97	0.00	0.75	0.07
	27-Jun-2007	16.51	16.31	0.20	14.83	1.00	1.75	0.01
	9-Aug-2007	16.85	16.47	0.38	14.65	0.50	2.25	0.01
	22-Aug-2007	16.82	16.58	0.24	14.55	1.00	3.25	0.01
	7-Sep-2007	17.62	16.76	0.86	14.31	1.50	4.75	0.01
	14-Sep-2007	18.16	18.06	0.10	13.09	0.25	5.00	0.00
	4-Oct-2007	16.81	16.71	0.10	14.44	0.40	5.40	0.00
	11-Oct-2007	16.74	16.66	0.08	14.49	0.00	5.40	0.08
	24-Oct-2007	16.62	16.54	0.08	14.61	0.00	5.40	0.08
	8-Nov-2007	16.78	16.71	0.07	14.44	0.00	5.40	0.07
	21-Nov-2007	16.68	16.60	0.08	14.55	0.00	5.40	0.08
	7-Dec-2007	14.16	14.13	0.03	17.03	0.00	5.40	0.03
	21-Dec-2007	15.76	15.75	0.01	15.41	0.00	5.40	0.01
	3-Jan-2008	14.64	14.63	0.01	16.53	0.00	5.40	0.01
	18-Jan-2008	14.32	14.31	0.01	16.85	0.00	5.40	0.01
	24-Jan-2008	14.98	14.95	0.03	16.21	0.00	5.40	0.03
	31-Jan-2008	15.31	15.28	0.03	15.88	0.00	5.40	0.03
	6-Feb-2008	14.17	14.16	0.01	17.00	0.00	5.40	0.03
	15-Feb-2008	14.18	SHEEN	0.00	16.98	0.00	5.40	SHEEN
	29-Feb-2008	15.35	SHEEN	0.00	15.81	0.00	5.40	SHEEN
	10-Mar-2008	16.61	SHEEN	0.00	14.55	0.00	5.40	SHEEN
	21-Mar-2008	15.63	SHEEN	0.00	15.53	0.00	5.40	SHEEN
	11-Apr-2008	15.69	15.67	0.02	15.49	0.00	5.40	SHEEN
	17-Apr-2008	15.76	15.71	0.05	15.44	0.00	5.40	SHEEN
	24-Apr-2008	15.72	15.67	0.05	15.48	0.05	5.45	SHEEN
	2-May-2008	15.73	15.66	0.07	15.49	0.00	5.45	SHEEN
	8-May-2008	16.02	15.78	0.24	15.35	0.10	5.55	0.01
	14-May-2008	16.00	15.93	0.07	15.22	0.00	5.55	0.07
	30-May-2008	15.22	15.18	0.04	15.98	0.00	5.55	0.04
	13-Jun-2008	15.30	15.26	0.04	15.90	0.00	5.55	0.04
	25-Jun-2008	15.78	15.76	0.02	15.40	0.00	5.55	0.02
	11-Jul-2008	16.34	16.08	0.26	15.05	0.05	5.60	0.01
	28-Jul-2008	16.65	16.35	0.30	14.78	0.07	5.67	SHEEN
	13-Aug-2008	16.92	16.60	0.32	14.52	0.13	5.80	0.01
	27-Aug-2008	16.98	16.73	0.25	14.40	0.53	6.33	0.01
	8-Sep-2008	17.12	16.82	0.30	14.31	0.53	6.86	0.02
	18-Sep-2008	17.16	16.92	0.24	14.21	0.66	7.52	SHEEN
	30-Sep-2008	17.28	17.05	0.23	14.08	0.05	7.57	0.01
	16-Oct-2008	17.40	17.18	0.22	13.96	0.10	7.67	0.01
	30-Oct-2008	17.42	17.25	0.17	13.89	0.20	7.87	SHEEN
	14-Nov-2008	16.92	16.91	0.01	14.25	0.00	7.87	0.01
	26-Nov-2008	16.98	16.94	0.04	14.22	0.00	7.87	0.04
	29-Dec-2008	16.54	16.52	0.02	14.64	0.00	7.87	0.02
	15-Jan-2009	15.39	15.37	0.02	15.79	0.00	7.87	0.02
	23-Jan-2009	15.93	15.92	0.01	15.24	0.00	7.87	0.01
	29-Jan-2009	16.11	16.10	0.01	15.06	0.00	7.87	0.01
	4-Feb-2009	16.18	16.17	0.01	14.99	0.00	7.87	0.01
	12-Feb-2009	16.40	16.34	0.06	14.81	0.00	7.87	0.06
	19-Feb-2009	12.58	12.56	0.02	18.60	0.00	7.87	0.02
	10-Mar-2009	16.60	16.54	0.06	14.61	0.00	7.87	0.06
	27-Mar-2009	16.63	16.49	0.14	14.65	0.05	7.92	0.02
	16-Apr-2009	16.67	16.59	0.08	14.56	0.00	7.92	0.08
	14-May-2009	16.76	16.53	0.23	14.60	0.05	7.97	SHEEN
	4-Jun-2009	16.35	16.27	0.08	14.88	0.00	7.97	0.08
	13-Jul-2009	17.15	17.06	0.09	14.09	0.00	7.97	0.09
	10-Aug-2009	17.43	17.09	0.34	14.03	0.01	7.98	0.01
	9-Sep-2009	17.29	17.26	0.03	13.90	0.03	8.01	0.03
	15-Oct-2009	17.93	17.39	0.54	13.71	0.03	8.04	SHEEN
	18-Nov-2009	16.92	16.72	0.20	14.42	0.05	8.09	SHEEN
	15-Dec-2009	16.62	16.45	0.17	14.69	0.02	8.11	0.01

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
BE-4 (continued)	13-Jan-2010	15.64	15.56	0.08	15.59	0.00	8.11	0.08
	2-Mar-2010	15.74	15.66	0.08	15.49	0.00	8.11	0.08
	11-Mar-2010	15.78	15.70	0.08	15.45	0.00	8.11	0.08
	25-Mar-2010	15.95	15.80	0.15	15.34	0.10	8.21	0.01
	2-Apr-2010	15.65	15.65	SHEEN	15.65	0.00	8.21	SHEEN
	9-Apr-2010	15.62	15.41	0.21	15.73	0.25	8.46	0.08
	16-Apr-2010	15.67	15.45	0.22	15.69	0.25	8.71	0.01
	23-Apr-2010	15.70	15.62	0.08	15.53	0.00	8.71	0.08
	8-Jun-2010	13.61	13.59	0.02	17.57	0.00	8.71	0.02
	9-Jul-2010	14.63	14.61	0.02	16.55	0.00	8.71	0.02
	23-Jul-2010	15.90	15.89	0.01	15.27	0.00	8.71	0.01
	6-Aug-2010	16.29	16.00	0.29	15.13	0.25	8.96	0.05
	19-Aug-2010	16.37	16.31	0.06	14.84	0.00	8.96	0.05
	27-Aug-2010	16.41	16.19	0.22	14.95	0.50	9.46	0.04
	17-Sep-2010	16.55	16.33	0.22	14.81	0.25	9.71	0.05
	8-Oct-2010	16.44	16.42	0.02	14.74	0.00	9.71	0.02
	11-Nov-2010	16.94	16.81	0.13	14.34	0.05	9.76	0.01
	15-Dec-2010	14.22	14.06	0.16	17.08	0.25	10.01	0.02
	21-Dec-2010	14.15	13.95	0.20	17.19	0.20	10.21	0.02
	30-Dec-2010	13.68	13.25	0.43	17.86	0.50	10.71	0.01
	6-Jan-2011	13.67	13.64	0.03	17.52	0.00	10.71	0.03
	13-Jan-2011	13.92	13.89	0.03	17.27	0.00	10.71	0.03
	19-Jan-2011	13.87	13.83	0.04	17.33	0.00	10.71	0.04
	28-Jan-2011	14.13	14.11	0.02	17.05	0.00	10.71	0.02
	9-Feb-2011	15.03	15.01	0.02	16.15	0.00	10.71	0.02
	23-Feb-2011	15.18	15.17	0.01	15.99	0.00	10.71	0.01
	9-Mar-2011	15.38	15.34	0.04	15.82	0.00	10.71	0.04
	29-Mar-2011	14.00	13.96	0.04	17.20	0.00	10.71	0.04
	21-Apr-2011	13.93	13.90	0.03	17.26	0.00	10.71	0.03
	6-May-2011	14.14	14.10	0.04	17.06	0.00	10.71	0.04
	9-Jun-2011	13.02	13.01	0.01	18.15	0.00	10.71	0.01
	7-Jul-2011	14.17	13.89	0.28	17.24	0.25	10.96	SHEEN
	3-Aug-2011	15.31	15.29	0.02	15.87	0.00	10.96	0.02
	8-Sep-2011	15.86	15.79	0.07	15.36	0.00	10.96	0.07
	3-Oct-2011	16.18	16.03	0.15	15.11	0.20	11.16	0.01
	10-Nov-2011	16.50	16.37	0.13	14.78	0.20	11.36	SHEEN
	1-Dec-2011	17.96	17.88	0.08	13.27	0.00	11.36	0.08
	6-Jan-2012	16.13	16.09	0.04	15.07	0.00	11.36	0.04
	25-Jan-2012	15.84	15.80	0.04	15.36	0.00	11.36	0.04
	3-Mar-2012	15.63	15.58	0.05	15.57	0.00	11.36	0.05
	14-Mar-2012	15.27	15.25	0.02	15.91	0.00	11.36	0.02
	22-Mar-2012	14.40	14.38	0.02	16.78	0.00	11.36	0.02
	29-Mar-2012	14.34	14.31	0.03	16.85	0.00	11.36	0.03
	5-Apr-2012	13.73	13.72	0.01	17.44	0.00	11.36	0.01
	13-Apr-2012	14.35	14.30	0.05	16.85	0.00	11.36	0.05
	23-Apr-2012	14.37	14.32	0.05	16.83	0.00	11.36	0.05
	14-May-2012	14.38	14.35	0.03	16.81	0.00	11.36	0.03
	25-May-2012	--	--	--	--	--	--	--
	12-Jun-2012	14.75	14.73	0.02	16.43	0.00	11.36	0.02
	3-Jul-2012	14.86	14.85	0.01	16.31	0.00	11.36	0.01
	28-Aug-2012	16.01	15.96	0.05	15.19	0.00	11.36	0.05
	24-Sep-2012	Well Not Accessible						
	8-Oct-2012	16.44	16.40	0.04	14.76	0.00	11.36	0.04
	14-Nov-2012	16.04	SHEEN	0.00	15.12	0.00	11.36	SHEEN
	19-Dec-2012	14.16	14.09	0.07	17.06	0.00	11.36	0.07
	4-Jan-2013	14.21	14.09	0.12	17.06	0.10	11.46	0.01
	18-Jan-2013	15.07	15.04	0.03	16.12	0.00	11.46	0.01
	31-Jan-2013	15.39	15.38	0.01	15.78	0.00	11.46	0.01
	6-Mar-2013	15.76	15.74	0.02	15.42	0.00	11.46	0.01
	3-Apr-2013	16.13	16.11	0.02	15.05	0.00	11.46	0.01
	6-May-2013	16.39	16.38	0.01	14.78	0.00	11.46	0.01
	12-Jun-2013	16.15	16.14	0.01	15.02	0.00	11.46	0.01
	16-Jul-2013	16.60	16.40	0.20	14.74	0.10	11.56	0.05
	26-Aug-2013	17.31	17.30	0.01	13.86	0.00	11.56	0.01
	25-Sep-2013	17.90	17.88	0.02	13.28	0.00	11.56	0.02

Please refer to notes at end of table.

Table 1
Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID [Casing Elevation]	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
BE-4 (continued)	31-Oct-2013	18.68	18.61	0.07	12.54	0.00	11.56	0.07
	27-Nov-2013	16.78	16.78	0.00	14.38	0.00	11.56	SHEEN
	17-Dec-2013	16.84	16.80	0.04	14.36	0.00	11.56	0.02
	11-Dec-2014	16.06	15.99	0.07	15.16	0.00	11.56	0.02
	15-Dec-2015	16.20	16.00	0.20	15.14	0.00	11.56	0.20
	17-Feb-2016	14.54	14.40	0.14	16.74	0.50	12.06	0.01
	29-Mar-2016	14.12	14.11	0.01	17.05	0.10	12.16	SHEEN
	27-Apr-2016	15.19	15.18	0.01	15.98	0.10	12.26	SHEEN
	27-May-2016	15.81	15.80	0.01	15.36	0.00	12.26	0.01
	29-Jun-2016	16.25	16.20	0.05	14.95	0.00	12.26	0.05
	20-Jul-2016	16.39	16.34	0.05	14.81	0.00	12.26	0.05
	31-Aug-2016	16.70	16.65	0.05	14.50	0.00	12.26	0.05
	16-Sep-2016	16.92	16.88	0.04	14.28	0.00	12.26	0.04
	20-Oct-2016	16.38	16.35	0.03	14.81	0.00	12.26	0.03
	28-Nov-2016	15.48	15.48	0.00	15.68	0.00	12.26	SHEEN
	19-Dec-2016	15.19	15.18	0.01	15.98	0.00	12.26	0.01
BE-5 (21.12)	9-Sep-2009	11.08	NP	0.00	10.04	0.00	0.00	0.00
	15-Dec-2009	10.87	NP	0.00	10.25	0.00	0.00	0.00
	11-Mar-2010	10.61	NP	0.00	10.51	0.00	0.00	0.00
	8-Jun-2010	6.04	NP	0.00	15.08	0.00	0.00	0.00
	16-Sep-2010	10.87	NP	0.00	10.25	0.00	0.00	0.00
	13-Dec-2010	9.52	NP	0.00	11.60	0.00	0.00	0.00
	9-Jun-2011	3.29	NP	0.00	17.83	0.00	0.00	0.00
	1-Dec-2011	10.83	NP	0.00	10.29	0.00	0.00	0.00
	11-Jun-2012	8.33	NP	0.00	12.79	0.00	0.00	0.00
	19-Dec-2012	9.24	NP	0.00	11.88	0.00	0.00	0.00
	17-Dec-2013	11.12	NP	0.00	10.00	0.00	0.00	0.00
	11-Dec-2014	10.10	NP	0.00	11.02	0.00	0.00	0.00
	15-Dec-2015	9.39	NP	0.00	11.73	0.00	0.00	0.00
	19-Dec-2016	10.19	NP	0.00	10.93	0.00	0.00	0.00

Notes:

1. The LNAPL monitoring program was reduced in March 2006 to include only wells MW-19 and MW-20, approved by the DEQ in an April 6, 2006 letter.
2. Passive product skimmers were installed in wells MW-19 and MW-20 in June 2006; water level measurements were discontinued.
3. NP = No Product at the time of the monitoring event.
4. * Phreatic Elevation = (Casing Elevation - Depth to Water) + S_g * (Product Thickness). S_g = 0.89
5. -- = Not measured or not applicable.
6. Datum is NGVD 29 = National Geodetic Vertical Datum of 1929.

Table 2
Summary of Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Sample Point	Sample Date	Analyte Concentration in µg/L (ppb)																		
		Total Petroleum Hydrocarbons		Polycyclic Aromatic Hydrocarbons (PAHs)																
		Diesel-Range	Residual-Range	Acenaphthene	Acenaphthylene	Anthracene	BAA	BAP	BBF	BGP	BKF	Chrysene	DAA	Fluoranthene	Fluorene	ICP	Naphthalene	Phenanthrene	Pyrene	
South Slip 3 Area																				
HC-2	11/5/1998	--	--	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
	5/10/2004	<250	< 500	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
	2/11/2005	120 J	310 J	< 0.021	--	--	0.0053	< 0.021	--	--	--	--	--	0.0084	< 0.021	--	0.14	0.0069	--	
	6/2/2005	20 J	< 500	0.0058 J	0.0055 J	0.027	0.0043 J	0.0044 J	0.0056 J	0.0046 J	0.0042 J	0.0049 J	< 0.020	0.0086 J	0.0094 J	0.0052 J	0.026	0.017 J	0.0075 J	
	9/15/2005	<238	< 476	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.196	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	
	12/9/2005	<236	< 472	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	
	6/28/2006	<240	< 481	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	
	6/27/2007	<238	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	
	6/12/2008	<236	<472	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	
	6/4/2009	<238	<476	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	
	HC-5	11/12/1998	--	--	< 2.5	< 2.5	< 0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 2.5	< 0.1	< 0.1	< 0.5	< 0.1
		5/10/2004	990,000	< 50,000	< 25	< 25	27.6	0.742	< 0.5	< 0.5	< 0.5	< 0.5	1.65	< 1.0	< 25	86.1	< 0.5	< 37.5	43.0	14.9
		6/10/2004	102,000	< 5,000	11.4	< 10	< 10	0.422	< 0.25	< 0.25	< 0.5	< 0.25	0.815	< 0.25	< 10	35.3	< 0.25	16.8	17.4	4.68
2/11/2005		26,000 J	4,800 J	0.65	--	--	< 0.02	< 0.02	--	--	--	--	--	0.07	2.9	--	< 0.19	0.28	--	
6/2/2005		3,200 Y	< 500	0.26	< 0.064	< 0.37	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.096	2.7	< 0.020	< 0.17	< 0.21	< 0.020	
9/15/2005		1,510 J	< 476	0.973	< 0.476	< 0.476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	4.21	< 0.0952	< 0.952	< 0.476	< 0.143	
12/7/2005		1,940	< 485	< 0.143	< 0.0952	< 0.238	< 0.0952	< 0.476	< 0.476	< 0.476	< 0.476	< 0.0952	< 0.952	< 0.0952	1.15	< 0.476	< 0.143	< 0.143	< 0.238	
6/28/2006		2,990	< 476	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.381	< 0.190	1.10	< 0.190	< 0.190	< 0.190	< 0.190	
6/27/2007		856	< 476	0.835	< 0.288	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.385	< 0.192	3.08	< 0.192	0.421	< 0.288	< 0.192	
6/12/2008		1,050 Q11	<472	0.495	0.476	0.190	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	1.55	<0.0952	0.266	<0.190	<0.0952	
6/4/2009		999 Q11	<476	0.279	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	1.41	<0.0952	< 0.143	< 0.143	<0.0952	
9/16/2010		2,810 Q11	<400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
6/10/2011		5,220 Q11	156 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
6/11/2012		3,600 Q11	<400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/20/2012		1,200 J	<480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/20/12 DUP		640 J	<480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/17/2013		2,200 JY	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/17/2013 DUP		4,600 JY	890	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/12/2014		9,200 JY #	2,100 JY #	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/12/2014 DUP		6,100 JY #	1,300 JY #	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
12/16/2015	8,000	840 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
12/16/2015 DUP	9,200	1,300 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
12/19/2016	4300 J	580 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
12/19/16 DUP	6100 J	1900 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
BEBRA Area																				
HC-19	5/10/2004	10,800	1,420	< 1.5	< 0.5	< 1.25	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.5	4.3	< 0.5	< 1.75	< 1.0	< 0.5	
	2/11/2005	9,700 J	1,800 J	1.0	--	--	0.014	0.016	--	--	--	--	--	0.041	3.1	--	< 0.26	0.054	--	
	6/3/2005	510 Y	< 500	0.72	< 0.086	0.21	0.023	0.034	0.028	0.025	0.025	0.041	< 0.020	0.076	2.8	0.028	< 0.19	0.17	0.12	
	9/15/2005	< 236	< 472	0.961	< 0.476	< 0.476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.48	< 0.0952	< 0.714	< 0.476	< 0.0952	
	12/7/2005	< 240	< 481	0.619	< 0.0962	< 0.144	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	2.10	< 0.0962	< 0.385	< 0.0962	0.0908 J	
	3/14/2006	211	< 481	0.402	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.204	< 0.102	1.02	< 0.102	< 0.102	< 0.102	< 0.102	
	6/28/2006	3,940	598	0.939	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.381	< 0.190	2.95	< 0.190	< 0.190	< 0.190	< 0.190	
	9/19/2006	< 238	< 476	0.583	< 0.0952	< 0.143	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	1.89	< 0.0952	< 0.143	< 0.0952	< 0.0952	
	12/13/2006	610	< 481	0.283	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	0.698	< 0.0962	< 0.0962	< 0.0962	< 0.0962	
	3/29/2007	324	< 476	< 0.143	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.660	< 0.0952	< 0.0952	< 0.0952	< 0.0952	
	6/27/2007	190 J	< 476	0.660	< 0.0962	< 0.192	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	1.87	< 0.0962	< 0.144	< 0.0962	< 0.0962	
	9/18/2007	< 236	< 472	0.775	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	1.95	< 0.0952	< 0.381	< 0.0952	< 0.0952	
	12/6/2007	407	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	&		

Table 2
Summary of Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Sample Point	Sample Date	Analyte Concentration in µg/L (ppb)																	
		Total Petroleum Hydrocarbons		Polycyclic Aromatic Hydrocarbons (PAHs)															
		Diesel-Range	Residual-Range	Acenaphthene	Acenaphthylene	Anthracene	BAA	BAP	BBF	BGP	BKF	Chrysene	DAA	Fluoranthene	Fluorene	ICP	Naphthalene	Phenanthrene	Pyrene
BE-4	6/3/2005	590 Y	< 500	1.9	< 0.25	< 0.22	0.012 J	< 0.020	< 0.020	< 0.020	< 0.020	0.034	< 0.020	0.036	3.8	< 0.020	< 0.31	< 0.088	0.084
	9/15/2005	1,560 J	< 476	< 0.714	< 0.476	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.19	< 0.0952	0.844	< 0.0952	< 0.476	< 0.190	< 0.0952
	12/7/2005 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/13/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/28/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/20/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/30/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/27/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/18/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/6/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/8/2008**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/29/2008**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/9/2009**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/5/2009**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/9/2009**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/15/2009**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/11/2010**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/8/2010**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/16/2010**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2011**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/9/2011**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-5	9/9/2009	<263	<526	<0.0952	<0.0952	<0.0952	0.184	0.217	0.194	0.166	0.174	0.216	<0.190	0.388	<0.0952	0.135	<0.238	<0.238	0.422
	12/15/2009	<236	<472	<0.0952	<0.0952	<0.0952	0.186	0.214	0.187	0.184	0.160	0.198	<0.190	0.352	<0.0952	0.152	<0.286	<0.238	0.382
	3/11/2010	<238	<476	<0.0952	<0.0952	<0.0952	<0.0952	0.102	<0.0952	<0.0952	<0.0952	0.098	<0.190	0.141	<0.0952	<0.0952	<0.0952	<0.0952	0.174
	6/8/2010	247 Q11	<472	<0.0952	<0.0952	<0.0952	0.151	0.175	0.147	0.141	0.129	0.175	<0.190	0.284	<0.0952	0.116	<0.0952	0.112	0.318
	9/16/2010	1,670 Q9	359 J	<0.0952	<0.0952	0.0963	0.214	0.274	0.252	0.226	0.203	0.259	<0.190	0.463	0.176	0.187	<0.143	0.316	0.499
	12/13/2010	659 Q12	354 J	<0.0952	<0.0952	<0.0952	0.163	0.223	0.203	0.184	0.165	0.211	<0.190	0.338	<0.0952	0.141	<0.0952	0.131	0.356
	6/9/2011	182 J	<400	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.189	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943
	12/1/2011	1,430 Q11	140 J	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.235	<0.118	<0.118	<0.118	<0.118	<0.118	0.155
	6/11/2012	610 Q11	<400	<0.095	<0.095	<0.095	0.16	0.21	0.19	0.16	0.18	0.20	<0.19	0.29	<0.095	0.13	<0.095	0.15	0.37
	12/19/2012	<400	<400	<0.098	<0.098	<0.098	0.26	0.31 B	0.25	0.28	0.19	0.27	<0.20	0.35	<0.098	0.33	<0.098	0.17	0.45
	12/17/2013	210 Y	<240	<0.095	<0.095	<0.14	<0.095	0.12	<0.095	<0.095	<0.095	<0.095	<0.19	<0.095	<0.14	0.11	<0.095	<0.095	0.12
	12/11/2014	2,700 Y	1,600 Y	0.042	0.020	0.058	0.16	0.20	0.260	0.180	0.100	0.190	0.043	0.290	0.037	0.22	0.11	0.12	0.31
	12/15/2015	150	<250	<0.020 H	<0.020 H	<0.020 H	0.049 H	0.042 H	0.10 H	0.070 H	0.029 H	0.062 H	<0.020 H	0.095 H	<0.020 H	0.059 H	0.022 H	0.040 H	0.10 H
	12/19/2016	770	450	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	0.023 B
HC-12D	11/13/1998	--	--	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<1.00	<0.100	<1.00	<0.500	<0.100
	2/16/1999	--	--	<5.00	<1.00	<2.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<1.00	5.210	<0.100	<1.00	8.190	<1.00
	5/18/1999	--	--	0.31	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<10.0	<0.100	<1.00	<1.00	<0.100
	8/25/1999	--	--	0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.200	<0.1	0.200	<0.1	<0.1
	12/12/2014	2,200 Y	290 Y	0.50	<0.02	<0.02	0.020	<0.02	0.023	0.021	<0.02	0.021	0.021	<0.02	0.360	0.03	0.120	0.072	<0.02
	12/16/2015	440	<250	0.22 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H
	12/19/2016	1,200	<250	0.26	<0.02	<0.02	<0.02	<0.02	0.021	<0.02	<0.03	<0.02	<0.02	0.049	<0.02	<0.02	0.075	<0.02	0.052 B

- Notes:**

 - = Data not available or sample not analyzed for listed analyte.
 - * = Sample did not include silica gel cleanup due to inadequate sample volume.
 - ** = Well not sampled due to presence of LNAPL in well at time of sampling.
 - J = Analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
 - O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
 - Y = The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard or resembles a hydrocarbon pattern for degraded fuel.
 - QP = Hydrocarbon result partly due to individual peak(s) in quantitation range.
 - Q11 = Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.
 - Q9 = Hydrocarbon pattern most closely resembles weathered diesel.
 - Polycyclic Aromatic Hydrocarbons (PAHs):

BAA = Benzo(a)anthracene

BKF = Benzo(k)fluoranthene

BGP = Benzo(g,h,i)perylene

ICP = Indeno(1,2,3-cd)pyrene

BBF = Benzo(b)fluoranthene

BAP = Benzo(a)pyrene

DAA = Dibenzo(a,h)anthracene
 - B = Reported concentration is less than fives times the value detected in the associated method blank.
 - Q12 = Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
 - # = Sheen observed on probe at time of sampling.
 - H = Sample analysis re-run outside of the specified hold-time due to laboratory control issues with the initial analysis.
 - < = Not detected at the listed concentration

TABLE 13A
GROUNDWATER CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			HCID (µg/L)			TPH (µg/L)		
Sample Location:	Sample ID:	Date Sampled:	Gasoline Range	Diesel Range	Residual Range	Gasoline Range	Diesel Range	Residual Range
T4S1MW01s	T4S1MW01s-GW-1	4/21/2004	--	--	--	50 U	300 U	590 U
T4S1MW01s	T4S1MW01s-GW-1	9/1/2004	250 U	630 U	630 U	--	--	--
T4S1MW01s	T4S1MW01s-GW-1	2/3/2005	250 U	630 U	630 U	--	--	--
T4S1MW01s	T4S1MW01s-GW-1	5/4/2005	--	--	--	14 J	21 J	37 J
T4S1MW02s	T4S1MW02s-GW-1	4/20/2004	--	--	--	50 U	290 U	580 U
T4S1MW02s	T4S1MW02s-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW02s	T4S1MW02s-GW-1	2/2/2005	--	--	--	250 U	20 J	43 J
T4S1MW02s	T4S1MW02s-GW-1	5/5/2005	--	--	--	250 U	250 U	250 U
T4S1MW03s	T4S1MW03s-GW-1	4/21/2004	--	--	--	50 U	300 U	590 U
T4S1MW03s	T4S1MW03s-GW-1	8/30/2004	--	--	--	17 J	240 U	480 U
T4S1MW03s	T4S1MW03s-GW-1	1/31/2005	--	--	--	19 J	28 J	41 J
T4S1MW03s	T4S1MW03s-GW-1	5/5/2005	--	--	--	250 U	250 U	500 U
T4S1MW07	T4S1MW07-GW-1	4/20/2004	--	--	--	50 U	290 U	580 U
T4S1MW07	T4S1MW07-GW-1	8/27/2004	240 U	600 U	600 U	--	--	--
T4S1MW07	T4S1MW07-GW-1	2/2/2005	250 U	630 U	630 U	--	--	--
T4S1MW07	T4S1MW07-GW-1	5/4/2005	250 U	630 U	630 U	250 U	250 U	32 J
T4S1MW08	T4S1MW08-GW-1	4/21/2004	--	--	--	50 U	310 U	610 U
T4S1MW08	T4S1MW08-GW-1	8/30/2004	240 U	600 U	600 U	--	--	--
T4S1MW08	T4S1MW08-GW-1	2/3/2005	250 U	630 U	630 U	--	--	--
T4S1MW08	T4S1MW08-GW-1	5/4/2005	--	--	--	250 U	250 U	500 U
T4S1MW17	T4S1MW17-GW-1	4/20/2004	--	--	--	50 U	260 U	520 U
T4S1MW17	T4S1MW17-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW17	T4S1MW17-GW-1	2/1/2005	--	--	--	250 U	25 J	45 J
T4S1MW17	T4S1MW17-GW-1	5/4/2005	--	--	--	250 U	250 U	37 J
T4S1MW18	T4S1MW18-GW-1	4/21/2004	--	--	--	50 U	300 U	590 U
T4S1MW18	T4S1MW18-GW-1	9/1/2004	--	--	--	250 U	250 U	500 U
T4S1MW18	T4S1MW18-GW-1	2/1/2005	--	--	--	250 U	26 J	51 J
T4S1MW18	T4S1MW18-GW-1	5/6/2005	--	--	--	250 U	250 U	500 U
T4S1MW19	T4S1MW19-GW-1	9/15/2004	--	--	--	14 J	64 J	480 U
T4S1MW19	T4S1MW19-GW-1	2/1/2005	--	--	--	250 U	62 J	500 U
T4S1MW19	T4S1MW19-GW-1	5/9/2005	--	--	--	26 J	250 U	500 U
T4S1MW22	T4S1MW22-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW22	T4S1MW22-GW-1	2/4/2005	--	--	--	250 U	62 J	170 J
T4S1MW22	T4S1MW22-GW-1	5/6/2005	--	--	--	19 J	250 U	500 U
T4S1MW23	T4S1MW23-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW23	T4S1MW23-GW-1	2/4/2005	--	--	--	250 U	65 J	190 J
T4S1MW23	T4S1MW23-GW-1	5/6/2005	--	--	--	250 U	250 U	500 U
T4S1MW24	T4S1MW24-GW-1	9/1/2004	--	--	--	250 U	250 U	500 U
T4S1MW24	T4S1MW24-GW-1	2/3/2005	--	--	--	250 U	30 J	46 J
T4S1MW24	T4S1MW24-GW-1	5/6/2005	--	--	--	14 J	250 U	500 U

- Notes:
1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 13B
GROUNDWATER CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			HCID (µg/L)			TPH (µg/L)		
Sample Location:	Sample ID:	Date Sampled:	Gasoline Range	Diesel Range	Residual Range	Gasoline Range	Diesel Range	Residual Range
T4S1MW04s	T4S1MW04s-GW-1	4/19/2004	--	--	--	50 U	270 U	530 U
T4S1MW04s	T4S1MW04s-GW-1	8/31/2004	--	--	--	250 U	240 U	480 U
T4S1MW04s	T4S1MW04s-GW-1	2/8/2005	--	--	--	250 U	250 U	47 J
T4S1MW04s	T4S1MW04s-GW-1	5/9/2005	--	--	--	250 U	250 U	500 U
T4S1MW09	T4S1MW09-GW-1	4/20/2004	--	--	--	50 U	260 U	520
T4S1MW09	T4S1MW09-GW-1	9/1/2004	--	--	--	250 U	250 U	500 U
T4S1MW09	T4S1MW09-GW-1	2/9/2005	--	--	--	250 U	250 U	35 J
T4S1MW09	T4S1MW09-GW-1	5/9/2005	--	--	--	250 U	250 U	500 U
T4S1MW10	T4S1MW10-GW-1	4/19/2004	--	--	--	50 U	270 U	530 U
T4S1MW10	T4S1MW10-GW-1	9/1/2004	--	--	--	250 U	250 U	500 U
T4S1MW10	T4S1MW10-GW-1	2/4/2005	--	--	--	13 J	250 U	500 U
T4S1MW10	T4S1MW10-GW-1	5/9/2005	--	--	--	250 U	250 U	500 U
T4S1MW11	T4S1MW11-GW-1	4/19/2004	--	--	--	50 U	290 U	570 U
T4S1MW11	T4S1MW11-GW-1	9/1/2004	250 U	630 U	630 U	--	--	--
T4S1MW11	T4S1MW11-GW-1	2/8/2005	--	--	--	250 U	29 J	56 J
T4S1MW11	T4S1MW11-GW-1	5/10/2005	260 U	650 U	650 U	250 U	260 U	520 U
T4S1MW12	T4S1MW12-GW-1	4/19/2004	--	--	--	50 U	330 U	650 U
T4S1MW13	T4S1MW13-GW-1	4/16/2004	--	--	--	50 U	250 U	500 U
T4S1MW14	T4S1MW14-GW-1	4/16/2004	--	--	--	50 U	320 U	500 U
T4S1MW14	T4S1MW14-GW-1	8/31/2004	--	--	--	250 U	120 U	240 U
T4S1MW14	T4S1MW14-GW-1	2/8/2005	--	--	--	250 U	250 U	500 U
T4S1MW14	T4S1MW14-GW-1	5/10/2005	--	--	--	250 U	260 U	520 U
T4S1MW15	T4S1MW15-GW-1	4/16/2004	--	--	--	50 U	250 U	500 U
T4S1MW15	T4S1MW15-GW-1	2/9/2005	250 U	630 U	630 U	--	--	--
T4S1MW15	T4S1MW15-GW-1	5/4/2005	250 U	630 U	630 U	14 J	21 J	37 J
T4S1MW16	T4S1MW16-GW-1	4/19/2004	--	--	--	50 U	320 U	630 U
T4S1MW16	T4S1MW16-GW-1	8/27/2004	--	--	--	250 U	250 U	500 U
T4S1MW16	T4S1MW16-GW-1	2/10/2005	--	--	--	250 U	250 U	43 J
T4S1MW18	T4S1MW18-GW-1	2/1/2005	--	--	--	13 U	26 J	51 J
T4S1MW20	T4S1MW20-GW-1	9/2/2004	--	--	--	18 J	250 U	500 U
T4S1MW20	T4S1MW20-GW-1	2/10/2005	--	--	--	250 U	40 J	85 J
T4S1MW20	T4S1MW20-GW-1	5/11/2005	--	--	--	250 U	250 U	500 U
T4S1MW21	T4S1MW21-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW21	T4S1MW21-GW-1	2/10/2005	--	--	--	250 U	24 J	89 J
T4S1MW21	T4S1MW21-GW-1	5/11/2005	--	--	--	250 U	250 U	500 U
T4S1MW23	T4S1MW23-GW-1	9/2/2004	--	--	--	250 U	250 U	500 U
T4S1MW23	T4S1MW23-GW-1	2/4/2005	--	--	--	15 J	65 J	190 J
T4S1MW24	T4S1MW24-GW-1	9/1/2004	--	--	--	250 U	250 U	500 U
T4S1MW24	T4S1MW24-GW-1	2/3/2005	--	--	--	13 J	30 J	46 J

- Notes:
1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 14A
GROUNDWATER CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			PAHs (µg/L)																		
Sample Location:	Sample ID:	Date Sampled:	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Dibenzofuran	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benz(b)fluoranthene	Benz(k)fluoranthene	Benz(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benz(g,h,i)perylene
T4S1MW01s	T4S1MW01s-GW-1	4/21/2004	0.0078 J	--	--	0.025 U	0.025 U	--	0.025 U	0.0036 J	0.0078 J	0.0041 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
T4S1MW01s	T4S1MW01s-GW-1	9/1/2004	0.033	--	0.016 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0098 J	0.020 U	0.0043 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW01s	T4S1MW01s-GW-1	2/3/2005	0.0087 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0060 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW01s	T4S1MW01s-GW-1	5/4/2005	0.0075 J	0.020 U	0.0029 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0044 J	0.0045 J	0.0052 J	0.0054 J	0.0022 J	0.0028 J	0.0026 J	0.0018 J	0.0018 J	0.020 U	0.020 U	0.020 U
T4S1MW02s	T4S1MW02s-GW-1	4/20/2004	0.011 J	--	--	0.0028 J	0.0033 J	--	0.0054 J	0.015 J	0.010 J	0.011 J	0.010 J	0.0073 J	0.0062 J	0.0043 J	0.0043 J	0.0032 J	0.0024 J	0.023 U	0.023 U
T4S1MW02s	T4S1MW02s-GW-1	9/2/2004	0.021	--	0.0067 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0058 J	0.002 J	0.0038 J	0.0052 J	0.020 U	0.020 U	0.0018 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW02s	T4S1MW02s-GW-1	2/2/2005	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U
T4S1MW02s	T4S1MW02s-GW-1	5/5/2005	0.029 U	0.02 U	0.011 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0075 J	0.0043 J	0.0058 J	0.005 J	0.020 U	0.0014 J	0.020 U	0.020 U	0.020 U	0.020 U, J	0.020 U, J	0.020 U
T4S1MW03s	T4S1MW03s-GW-1	4/21/2004	0.0058 J	--	--	0.0022 J	0.025 U	--	0.0044 J	0.014 J	0.056	0.01 J	0.0082 J	0.0038 J	0.0042 J	0.0035 J	0.025 U	0.0023 J	0.0023 J	0.025 U	0.025 U
T4S1MW03s	T4S1MW03s-GW-1	8/30/2004	0.020	--	0.0072 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.051	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW03s	T4S1MW03s-GW-1	1/31/2005	2.0 U	--	0.012 U	0.011 U	0.0088 U	0.014 U	0.012 U	0.023 J	0.090 J	0.013 U	0.015 U	0.012 U	0.014 U	0.020 U	0.020 U	0.016 U	0.024 U	0.031 U	0.020 U
T4S1MW03s	T4S1MW03s-GW-1	5/5/2005	0.02 U	0.02 U	0.0038 J	0.002 J	0.020 U	0.020 U	0.020 U	0.0038 J	0.076	0.0055 J	0.0042 J	0.0034 J	0.0028 J	0.0025 J	0.020 U	0.0022 J	0.020 U, J	0.020 U, J	0.020 U
T4S1MW07	T4S1MW07-GW-1	4/20/2004	0.0072 J	--	--	0.025 U	0.025 U	--	0.025 U	0.0089 J	0.021 J	0.0079 J	0.0065 J	0.0029 J	0.025 U	0.0027 J	0.025 U	0.0021 J	0.025 U	0.025 U	0.025 U
T4S1MW07	T4S1MW07-GW-1	8/27/2004	0.0087 J	--	0.02 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.014 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW07	T4S1MW07-GW-1	2/2/2005	2.0 U	--	0.012 U	0.011 U	0.0088 U	0.014 U	0.012 U	0.022 J	0.036 J	0.027 J	0.030 J	0.067 J	0.051 J	0.11 J	0.084 J	0.069 J	0.024 U	0.031 U	0.034 J
T4S1MW07	T4S1MW07-GW-1	5/4/2005	0.042	0.02 U	0.0084 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0036 J	0.014 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U, J	0.020 U, J	0.020 U
T4S1MW08	T4S1MW08-GW-1	4/21/2004	0.0082 J	--	--	0.024 U	0.0088 J	--	0.01 J	0.04	0.065	0.034	0.031	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
T4S1MW08	T4S1MW08-GW-1	8/30/2004	0.032	--	0.013 J	0.020 U	0.0057 J	0.020 U	0.0055 J	0.014 J	0.015 J	0.014 J	0.011 J	0.0026 J	0.0031 J	0.0022 J	0.0015 J	0.0016 J	0.020 U	0.0028 J	0.020 U
T4S1MW08	T4S1MW08-GW-1	2/3/2005	0.071	0.028	0.029	0.0042 J	0.020 U	0.020 U	0.020 U	0.0044 J	0.056	0.0060 J	0.0062 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW08	T4S1MW08-GW-1	5/4/2005	0.0048 J	0.2 U	0.023	0.0022 J	0.0041 J	0.020 U	0.0079 J	0.025	0.036	0.024	0.019 J	0.0051 J	0.0068 J	0.0036 J	0.0047 J	0.0033 J	0.0031 J	0.020 U, J	0.020 U
T4S1MW15	T4S1MW15-GW-1	5/4/2005	0.02 U	0.020 U	0.0029 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0044 J	0.0045 J	0.0052 J	0.0054 J	0.0022 J	0.0028 J	0.0026 J	0.0018 J	0.0018 J	0.020 U, J	0.020 U, J	0.020 U
T4S1MW17	T4S1MW17-GW-1	4/20/2004	0.0046 J	--	--	0.023 U	0.023 U	--	0.023 U	0.023 U	0.0056 J	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U
T4S1MW17	T4S1MW17-GW-1	9/2/2004	0.017 J	--	0.0046 J	0.0019 J	0.020 U	0.020 U	0.020 U	0.020 U	0.014 J	0.020 U	0.020 U	0.020 U	0.0013 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW17	T4S1MW17-GW-1	2/1/2005	2.0 U	--	0.012 U	0.011 U	0.0088 U	0.014 U	0.012 U	0.020 J	0.016 J	0.027 J	0.022 J	0.012 U	0.014 U	0.020 U	0.020 U	0.016 U	0.024 U	0.031 U	0.020 U
T4S1MW17	T4S1MW17-GW-1	5/4/2005	0.02 U	0.0036 J	0.02 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.013 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U, J	0.020 U, J	0.020 U
T4S1MW18	T4S1MW18-GW-1	4/21/2004	0.0080 J	--	--	0.025 U	0.025 U	--	0.025 U	0.0071 J	0.011 J	0.006 J	0.005 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
T4S1MW18	T4S1MW18-GW-1	9/1/2004	0.026	--	0.0083 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0036 J	0.0034 J	0.020 U	0.0028 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW18	T4S1MW18-GW-1	2/1/2005	2.0 U	--	0.012 U	0.011 U	0.0088 U	0.014 U	0.012 U	0.026 J	0.020 J	0.034 J	0.015 U	0.012 U	0.014 U	0.020 U	0.020 U	0.016 U	0.024 U	0.031 U	0.019 U
T4S1MW18	T4S1MW18-GW-1	5/6/2005	0.020 U	0.0050 J	0.0040 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0053 J	0.0078 J	0.0056 J	0.0042 J	0.0029 J	0.0022 J	0.0023 J	0.0017 J	0.0021 J	0.0025 J	0.0022 J	0.020 U
T4S1MW19	T4S1MW19-GW-1	9/15/2004	0.018 J	--	0.017 J	0.020 U	0.0043 J	0.020 U	0.0061 J	0.01 J	0.015 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW19	T4S1MW19-GW-1	2/9/2005	0.065	0.015 J	0.020 J	0.0047 J	0.020 U	0.020 U	0.0058 J	0.012 J	0.014 J	0.0068 J	0.0092 J	0.0041 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW19	T4S1MW19-GW-1	5/9/2005	0.027	0.0090 J	0.0062 J	0.020 U	0.0020 J	0.020 U	0.0035 J	0.011 J	0.0065 J	0.011 J	0.010 J	0.0033 J	0.0050 J	0.0039 J	0.0040 J	0.0044 J	0.0035 J	0.020 U, J	0.020 U
T4S1MW22	T4S1MW22-GW-1	9/2/2004	0.015 J	--	0.0057 J	0.0034 J	0.020 U	0.020 U	0.020 U	0.011 J	0.012 J	0.0079 J	0.006 J	0.020 U	0.0022 J	0.0022 J	0.002 J	0.0018 J	0.0026 J	0.0018 J	0.020 U
T4S1MW22	T4S1MW22-GW-1	2/4/2005	0.051	0.0081 J	0.013 J	0.0034 J	0.020 U	0.020 U	0.020 U	0.0048 J	0.021	0.020 U	0.0042 J	0.0045 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW22	T4S1MW22-GW-1	5/6/2005	0.11 J	0.033	0.025	0.0029 J	0.0027 J	0.020 U	0.0041 J	0.0043 J	0.0096 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U, J	0.020 U, J	0.020 U
T4S1MW23	T4S1MW23-GW-1	9/2/2004	0.012 J	--	0.0053 J	0.002 J	0.019 U	0.019 U	0.0035 J	0.023	0.014 J	0.016 J	0.014 J	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
T4S1MW23	T4S1MW23-GW-1	2/4/2005	0.045	0.0067 J	0.010 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0041 J	0.032	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW23	T4S1MW23-GW-1	5/6/2005	0.020 U	0.0037 J	0.0039 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0048 J	0.023	0.0065 J	0.0053 J	0.020 U	0.0024 J	0.0022 J	0.0017 J	0.0020 J	0.020 U, J	0.020 U, J	0.020 U
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.041	--	0.018 J	0.020 U	0.020 U	0.020 U	0.003 J	0.008 J	0.0051 J	0.0072 J	0.0058 J	0.02 U	0.0027 J	0.0026 J	0.0017 J	0.0018 J	0.020 U	0.020 U	0.020 U
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.29 U	--	0.012 U	0.011 U	0.0088 U	0.014 U	0.012 U	0.044 J	0.043 J	0.049 J	0.056 J	0.036 J	0.038 J	0.14 J	0.13 J	0.14 J	0.057 J	0.042 J	0.062 J
T4S1MW24	T4S1MW24-GW-1	5/6/2005	0.020 U	0.0086 J	0.0058 J	0.020 U	0.020 U	0.020 U	0.0026 J	0.0054 J	0.013 J	0.0062 J	0.0048 J	0.0025 J	0.0027 J	0.0032 J	0.0023 J	0.0025 J	0.0027 J	0.020 U, J	0.020 U
T4S1MW26	T4S1MW26-GW-1	9/16/2005	0.100 U	--	--	0.100 U	0.100 U	--	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U

- Notes:
1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 14B
GROUNDWATER CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			PAHs (µg/L)																		
Sample Location:	Sample ID:	Date Sampled:	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Dibenzofuran	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
T4S1MW04s	T4S1MW04s-GW-1	4/19/2004	0.0083 J	--	0.025 U	0.025 U	0.025 U	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
T4S1MW04s	T4S1MW04s-GW-1	8/31/2004	0.019 J	--	0.008 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW04s	T4S1MW04s-GW-1	2/8/2005	0.0082 J	--	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
T4S1MW04s	T4S1MW04s-GW-1	5/9/2005	0.017 J	0.0085 J	0.013 J	0.0019 J	0.0020 U	0.0071 U	0.0031 J	0.0061 J	0.0019 J	0.014 J	0.014 J	0.0076 J	0.0086 J	0.0060 J	0.0065 J	0.0048 J	0.0043 J	0.0017 U, J	0.0040 J
T4S1MW09	T4S1MW09-GW-1	4/20/2004	0.0087 J	--	--	0.0026 J	0.0028 J	--	0.004 J	0.0075 J	0.05	0.0081 J	0.0078 J	0.0062 J	0.0045 J	0.0043 J	0.0045 J	0.003 J	0.0025 J	0.022 U	0.0036 J
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.022	--	0.013 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.03	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW09	T4S1MW09-GW-1	2/9/2005	0.0080 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0043 J	0.043	0.020 U	0.0042 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.033	0.0076 J	0.012 J	0.0022 J	0.0020 U	0.0071 U	0.0026 U	0.0081 J	0.025	0.018 J	0.017 J	0.010 J	0.013 J	0.011 J	0.010 J	0.011 J	0.0090 J	0.0017 U, J	0.0094 J
T4S1MW10	T4S1MW10-GW-1	4/19/2004	0.011 J	--	--	0.0019 J	0.027 U	--	0.027 U	0.0047 J	0.087	0.0064 J	0.0050 J	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.025	--	0.014 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.094	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW10	T4S1MW10-GW-1	2/4/2005	0.0014 J	0.0039 J	0.0057 J	0.0062 J	0.020 U	0.020 U	0.020 U	0.020 U	0.076	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.037	0.0090 J	0.014 J	0.0022 J	0.0020 U	0.0071 U	0.0026 U	0.0032 U	0.070	0.0024 U	0.0023 U	0.0021 U	0.0013 U	0.0020 U	0.0014 U	0.0016 U	0.0021 U, J	0.0017 U, J	0.020 U
T4S1MW11	T4S1MW11-GW-1	4/19/2004	0.0068 J	--	--	0.0018 J	0.025 U	--	0.0037 J	0.028	0.027	0.024 J	0.025 J	0.0038 J	0.0041 J	0.025 U	0.025 U	0.0019 J	0.025 U	0.025 U	0.025 U
T4S1MW11	T4S1MW11-GW-1	9/1/2004	0.043	--	0.024	0.0034 J	0.020 U	0.020 U	0.020 U	0.013 J	0.032	0.020	0.028	0.013 J	0.012 J	0.005 J	0.0071 J	0.0089 J	0.0043 J	0.020 U	0.020 U
T4S1MW11	T4S1MW11-GW-1	2/8/2005	0.012 J	--	0.0073 J	0.019 U	0.019 U	0.019 U	0.019 U	0.0059 J	0.015 J	0.019 U	0.0056 J	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
T4S1MW11	T4S1MW11-GW-1	5/10/2005	0.02 U	0.020 U	0.0030 J	0.0026 J	0.020 U	0.020 U	0.020 U	0.0094 J	0.025	0.016 J	0.023	0.011 J	0.0098 J	0.0053 J	0.0064 J	0.0070 J	0.0062 J	0.0023 J	0.0050 J
T4S1MW12	T4S1MW12-GW-1	4/19/2004	0.0063 J	--	--	0.025 U	0.025 U	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
T4S1MW13	T4S1MW13-GW-1	4/16/2004	0.011 J	0.022 U	0.022 U	0.022 U	0.022 U	--	0.022 U	0.020 J	0.025	0.014 J	0.025	0.0037 J	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.0030 J	0.0044 J
T4S1MW13	T4S1MW13-GW-1	8/31/2004	0.029	--	0.017 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0048 J	0.018 J	0.006 J	0.0097 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW14	T4S1MW14-GW-1	4/16/2004	0.0067 J	0.023 U	0.023 U	0.023 U	0.023 U	--	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.0032 J	0.0034 J
T4S1MW14	T4S1MW14-GW-1	8/31/2004	0.035	--	0.024	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0049 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW14	T4S1MW14-GW-1	2/8/2005	0.0099 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.013 J	0.019 J	0.0058 J	0.0078 J	0.0046 J	0.020 U	0.0048 J	0.020 U	0.0084 J	0.0043 J	0.020 U	0.0043 J
T4S1MW14	T4S1MW14-GW-1	5/10/2005	0.02 U	0.020 U	0.0028 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0042 J	0.0036 J	0.0061 J	0.0055 J	0.0024 J	0.0031 J	0.0030 J	0.0029 J	0.0033 J	0.0041 J	0.020 U	0.020 U
T4S1MW15	T4S1MW15-GW-1	4/16/2004	0.0089 J	0.0056 J	0.020 U	0.020 U	0.0052 J	--	0.020 U	0.0075 J	0.028	0.0085 J	0.022	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW15	T4S1MW15-GW-1	2/3/2005	0.0087 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0060 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW16	T4S1MW16-GW-1	4/19/2004	0.010 J	--	--	0.0045 J	0.0066 J	--	0.0098 J	0.018 J	0.024 J	0.023 J	0.021 J	0.012 J	0.010 J	0.0087 J	0.0084 J	0.0069 J	0.0062 J	0.0058 J	0.0091 J
T4S1MW16	T4S1MW16-GW-1	8/27/2004	0.012 J	--	0.0044 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0042 J	0.027	0.0076 J	0.008 J	0.0048 J	0.0044 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW16	T4S1MW16-GW-1	2/10/2005	0.056	0.011 J	0.016 J	0.0037 J	0.020 U	0.020 U	0.020 U	0.0067 J	0.027	0.0071 J	0.0081 J	0.0049 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW16	T4S1MW16-GW-1	5/10/2005	0.0062	0.011 J	0.015 J	0.0052 J	0.0096 J	0.020 U	0.0086 J	0.079	0.027	0.015	0.13	0.075	0.11	0.096	0.087	0.095	0.094 J	0.019 J	0.079
T4S1MW20	T4S1MW20-GW-1	9/2/2004	0.14	--	0.015 J	0.0099 J	0.018 J	0.020 U	0.018 J	0.075	0.022	0.023	0.024	0.0074 J	0.0076 J	0.0045 J	0.0043 J	0.0059 J	0.0034 J	0.020 U	0.020 U
T4S1MW20	T4S1MW20-GW-1	2/10/2005	0.074	0.024	0.024	0.020 U	0.020 U	0.020 U	0.0072 J	0.015 J	0.031	0.012 J	0.016 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW20	T4S1MW20-GW-1	5/11/2005	0.025	0.0029 J	0.0040 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0071 J	0.020	0.017 J	0.016 J	0.0092 J	0.010 J	0.010 J	0.0062 J	0.0088 J	0.0086 J	0.0022 J	0.0076 J
T4S1MW21	T4S1MW21-GW-1	9/2/2004	0.015 J	--	0.0058 J	0.0022 J	0.0056 J	0.020 U	0.0046 J	0.021	0.011 J	0.013 J	0.012 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW21	T4S1MW21-GW-1	2/10/2005	0.072	0.026	0.027	0.0038 J	0.0058 J	0.0050 J	0.0075 J	0.0098 J	0.027	0.0066 J	0.0089 J	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
T4S1MW21	T4S1MW21-GW-1	5/11/2005	0.0088 J	0.020 U	0.0027 J	0.020 U	0.020 U	0.020 U	0.020 U	0.0044 J	0.026	0.020	0.018 J	0.020 U	0.0019 J	0.020 U	0.020 U	0.020 U	0.020 U, J	0.020 U, J	0.020 U
T4S1MW25	T4S1MW25-GW-1	11/9/2005	0.476 U	--	--	0.476 U	0.476 U		0.244 J, D	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.0952 U	0.190 U	0.0952 U

- Notes:
1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 15
GROUNDWATER CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS - (EXCEPT PAHs)

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			SVOCs (µg/L)								
Sample Location:	Sample ID:	Date Sampled:	Phenol	4-Methyl phenol	Isophorone	4-Chloro aniline	4-Chloro-3-methylphenol	Dimethyl Phthalate	Diethyl Phthalate	Di-n-butyl Phthalate	Bis(2-ethylhexyl) Phthalate
T4S1MW03S	T4S1MW03S-GW-1	1/31/2005	0.50 U	0.50 U	0.20 U	0.20 U	0.50 U	0.20 U	0.10 J	0.19 J	2.0 U
T4S1MW07	T4S1MW07-GW-1	8/27/2004	0.099 J	0.088 J	0.2 U	0.025 J	0.037 J	0.2 U	0.034 J	0.041 J	2.0 U
T4S1MW07	T4S1MW07-GW-1	2/2/2005	0.48 U	0.48 U	0.20 U	0.20 U	0.48 U	0.20 U	0.2 U	0.2 U	2.0 U
T4S1MW07	T4S1MW07-GW-1	5/4/2005	-- R	-- R	-- R	-- R	-- R	-- R	0.046 J	0.19 U	-- R
T4S1MW17	T4S1MW17-GW-1	2/1/2005	0.48 U	0.48 U	0.20 U	0.20 U	0.068 J	0.20 U	0.089 J	0.11 J	2.0 U
T4S1MW18	T4S1MW18-GW-1	2/1/2005	0.48 U	0.48 U	0.19 U	0.19 U	0.065 J	0.19 U	0.13 J	0.11 J	0.27 J
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.82 J	1.2 J	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.49 U	0.49 U	0.20 U	0.20 U	0.49 U	0.20 U	0.2 U	0.2 U	0.35 J
T4S1MW24	T4S1MW24-GW-1	5/6/2005	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U

- Notes:
1. Only detected compounds are reported in the table. The complete analyte list is presented in the Sampling and Analysis Plan (Appendix A) of the RI Work Plan (Hart Crowser, 2004a).
 2. SVOCs = Semivolatile Organic Compounds by EPA Method 8270C.
 3. µg/L = Micrograms per liter.
 4. -- = Not analyzed or data rejected (R) as part of data quality review.
 5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 7. R = Rejected.

TABLE 16A
GROUNDWATER CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	Sample ID:	Date Sampled:	VOCs (µg/L)																									
			Vinyl Chloride	Acetone	1,1-Dichloroethene (1,1-DCE)	Carbon Disulfide	trans-1,2-Dichloroethene	1,1-Dichloroethane (1,1-DCA)	2-Butanone (MEK)	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane (TCA)	Benzene	Trichloroethene (TCE)	Toluene	Tetrachloroethene (PCE)	Chlorobenzene	Ethylbenzene	m,p-Xylenes	o-Xylene	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	n-Butylbenzene	Naphthalene
T4S1MW01s	T4S1MW01s-GW-1	4/21/2004	0.50 U	20 U	0.50 U	0.27 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.10 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW02s	T4S1MW02s-GW-1	4/20/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW02s	T4S1MW02s-GW-1	9/2/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW02s	T4S1MW02s-GW-1	2/2/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.92	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW02s	T4S1MW02s-GW-1	5/5/2005	0.50 U	17 J	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U, J	2.0 U	0.50 U	0.50 U	2.0 U, J	2.0 U
T4S1MW03s	T4S1MW03s-GW-1	4/21/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	2.3	0.23 J	0.50 U	0.50 U	0.29 J	0.23 J	0.77	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW03s	T4S1MW03s-GW-1	8/30/2004	5.4	20 U	0.37 J	0.5 U	0.78	0.50 U	20 U	89	0.50 U	0.50 U	0.50 U	1.3	0.50 U	1.8	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW03s	T4S1MW03s-GW-1	1/31/2005	1.3	20 U	0.5 U	0.5 U	0.5 U	0.5 U	20 U	15	0.19 J	0.5 U	0.5 U	3.5	0.48 J	14	0.5 U	0.5 U	0.5 U	0.5 U	2.0 U	2.0 U	2.0	2.0 U	0.5 U	0.5 U	2.0	2.0 U
T4S1MW03s	T4S1MW03s-GW-1	5/5/2005	0.50 U	20 U	0.50 U	0.50 U	0.20 J	0.50 U	20 U	7.6	0.48 J	0.50 U	0.50 U	0.42 J	0.12 J	1.9	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U, J	2.0 U	0.50 U	0.50 U	2.0 U, J	2.0 U
T4S1MW07	T4S1MW07-GW-1	4/20/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW07	T4S1MW07-GW-1	8/27/2004	0.50 U	20 U	0.50 U	0.94	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW07	T4S1MW07-GW-1	2/2/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW07	T4S1MW07-GW-1	5/4/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U, J	2.0 U	0.50 U	0.50 U	2.0 U, J	2.0 U
T4S1MW08	T4S1MW08-GW-1	4/21/2004	0.50 U	20 U	0.50 U	0.20 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW08	T4S1MW08-GW-1	8/30/2004	0.50 U	20 U	0.50 U	0.72	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW08	T4S1MW08-GW-1	2/3/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW08	T4S1MW08-GW-1	5/4/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.11 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U, J	2.0 U	0.50 U	0.50 U	2.0 U, J	2.0 U
T4S1MW17	T4S1MW17-GW-1	4/20/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.36 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW17	T4S1MW17-GW-1	9/2/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW17	T4S1MW17-GW-1	2/1/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.3	0.21 J	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW17	T4S1MW17-GW-1	5/4/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U, J	2.0 U	0.50 U	0.12 J	2.0 U, J	2.0 U
T4S1MW18	T4S1MW18-GW-1	4/21/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.10 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW18	T4S1MW18-GW-1	9/1/2004	0.5 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW18	T4S1MW18-GW-1	2/1/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.3	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW18	T4S1MW18-GW-1	5/6/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.14 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW19	T4S1MW19-GW-1	9/15/2004	0.5 U	20 U	0.50 U	0.50 U	0.5 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW19	T4S1MW19-GW-1	2/9/2005	0.50 U, J	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW19	T4S1MW19-GW-1	5/9/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U, J	2.0 U
T4S1MW22	T4S1MW22-GW-1	9/2/2004	0.23 J	20 U	0.40 J	0.50 U	0.59	0.50 U	20 U	23	0.50 U	0.50 U	0.50 U	36	0.50 U	12	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW22	T4S1MW22-GW-1	2/4/2005	0.97	20 U	0.63	0.50 U	0.88	0.50 U	20 U	36	0.50 U	0.50 U	0.50 U	64	0.50 U	27	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW22	T4S1MW22-GW-1	5/6/2005	0.88	20 U	1.1	0.50 U	1.2	0.50 U	20 U	49	0.50 U	0.50 U	0.50 U	83 D	0.11 J	34	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW23	T4S1MW23-GW-1	9/2/2004	0.48 J	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	16	0.50 U	0.50 U	0.50 U	6.2	0.50 U	8	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW23	T4S1MW23-GW-1	2/4/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.86	0.50 U	0.50 U	0.50 U	1.2	0.16 J	5.3	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.21 J	0.50 U	2.0 U	2.0 U, J
T4S1MW23	T4S1MW23-GW-1	5/6/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	4.1	0.50 U	0.50 U	0.50 U	2.2	0.50 U	7.8	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.5 U	20 U	0.5 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.61	0.50 U	0.50 U	0.50 U	0.50 U	0.25 J	0.12 J	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U, J
T4S1MW24	T4S1MW24-GW-1	5/6/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.																

- Notes:
- VOCs = Volatile Organic Compounds by EPA Method 8260B.
 - µg/L = Micrograms per liter.
 - = Not analyzed.
 - J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 - U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 16B
GROUNDWATER CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	Sample ID:	Date Sampled:	VOCs (µg/L)																									
			Vinyl Chloride	Acetone	1,1-Dichloroethene (1,1-DCE)	Carbon Disulfide	trans-1,2-Dichloroethene	1,1-Dichloroethane (1,1-DCA)	2-Butanone (MEK)	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane (TCA)	Benzene	Trichloroethene (TCE)	Toluene	Tetrachloroethene (PCE)	Chlorobenzene	Ethylbenzene	m,p-Xylenes	o-Xylene	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	n-Butylbenzene	Naphthalene
T4S1MW04s	T4S1MW04s-GW-1	4/19/2004	0.50 U	20 U	0.50 U	0.41	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.26 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW04s	T4S1MW04s-GW-1	8/31/2004	0.50 U	20 U	0.50 U	0.38 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW04s	T4S1MW04s-GW-1	2/8/2005	0.50 U	20 U	0.50 U	0.17 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.35 J	0.50 U	0.50 U	0.50 U	0.27 J	0.12 J	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW04s	T4S1MW04s-GW-1	5/9/2005	0.22 U	4.1 U	0.13 U	0.41 J	0.15 U	0.11 U	2.0 U	0.12 U	0.14 U	0.12 U	0.14 U	0.14 U	0.36 J	0.13 U	0.14 U	0.29 J	1.5	0.76	0.11 U	0.34 J	3.1	0.13 U	0.11 U	0.12 U	0.23 U, J	1.6 J
T4S1MW09	T4S1MW09-GW-1	4/20/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.15	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW09	T4S1MW09-GW-1	2/9/2005	0.50 U, J	20 U	0.50 U, J	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.22 U	4.1 U	0.13 U	0.16 U	0.15 U	0.11 U	2.0 U	0.12 U	0.14 U	0.12 U	0.14 U	0.14 U	0.26 J	0.13 U	0.14 U	0.13 U	0.22 U	0.11 U	0.11 U	0.098 U	0.15 U, J	0.13 U	0.11 U	0.12 U	0.23 U, J	0.29 U
T4S1MW10	T4S1MW10-GW-1	4/19/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.10 J	20 U	0.19 J	0.50 U	0.50 U	0.50 U	0.19 J	0.22 J	0.24	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.18 J	20 U	0.13 J	0.50 U	0.50 U	0.50 U	0.21 J	0.50 U	0.33 J	0.50 U	0.5 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.5 U	2 U	2 U
T4S1MW10	T4S1MW10-GW-1	2/4/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.19 J	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 J	0.50 U	0.51	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.22 U	4.1 U	0.13 U	0.16 U	0.15 U	0.17 J	2.0 U	0.14 J	0.14 U	0.12 U	0.14 U	0.24 J	0.37 J	0.41 J	0.14 U	0.13 U	0.36 J	0.17 J	0.11 U	0.098 U	0.15 U, J	0.13 U	0.11 U	0.12 U	0.23 U, J	0.29 U
T4S1MW11	T4S1MW11-GW-1	4/19/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.20 J	0.39 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW11	T4S1MW11-GW-1	9/1/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW11	T4S1MW11-GW-1	2/8/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 J	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW11	T4S1MW11-GW-1	5/10/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW12	T4S1MW12-GW-1	4/19/2004	0.50 U	20 U	0.50 U	0.21 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW13	T4S1MW13-GW-1	4/16/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW14	T4S1MW14-GW-1	4/16/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.16 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW14	T4S1MW14-GW-1	8/31/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW14	T4S1MW14-GW-1	2/8/2005	0.50 U	20 U	0.50 U, J	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.11 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW14	T4S1MW14-GW-1	5/10/2005	0.50 U	20 U	0.50 U	0.19 J	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.31 J	0.50 U	0.50 U	0.50 U	0.34 J	0.14 J	2.0 U	2.0 U	0.20 J	2.0 U	0.50 U	0.12 J	2.0 U	2.0 U
T4S1MW15	T4S1MW15-GW-1	4/16/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW16	T4S1MW16-GW-1	4/19/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.90	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	1.4	0.50 U	2 U	2 U
T4S1MW16	T4S1MW16-GW-1	8/27/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.75	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW16	T4S1MW16-GW-1	2/10/2005	0.50 U, J	20 U	0.50 U, J	1.7	0.50 U	0.50 U	20 U	0.50 U	4.4	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW16	T4S1MW16-GW-1	5/10/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	3.1	0.50 U	0.50 U	0.50 U	0.50	0.50 U	0.50 U	0.50 U	0.36 J	0.15 J	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW20	T4S1MW20-GW-1	9/2/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW20	T4S1MW20-GW-1	2/10/2005	0.50 U, J	20 U	0.50 U, J	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.19 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW20	T4S1MW20-GW-1	5/11/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW21	T4S1MW21-GW-1	9/2/2004	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2 U	2 U	2 U	2 U	0.50 U	0.50 U	2 U	2 U
T4S1MW21	T4S1MW21-GW-1	2/10/2005	0.50 U, J	20 U	0.50 U, J	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U
T4S1MW21	T4S1MW21-GW-1	5/11/2005	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	20 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.15 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	0.50 U	0.50 U	2.0 U	2.0 U

- Notes:
1. VOCs = Volatile Organic Compounds by EPA Method 8260B.
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 17A
GROUNDWATER CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			PCBs (µg/L)							
Sample Location:	Sample ID:	Date Sampled:	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
T4S1MW01s	T4S1MW01s-GW-1	4/21/2004	0.31 U	0.62 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	--
T4S1MW01s	T4S1MW01s-GW-1	9/1/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW01s	T4S1MW01s-GW-1	2/3/2005	0.21 U	0.41 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	--
T4S1MW01s	T4S1MW01s-GW-1	5/4/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW08	T4S1MW08-GW-1	8/30/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW08	T4S1MW08-GW-1	2/3/2005	0.21 U	0.41 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	--
T4S1MW08	T4S1MW08-GW-1	5/5/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW15	T4S1MW15-GW-1	2/3/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW17	T4S1MW17-GW-1	4/20/2004	0.22 U	0.43 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	--
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW24	T4S1MW24-GW-1	5/6/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--

- Notes:
- 1. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
 - 2. µg/L = Micrograms per liter.
 - 3. -- = Not analyzed.
 - 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 17B
GROUNDWATER CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			PCBs (µg/L)							
Sample Location:	Sample ID:	Date Sampled:	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW09	T4S1MW09-GW-1	2/9/2005	0.19 U	0.38 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	--
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW10	T4S1MW10-GW-1	2/4/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--
T4S1MW16	T4S1MW16-GW-1	4/19/2004	0.31 U	0.62 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	--
T4S1MW16	T4S1MW16-GW-1	8/27/2004	0.2 U	0.39 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
T4S1MW16	T4S1MW16-GW-1	2/10/2005	0.20 U	0.39 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--

- Notes:
- 1. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
 - 2. µg/L = Micrograms per liter.
 - 3. -- = Not analyzed.
 - 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 18A
GROUNDWATER CHEMISTRY RESULTS: PESTICIDES - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			Pesticides (µg/L)																	
Sample Location:	Sample ID:	Date Sampled:	alpha-BHC	beta-BHC	gamma-BHC (Lindane)	delta-BHC	Heptachlor	Aldrin	Heptachlor Epoxide	Endosulfan I	alpha-Chlordane	Dieldrin	4,4'-DDE	Endrin	Endosulfan II	4,4'-DDD	Endrin Aldehyde	4,4'-DDT	Endrin Ketone	Methoxychlor
T4S1MW03s	T4S1MW03s-GW-1	04/21/2004	0.012 U	0.0035 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 Ui	0.012 U	0.012 U	0.0022 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
T4S1MW03s	T4S1MW03s-GW-1	8/30/2004	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.01 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0032 U	0.010 U	0.010 Ui	0.010 U	0.010 U
T4S1MW03s	T4S1MW03s-GW-1	1/31/2005	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
T4S1MW03s	T4S1MW03s-GW-1	5/5/2005	0.0096 U	0.0079 J	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 Ui	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
T4S1MW08	T4S1MW08-GW-1	04/21/2004	0.0023 J	0.0035 U	0.0015 J	0.0028 J	0.0028 JP	0.017 Ui	0.0032 JP	0.0016 J	0.012 U	0.012 U	0.0043 J+, P	0.0031 JP	0.012 U	0.012 Ui	0.012 U	0.012 Ui	0.012 Ui	0.0053 JP
T4S1MW08	T4S1MW08-GW-1	8/30/2004	0.0097 U	1.0 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
T4S1MW08	T4S1MW08-GW-1	2/3/2005	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
T4S1MW08	T4S1MW08-GW-1	5/4/2005	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 Ui	0.0097 U	0.0097 U	0.0097 U	0.0097 U
T4S1MW08	T4S1MW08-GW1	9/16/2005	0.0400 U	0.0400 U	0.0400 U	0.100 U	0.0800 U	0.0800 U	0.0400 U	0.0200 U	0.0400 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0400 U	0.160 U	0.0800 U	0.0800 U	0.500 U
T4S1MW17	T4S1MW17-GW-1	04/20/2004	0.011 U	0.0031 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.0023 J	0.011 U	0.011 U	0.011 U	0.011 U	0.0042 J	0.011 Ui
T4S1MW17	T4S1MW17-GW-1	5/4/2005	0.0049 U	0.0017 U	0.0022 U	0.0015 U	0.0039 U	0.0018 U	0.0012 U	0.00066 U	0.0013 U	0.0013 Ui	0.00069 U	0.0056 J	0.0019 U	0.00082 U	0.0037 J	0.0096 U	0.031	0.0015 U
T4S1MW17	T4S1MW17-GW-1	9/16/2005	0.0400 U	0.0400 U	0.0400 U	0.100 U	0.0800 U	0.0800 U	0.0400 U	0.0200 U	0.0400 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0400 U	0.160 U	0.0800 U	0.00762 J	0.500 U
T4S1MW18	T4S1MW18-GW-1	04/21/2004	0.012 U	0.0035 U	0.012 U	0.012 U	0.012 Ui	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
T4S1MW26	T4S1MW26-GW1	9/16/2005	0.0400 U	0.0400 U	0.0400 U	0.100 U	0.0800 U	0.0800 U	0.0400 U	0.0200 U	0.0400 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0400 U	0.160 U	0.0800 U	0.0800 U	0.500 U
	Preliminary Screening Levels	Fish Consumption SLV Aquatic SLV	0.0049 2.2	0.017 2.2	0.063 0.08	-- --	7.9E-05 0.0038 ^a	0.00005 0.06 ^a	0.000039 0.0038 ^a	89 0.056 ^a	0.00081 0.0043 ^a	5.4E-05 0.056 ^a	0.00022 --	0.81 0.036 ^a	89 0.056 ^a	0.00031 0.001	0.3 --	0.00022 0.001	-- --	-- 0.03

- Notes:
1. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed or data rejected (R) as part of data quality review.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 6. i = The MRL/MDL was raised due to a chromatographic interference.
 7. P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 25 percent between the two analytical results.
 8. J+ = The result is an estimated concentration that is is potentially biased high (compared to the confirmation result).
 9. R = Rejected.

TABLE 18B
GROUNDWATER CHEMISTRY RESULTS: PESTICIDES - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			Pesticides (µg/L)																	
Sample Location:	Sample ID:	Date Sampled:	alpha-BHC	beta-BHC	gamma-BHC (Lindane)	delta-BHC	Heptachlor	Aldrin	Heptachlor Epoxide	Endosulfan I	alpha- Chlordane	Dieldrin	4,4'-DDE	Endrin	Endosulfan II	4,4'-DDD	Endrin Aldehyde	4,4'-DDT	Endrin Ketone	Methoxychlor
T4S1MW09	T4S1MW09-GW-1	04/20/2004	0.012 U	0.0033 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.0028 U	0.012 U	0.012 U	0.012 U	0.0015	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U <i>i</i>	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
T4S1MW09	T4S1MW09-GW-1	2/3/2005	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U <i>i</i>	0.0095 U	0.0095 U <i>i</i>	0.0095 U <i>i</i>	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0030 J	--	0.0095 U
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
T4S1MW10	T4S1MW10-GW-1	04/19/2004	0.012 U	0.0035 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.0044 JP	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
T4S1MW10	T4S1MW10-GW-1	2/9/2005	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U <i>i</i>	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U <i>i</i>	0.0097 U	0.0097 U	0.0097 U	--	0.0097 U
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U <i>i</i>	0.0096 U <i>i</i>	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
T4S1MW11	T4S1MW11-GW-1	04/19/2004	0.013 U	0.0037 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U <i>i</i>	0.013 U	0.0026 J	0.013 U	0.013 U	0.013 U	0.013 U
T4S1MW11	T4S1MW11-GW-1	9/1/2004	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0012 J	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U <i>i</i>	0.0097 U	0.0014 JP	0.0097 U	0.0097 U
T4S1MW11	T4S1MW11-GW-1	5/10/2005	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U <i>i</i>	0.0096 U	0.0096 U	0.0096 U	0.0096 U

- Notes:
1. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed or data rejected (R) as part of data quality review.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 6. i = The MRL/MDL was raised due to a chromatographic interference.
 7. P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 25 percent between the two analytical results.

TABLE 19A
GROUNDWATER CHEMISTRY RESULTS: METALS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			Total Metals (µg/L)												
Sample Location:	Sample ID:	Date Sampled:	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
T4S1MW08	T4S1MW08-GW-1	5/4/2005	0.05 U	0.38 B	0.033	0.02 J	14.6	3.76 U	0.52 U	0.2 U	12.5	1.0 U	0.006 B	0.02	9.38
T4S1MW08	T4S1MW08-GW-1	9/16/2005	3.0 U	1.00 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.20 U	0.540 J	0.400 J	1.0 U	1.0 U	3.26 J
T4S1MW17	T4S1MW17-GW-1	5/4/2005	0.03 B	0.24 B	0.020 U	0.02	0.94	2.6 J	0.11	0.14 B	8	0.1 B	0.02 U	0.02 U	6.18
T4S1MW17	T4S1MW17-GW-1	9/16/2005	3.0 U	1.00 U	1.0 U	1.0 U	1.0 U	0.530 J	1.0 U	0.20 U	5.64	0.370 J	1.0 U	1.0 U	5.15 J
T4S1MW19	T4S1MW19-GW-1	9/15/2004	0.04 B,N	2.4	0.014 B	0.02	0.66	0.82	0.133	0.2 U	4.83	5 U	0.01 B	0.02 U	3.1
T4S1MW19	T4S1MW19-GW-1	2/9/2005	0.02 B	2.1	0.076	0.148	5.92	5.24	1.160	0.20 U, J	10.2	0.9 B	0.015 B	0.011 B	10.7
T4S1MW19	T4S1MW19-GW-1	5/9/2005	0.03 B	1.81	0.018 B	0.26	7.34	3.55	0.35	0.2 U	7.76	1 B	0.020 U	0.017 B	14.1
T4S1MW22	T4S1MW22-GW-1	9/2/2004	0.05 U	0.3 B	0.008 B	0.04	0.22	0.79	0.056	0.2 U	8.75	1 U	0.02 U	0.009 B	2.5
T4S1MW22	T4S1MW22-GW-1	2/4/2005	0.02 B	0.2 B	0.010 B	0.111	0.22	0.63 J	0.082	0.2 U	5.95	1.0 U	0.020 U	0.011 J	1.5
T4S1MW22	T4S1MW22-GW-1	5/6/2005	0.037 B	0.2 J	0.006 B	0.108	0.27 U	0.45 B	0.153	0.20 U	2.96 J	1.0 U	0.020 U	0.02 U	1.63 J
T4S1MW23	T4S1MW23-GW-1	9/2/2004	0.05 U	3.6	0.02 U	0.02 U	0.27	0.39	0.089	0.2 U	3.73	1 U	0.024	0.02 U	3.3
T4S1MW23	T4S1MW23-GW-1	2/4/2005	0.02 B	4.3	0.020 U	0.02 U	0.2 U	0.27 J	0.044	0.2 U	2.32	1.0 U	0.020 U	0.020 U, J	1.3
T4S1MW23	T4S1MW23-GW-1	5/6/2005	0.042 B	3.4 J	0.011 B	0.287	1.72	1.01	0.282	0.20 U	2.13 J	1.0 U	0.02 U	0.02 U	3.87 J
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.06	1.4	0.01 B	0.03	0.74	1.1	0.268	0.2 U	13.4	3 B	0.02 U	0.011 B	7.5
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.02 B	0.5 U	0.011 B	0.052	0.41	1.69 J	0.034	0.20 U	10.5	1.0 U	0.020 U	0.020 U, J	4.4
T4S1MW24	T4S1MW24-GW-1	5/6/2005	0.264 B	0.2 J	0.009 B	0.120	1.44	2.16	0.211	0.20 U	9.94 J	0.2 B	0.020 U	0.020 U	5.34 J
T4S1MW26	T4S1MW26-GW-1	9/16/2005	3.0 U	9.80	1.0 U	1.0 U	1.0 J	1.0 J	1.0 J	0.20 U	3.23	1.35	1.0 U	1.0 U	5.70 J

			Dissolved Metals (µg/L)												
Sample Location:	Sample ID:	Date Sampled:	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
T4S1MW08	T4S1MW08-GW-1	5/4/2005	0.05 U	0.13 B	0.020 U	0.02 U	1.4	0.18 U	0.02 U	0.2 U	6.89	1.0 U	0.020 U	0.020 U	4.68 U
T4S1MW08	T4S1MW08-GW-1	9/16/2005	1.01 J	0.230 J	0.110 U	0.100 U	0.0800 J	0.120 J	0.0800 U	0.0500 U	0.460 J	0.320 U	0.0800 U	0.0800 U	2.99 J
T4S1MW17	T4S1MW17-GW-1	5/4/2005	0.03 B	0.17 B	0.020 U	0.03 J	0.79	2.75 J	0.08	0.20 U	7.94	1.0 U	0.020 U	0.02 U	7.62
T4S1MW17	T4S1MW17-GW-1	9/16/2005	0.0400 U	0.310 J	0.110 U	0.100 U	0.390 J	0.440 J	0.0800 U	0.0500 U	5.11	0.320	0.0800 U	0.0800 U	0.800 J
T4S1MW19	T4S1MW19-GW-1	9/15/2004	0.04 B,N	3.1	0.02 U	0.02	2.89	0.51	0.02 U	0.2 U	4.89	5 U	0.02 U	0.02 U	2.3
T4S1MW19	T4S1MW19-GW-1	2/9/2005	0.05 U	1.9	0.006 B	0.083	0.72	0.64	0.461	0.20 U, J	6.95	0.9 B	0.020 U	0.020 U	5.0
T4S1MW19	T4S1MW19-GW-1	5/9/2005	0.03 B	1.85	0.009 B	0.06	2.53	0.75	0.02	0.20 U	7.71	0.8 B	0.007 B	0.015 B	11.5
T4S1MW22	T4S1MW22-GW-1	9/2/2004	0.03 B	0.4 B	0.014 B	0.03	0.66	0.79	0.019 B	0.2 U	8.67	0.4 B	0.02 U	0.009 B	2.8
T4S1MW22	T4S1MW22-GW-1	2/4/2005	0.05 U	0.2 B	0.020 U	0.082 U	0.28	0.54 J	0.069	0.2 U	5.83	1.0 U	0.020 U	0.020 U, J	1.6
T4S1MW22	T4S1MW22-GW-1	5/6/2005	0.028 B	0.2 J	0.020 U	0.067	0.2 U	0.32 B	0.028 U	0.20 U	2.7 J	1.0 U	0.020 U	0.02 U	1.51 J
T4S1MW23	T4S1MW23-GW-1	9/2/2004	0.05 U	3.9	0.02 U	0.02 U	0.36	0.37	0.01 B	0.2 U	4.02	0.5 B	0.02 U	0.004 B	2.7
T4S1MW23	T4S1MW23-GW-1	2/4/2005	0.05 U	3.7	0.020 U	0.039 U	0.2 U	0.32 J	0.067	0.2 U	2.42	1.0 U	0.020 U	0.020 U, J	1.4
T4S1MW23	T4S1MW23-GW-1	5/6/2005	0.023 B	2.1 J	0.020 U	0.158	0.61	0.32 B	0.08	0.20 U	2.98 J	1.0 U	0.020 U	0.02 U	3.07 J
T4S1MW24	T4S1MW24-GW-1	9/1/2004	0.06	1.6	0.011 B	0.06	1.37	1.86	1.78	0.2 U	15	3.6	0.02 U	0.006 B	15.4
T4S1MW24	T4S1MW24-GW-1	2/3/2005	0.02 B	0.5 U	0.010 B	0.057	0.58	1.82 J	0.042	0.2 U	10.4	1.0 U	0.020 U	0.020 U, J	4.0
T4S1MW24	T4S1MW24-GW-1	5/6/2005	0.251 B	0.2 J	0.007 B	0.098	1.12	1.97	0.082	0.20 U	10.5 J	1.0 U	0.020 U	0.02 U	6.36 J
T4S1MW26	T4S1MW26-GW-1	9/16/2005	0.0500 J	10.8	0.110 U	0.100 U	0.990 J	0.420 J	0.120 J	0.0500 U	3.52	0.710 J	0.0800 U	0.080 U	4.82 J

Please refer to notes at end of table.

- Notes:
1. Total/Dissolved Metals using EPA 6000-7000 Series Methods.
 2. µg/L = Micrograms per liter.
 3. B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 5. N = The matrix spike sample recovery is not within control limits. The case narrative suggests that this sample may be biased low.

TABLE 19B
GROUNDWATER CHEMISTRY RESULTS: METALS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			Total Metals (µg/L)												
Sample Location:	Sample ID:	Date Sampled:	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.05 U	8.3	0.02 U	0.02 U	0.23	0.52	0.016 B	0.04 B	3.36	0.4 B	0.02 U	0.009 B	0.8
T4S1MW09	T4S1MW09-GW-1	2/9/2005	0.03 B	11.2	0.015 B	0.069 U	2.65	1.30	0.190	0.20 U	5.49	1.0 U	0.027 U	0.008 J	2.6
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.05 B	10.6	0.052	0.16	6.29	2.88	0.8	0.2 U	7.82	0.1 B	0.006 B	0.015 B	8.11
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.05 U	0.6	0.024	0.02 U	0.6	1.9	0.156	0.05 B	5.7	0.3 B	0.02 U	0.004 B	2.3
T4S1MW10	T4S1MW10-GW-1	2/4/2005	0.05 U	0.4 B	0.020 U	0.06	0.81	0.62	0.046	0.05 B	3.6	0.3 B	0.020 U	0.020 U	5.5
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.02 B	0.35 B	0.020 U	0.08	0.43	0.79	0.06	0.2 U	4.61	0.2 B	0.020 U	0.007 B	2.53
T4S1MW11	T4S1MW11-GW-1	04/19/2004	0.03 B	7.6	0.02 U	0.05	0.43	2.13	0.26	0.10 U	4.95	0.8 B	0.01 U	0.018 U	9
T4S1MW11	T4S1MW11-GW-1	9/1/2004	0.04 B	17	0.02 B	0.02	0.37	1.24	0.092	0.04 B	4.64	1 U	0.02 U	0.014 B	2.3
T4S1MW11	T4S1MW11-GW-1	2/8/2005	0.05 U	10.0	0.020 U	0.03	0.26	0.44	0.017 B	0.20 U	3.1	0.2 B	0.020 U	0.020 U	0.6
T4S1MW11	T4S1MW11-GW-1	5/10/2005	0.05 U	6.9 J	0.02 U	0.02 U	0.96	1 U	0.075 U	0.20 U	1.85 J	1.0 U	0.02 U	0.02 U	1.95 U
T4S1MW12	T4S1MW12-GW-1	04/19/2004	0.03 B	2.1	0.03	0.02	0.56	6.36	0.2	0.10 U	3.96	1.2	0.01 U	0.017 B	3.56
T4S1MW12	T4S1MW12-GW-1	8/31/2004	0.05 U	10 U	0.01 B	0.02 U	2.71	0.87	0.13	0.2 U	3.47	5 U	0.02 U	0.02 U	1.6
T4S1MW12	T4S1MW12-GW-1	2/7/2005	0.04 B	1.1	0.006 B	0.03	0.84	0.87	0.062	0.06 B	2.6	0.3 B	0.015 B	0.020 U	6.5
T4S1MW12	T4S1MW12-GW-1	5/9/2005	0.14	3.1	0.036	0.15	12.3	3.74	2.27	0.2 U	11.9	0.2 B	0.020 U	0.008 B	11.5
T4S1MW13	T4S1MW13-GW-1	04/16/2004	0.03 B	15.4	0.02 U	0.02 B	0.66	0.72	0.03	0.10 U	2.3	0.3 B	0.01 B	0.041	1.2
T4S1MW13	T4S1MW13-GW-1	8/31/2004	0.05 U	5.8 B	0.02 U	0.02 U	2.55	0.39	0.02 U	0.2 U	3.51	5 U	0.02 U	0.02 U	0.5 B
T4S1MW13	T4S1MW13-GW-1	2/8/2005	0.05 U	14.2	0.020 U	0.02 U	0.47	0.29	0.030	0.05 B	2.1	1.0 U	0.020 U	0.020 U	1.2
T4S1MW13	T4S1MW13-GW-1	5/10/2005	0.05 U	15.4 J	0.02 U	0.024 U	1.63	0.83 B	0.292	0.20 U	1.97 J	1.0 U	0.02 U	0.02 U	2.73 U
T4S1MW15	T4S1MW15-GW-1	04/16/2004	0.02 U	0.02 U	0.02 U	0.01 B	0.43	1.34	0.05	0.10 U	0.3 B	0.2 U	0.01 U	0.006 B	0.6
T4S1MW15	T4S1MW15-GW-1	8/27/2004	0.05 U	10 U	0.01 B	0.02 U	4.12	1.91	1.1	0.2 U	9.56	5 U	0.02 U	0.02 U	3.1
T4S1MW15	T4S1MW15-GW-1	2/9/2005	0.05 U	0.3 B	0.008 B	0.086	1.36	1.32	0.425	0.20 U, J	9.44	1.0 U	0.020 U	0.020 U	2.3
T4S1MW15	T4S1MW15-GW-1	5/10/2005	0.1 U	2.7 J	0.112	0.056	21.9	9.23	10.9	0.20 U	20.4 J	2.0 U	0.04 U	0.04 U	31.5
T4S1MW16	T4S1MW16-GW-1	04/19/2004	0.06	0.9	0.04	0.18	0.23	4.98	0.11	0.10 U	7.34	1.8	0.03	0.072	9.68
T4S1MW16	T4S1MW16-GW-1	8/27/2004	0.33	0.8	0.058	0.06	1.65	14.3	1.12	0.2 U	4.62	0.5 B	0.02 U	0.01 B	13.7
T4S1MW16	T4S1MW16-GW-1	2/10/2005	0.11	0.5 B	0.011 B	0.222	0.57	3.89	0.689	0.20 U	2.52	0.5 B	0.02 U	0.020 U, J	10.3
T4S1MW20	T4S1MW20-GW-1	9/2/2004	0.05 U	1.9	0.027	0.03	0.85	0.95	0.186	0.2 U	10.8	0.8 B	0.02 U	0.005 B	4.4
T4S1MW20	T4S1MW20-GW-1	2/10/2005	0.05 U	1.5	0.011 B	0.095 U	0.21 U	0.64	0.133	0.20 U	10.1	0.7 B	0.02 U	0.008 J	2.3
T4S1MW20	T4S1MW20-GW-1	5/11/2005	0.05 U	1.1 J	0.02 U	0.038 U	1.37	0.69 B	0.176	0.20 U	7.14 J	1.0 U	0.02 U	0.02 U	2.74 U
T4S1MW21	T4S1MW21-GW-1	9/2/2004	0.05 U	0.2 B	0.017 B	0.04	0.48	0.59	0.056	0.2 U	20.3	0.3 B	0.011 B	0.007 B	3.1
T4S1MW21	T4S1MW21-GW-1	2/10/2005	0.05 U	0.5 U	0.015 B	0.113	0.24 U	0.68	0.100	0.20 U	18.0	0.2 B	0.02 U	0.009 J	4.5
T4S1MW21	T4S1MW21-GW-1	5/11/2005	0.063 U	0.4 J	0.035 U	0.397	3.25	1.48	1.110	0.20 U	11.7 J	1.0 U	0.02 U	0.02 U	5.78 U

Please refer to notes at end of table.

TABLE 19B
GROUNDWATER CHEMISTRY RESULTS: METALS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

			Dissolved Metals (µg/L)												
Sample Location:	Sample ID:	Date Sampled:	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
T4S1MW09	T4S1MW09-GW-1	9/1/2004	0.05 U	8.6	0.02 U	0.02 U	0.57	0.52	0.02 U	0.2 U	3.39	1 U	0.02 U	0.007 B	1
T4S1MW09	T4S1MW09-GW-1	2/9/2005	0.05 U	9.7	0.020 U	0.053	0.91	0.41	0.063	0.20 U	5.45	1.0 U	0.020 U	0.020 U	1.1
T4S1MW09	T4S1MW09-GW-1	5/9/2005	0.05 U	11.5	0.020 U	0.06	1.82	0.55	0.01 B	0.2 U	5.98	1 U	0.020 U	0.007 B	2.01
T4S1MW10	T4S1MW10-GW-1	9/1/2004	0.05 U	0.3 B	0.02 U	0.02 U	0.51	1.37	0.042	0.05 B	6.07	0.4 B	0.02 U	0.02 U	1
T4S1MW10	T4S1MW10-GW-1	2/4/2005	0.05 U	0.4 B	0.020 U	0.04	0.16 B	0.50	0.020 U	0.06 B	3.5	0.3 B	0.020 U	0.020 U	5.5
T4S1MW10	T4S1MW10-GW-1	5/9/2005	0.05 U	0.38 B	0.020 U	0.06	1.17	0.84	0.01 B	0.2 U	5.21	1 U	0.020 U	0.020 U	1.76
T4S1MW11	T4S1MW11-GW-1	04/19/2004	0.13	7.4	0.02 U	0.02	0.09 B	0.69	0.01 U	0.10 U	4.44	0.2 U	0.01 U	0.01 B	2.17
T4S1MW11	T4S1MW11-GW-1	9/1/2004	0.05 U	7.2	0.02 U	0.02 U	0.68	0.52	0.02 U	0.05 B	4.55	1 U	0.02 U	0.02 U	0.9
T4S1MW11	T4S1MW11-GW-1	2/8/2005	0.06	8.0	0.020 U	0.03	0.46	0.33	0.078	0.08 B	3.1	0.4 B	0.020 U	0.020 U	0.8
T4S1MW11	T4S1MW11-GW-1	5/10/2005	0.05 U	6.0 J	0.020 U	0.02 U	0.47	1 U	0.02 U	0.20 U	2.93 J	1.0 U	0.020 U	0.02 U	1.08 U
T4S1MW12	T4S1MW12-GW-1	04/19/2004	0.14	2	0.02 U	0.02 B	0.22	0.82	0.01 B	0.10 U	3.82	1.3	0.01 U	0.015 B	2.65
T4S1MW12	T4S1MW12-GW-1	8/31/2004	0.05 U	10 U	0.02 U	0.02 U	0.93	0.24	0.02 U	0.2 U	2.75	5 U	0.02 U	0.02 U	0.5
T4S1MW12	T4S1MW12-GW-1	2/7/2005	0.05 U	0.6	0.020 U	0.02 U	0.52	0.12	0.020 U	0.09 B	2.6	1.0 U	0.020 U	0.020 U	4.2
T4S1MW12	T4S1MW12-GW-1	5/9/2005	0.02 B	0.55	0.020 U	0.03 J	1.37	0.37	0.03	0.2 U	5.83	1 B	0.020 U	0.020 U	2.82
T4S1MW13	T4S1MW13-GW-1	04/16/2004	0.09	14.6	0.02 U	0.01 U	0.66	0.56	0.01 B	0.10 U	2.4	0.2 U	0.01 U	0.007 B	1.5
T4S1MW13	T4S1MW13-GW-1	8/31/2004	0.05 U	6.4 B	0.02 U	0.02 U	0.75	0.35	0.02 U	0.2 U	3.1	5 U	0.02 U	0.02 U	0.6
T4S1MW13	T4S1MW13-GW-1	2/8/2005	0.05 U	14.4	0.020 U	0.02	0.52	0.18	0.026	0.07 B	2.4	0.2 B	0.020 U	0.020 U	1.3
T4S1MW13	T4S1MW13-GW-1	5/10/2005	0.05 U	12.4 J	0.02 U	0.02 U	0.38 U	1 U	0.022 U	0.20 U	1.05 J	1.0 U	0.02 U	0.020 U	1.01 U
T4S1MW15	T4S1MW15-GW-1	04/16/2004	0.06	0.2 U	0.02 U	0.02	0.47	1.28	0.01 U	0.10 U	0.4	0.2 U	0.01 U	0.006 B	0.5
T4S1MW15	T4S1MW15-GW-1	8/27/2004	0.05 U	10 U	0.02 U	0.02 U	6.8	1.07	0.02	0.2 U	9.45	5 U	0.02 U	0.02 U	0.6
T4S1MW15	T4S1MW15-GW-1	2/9/2005	0.05 U	0.3 B	0.020 U	0.090	1.18	1.00	0.068	0.20 U, J	10.1	1.0 U	0.020 U	0.020 U	1.6
T4S1MW15	T4S1MW15-GW-1	5/10/2005	0.05 U	0.2 J	0.020 U	0.02 U	1.96	1 U	0.023 U	0.20 U	3.36 J	1.0 U	0.02 U	0.020 U	1.60 U
T4S1MW16	T4S1MW16-GW-1	04/19/2004	0.18	0.5	0.02 U	0.14	0.06 U	4.02	0.02	0.10 U	7.19	1.1	0.02 U	0.039	9.18
T4S1MW16	T4S1MW16-GW-1	8/27/2004	0.02 B	0.3 B	0.007 B	0.03	0.46	2.93	0.036	0.05 B	4.18	0.4 B	0.02 U	0.006 B	4.2
T4S1MW16	T4S1MW16-GW-1	2/10/2005	0.05	0.3 B	0.020 U	0.202	0.93	2.16	0.600	0.20 U, J	2.91	0.4 B	0.020 U	0.020 U	4.3
T4S1MW20	T4S1MW20-GW-1	9/2/2004	0.05 U	1.8	0.014 B	0.02	0.25	0.61	0.01 B	0.2 U	10.2	0.6 B	0.02 U	0.005 B	3.2
T4S1MW20	T4S1MW20-GW-1	2/10/2005	0.05 U	1.3	0.011 B	0.075	0.31	0.57	0.070	0.20 U, J	10.2	0.7 B	0.020 U	0.020 U	1.5
T4S1MW20	T4S1MW20-GW-1	5/11/2005	0.05 U	1.4 J	0.02 U	0.027 U	0.80	1 U	0.020 U	0.20 U	7.51 J	1.0 U	0.020 U	0.02 U	2.35 U
T4S1MW21	T4S1MW21-GW-1	9/2/2004	0.05 U	0.3 B	0.013 B	0.04	0.29	0.55	0.035	0.2 U	19.9	0.2 B	0.02 U	0.005 B	3.2
T4S1MW21	T4S1MW21-GW-1	2/10/2005	0.02 B	0.5 U	0.012 B	0.110	0.33	0.65	0.091	0.20 U, J	18.4	1.0 U	0.020 U	0.007 B	4.4
T4S1MW21	T4S1MW21-GW-1	5/11/2005	0.05 U	0.1 J	0.02 U	0.086	0.75	1 U	0.022 U	0.20 U	10.4 J	1.0 U	0.020 U	0.02 U	3.26 U

- Notes:
1. Total/Dissolved Metals using EPA 6000-7000 Series Methods.
 2. µg/L = Micrograms per liter.
 3. B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 5. N = The matrix spike sample recovery is not within control limits. The case narrative suggests that this sample may be biased low.

TABLE 20A
GRAB SAMPLE CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-01	T4S1SB-02	T4S1SB-03	T4S1SB-04	T4S1SB-9	T4S1SB-10	T4S1SB-11	T4S1SB-12	T4S1SB-14	T4S1SB-15	T4S1SB-16
Sample ID:	SB01-GW-1	SB02-GW-1	SB03-GW-1	SB04-GW-1	T4S1GW-9-1	T4S1GW-10-1	T4S1GW-11-1	T4S1GW-12-1	T4S1SB-14-1	T4S1GW-15-1	T4S1GW-16-1
Date Sampled:	04/01/2004	04/01/2004	04/05/2004	04/05/2004	9/1/2004	9/8/2004	9/9/2004	9/9/2004	8/24/2004	9/7/2004	9/7/2004
HCID (µg/L)											
Gasoline Range	--	--	--	--	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Diesel Range	--	--	--	--	630 U	630 U	630 U	630 U	630 U	630 U	630 U
Residual Range	--	--	--	--	630 U	630 U	630 U	630 U	630 U	630 U	630 U
TPH (µg/L)											
Gasoline Range	50 U	50 U	50 U	50 U	--	--	--	--	--	--	--
Diesel Range	250 U	250 U	250 U	250 U	--	--	--	--	--	--	--
Residual Range	500 U	500 U	500 U	500 U	--	--	--	--	--	--	--

Sample Location:	T4S1SB-17	T4S1SB-18	T4S1SB-19	T4S1SB-20	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-25	T4S1SB-26	T4S1SB-28
Sample ID:	T4S1GW-17-1	T4S1GW-18-1	T4S1GW-19-1	T4S1GW-20-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-25-1	T4S1GW-26-1	T4S1GW-28-1
Date Sampled:	9/7/2004	9/3/2004	9/9/2004	9/7/2004	9/13/2004	9/2/2004	9/2/2004	8/27/2004	8/27/2004	8/26/2004	8/26/2004
HCID (µg/L)											
Gasoline Range	250 U	250 U	--	--	--	--	--	--	--	--	--
Diesel Range	630 U	630 U	--	--	--	--	--	--	--	--	--
Residual Range	630 U	630 U	--	--	--	--	--	--	--	--	--
TPH (µg/L)											
Gasoline Range	--	--	13 J	12 J	12 J	16 J	18 J	--	250 U	250 U	250 U
Diesel Range	--	--	250 U	250 U	250 U	430 H	250 U	250 U	250 U	250 U	250 U
Residual Range	--	--	500 U	500 U	500 U	1,800 O	500 U	500 U	500 U	500 U	500 U

Sample Location:	T4S1SB-31	T4S1SB-32	T4S1SB-33	T4S1SB-34	T4S1SB-35	T4S1SB-36	T4S1SB-37	T4S1SB-38	T4S1SB-39	T4S1SB-40	T4S1SB-41
Sample ID:	T4S1GW-31-1	T4S1GW-32-1	T4S1GW-33-1	T4S1GW-34-1	T4S1GW-35-1	T4S1GW-36-1	T4S1GW-37-1	T4S1GW-38-1	T4S1GW-39-1	T4S1GW-40-1	T4S1GW-41-1
Date Sampled:	9/8/2004	9/3/2004	9/3/2004	9/1/2004	9/1/2004	9/3/2004	9/1/2004	8/31/2004	9/1/2004	8/27/2004	8/27/2004
HCID (µg/L)											
Gasoline Range	--	--	--	--	--	--	--	--	--	--	--
Diesel Range	--	--	--	--	--	--	--	--	--	--	--
Residual Range	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range	13 J	12 J	250 U	250 U	250 U	250 U	250 U	250 U	250 U	--	--
Diesel Range	250 U	250 U	630 U	630 U	630 U	630 U	630 U	630 U	630 U	250 U	250 U
Residual Range	500 U	500 U	630 U	630 U	630 U	630 U	630 U	630 U	630 U	500 U	500 U

Please refer to notes at end of table.

TABLE 20A
GRAB SAMPLE CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1GW-42	T4S1SB-43	T4S1SB-44	T4S1SB-45	T4S1SB-46	T4S1SB-47	T4S1SB-48	T4S1SB-49
Sample ID:	T4S1GW-42-1	T4S1GW-43-1	T4S1GW-44-1	T4S1SB-45-1	T4S1SB-46-1	T4S1SB-47-1	T4S1SB-48-1	T4S1SB-49-1
Date Sampled:	9/7/2004	8/31/2004	8/31/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004
HCID (µg/L)								
Gasoline Range	250 U	--	--	250 U	250 U	250 U	--	--
Diesel Range	630 U	--	--	630 U	630 U	630 U	--	--
Residual Range	630 U	--	--	630 U	630 U	630 U	--	--
TPH (µg/L)								
Gasoline Range	--	250 U	19 J	--	--	--	250 U	250 U
Diesel Range	--	250 U	250 U	--	--	--	250 U	250 U
Residual Range	--	500 U	500 U	--	--	--	500 U	500 U

Sample Location:	T4S1SB-50	T4S1SB-82	T4S1SB-83	T4S1SB-84	T4S1SB-85	T4S1SB-86	T4S1SB-87
Sample ID:	T4S1SB-50-1	T4S1GW-82-1	T4S1GW-83-1	T4S1GW-84-1	T4S1GW-85-1	T4S1GW-86-1	T4S1GW-87-1
Date Sampled:	8/23/2004	9/1/2004	9/1/2004	9/9/2004	9/8/2004	9/8/2004	9/8/2004
HCID (µg/L)							
Gasoline Range	--	--	--	--	250 U	250 U	250 U
Diesel Range	--	--	--	--	630 U	630 U	630 U
Residual Range	--	--	--	--	630 U	630 U	630 U
TPH (µg/L)							
Gasoline Range	250 U	250 U	250 U	250 U	--	--	--
Diesel Range	250 U	67 J	250 U	250 U	--	--	--
Residual Range	500 U	75 J	500 U	130 J	--	--	--

- Notes:
1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 6. H = The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
 7. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

TABLE 20B
GRAB SAMPLE CHEMISTRY RESULTS: PETROLEUM HYDROCARBONS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-05	T4S1SB-06	T4S1SB-07	T4S1SB-08	T4S1SB-51	T4S1SB-52	T4S1SB-53	T4S1SB-54	T4S1SB-55
Sample ID:	SB05-GW-1	SB06-GW-1	SB07-GW-1	SB08-GW-1	T4S1GW-51-1	T4S1GW-52-1	T4S1GW-53-1	T4S1GW-54-1	T4S1GW-55-1
Date Sampled:	03/31/2004	03/31/2004	03/30/2004	03/31/2004	9/1/2004	9/1/2004	8/30/2004	9/1/2004	8/31/2004
HCID (µg/L)									
Gasoline Range	--	--	--	--	250 U	250 U	--	--	250 U
Diesel Range	--	--	--	--	630 U	630 U	--	--	630 U
Residual Range	--	--	--	--	630 U	630 U	--	--	630 U
TPH (µg/L)									
Gasoline Range	50 U	50 U	50 U	50 U	36 J	14 J	250 U	13 J	--
Diesel Range	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	--
Residual Range	500 U	500 U	500 U	500 U	86 J	500 U	500 U	500 U	--

Sample Location:	T4S1SB-56	T4S1SB-57	T4S1SB-58	T4S1SB-59	T4S1SB-60	T4S1SB-63	T4S1SB-64	T4S1SB-65	T4S1SB-66
Sample ID:	T4S1GW-56-1	T4S1GW-57-1	T4S1GW-58-1	T4S1GW-59-1	T4S1GW-60-1	T4S1GW-63-1	T4S1GW-64-1	T4S1GW-65-1	T4S1GW-66-1
Date Sampled:	8/31/2004	8/31/2004	8/31/2004	9/9/2004	8/30/2004	9/9/2004	9/9/2004	8/31/2004	9/9/2004
HCID (µg/L)									
Gasoline Range	250 U	250 U	250 U	--	--	--	--	--	--
Diesel Range	630 U	630 U	630 U	--	--	--	--	--	--
Residual Range	630 U	630 U	630 U	--	--	--	--	--	--
TPH (µg/L)									
Gasoline Range	--	--	--	250 U	16 J	250 U	15 J	12 J	250 U
Diesel Range	--	--	--	250 U	250 U	250 U	250 U	250 U	250 U
Residual Range	--	--	--	500 U	500 U	500 U	500 U	500 U	500 U

Sample Location:	T4S1SB-67	T4S1SB-68	T4S1SB-69	T4S1SB-77	T4S1SB-78	T4S1SB-79	T4S1SB-80	T4S1SB-81
Sample ID:	T4S1GW-67-1	T4S1GW-68-1	T4S1GW-69-1	T4S1GW-77-1	T4S1GW-78-1	T4S1GW-79-1	T4S1GW-80-1	T4S1GW-81-1
Date Sampled:	9/8/2004	9/9/2004	9/9/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
HCID (µg/L)								
Gasoline Range	--	--	--	--	--	--	--	--
Diesel Range	--	--	--	--	--	--	--	--
Residual Range	--	--	--	--	--	--	--	--
TPH (µg/L)								
Gasoline Range	130 J	250 U	250 U	14 J	13 J	250 U	--	250 U
Diesel Range	160 J	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Residual Range	84 J	500 U	500 U	500 U	500 U	500 U	500 U	500 U

- Notes:
1. TPH =Total petroleum hydrocarbons (TPH) by Northwest Total Petroleum Hydrocarbons (NWTPH).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 21A
GRAB SAMPLE CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-01	T4S1SB-02	T4S1SB-03	T4S1SB-04	T4S1SB-09	T4S1SB-10	T4S1SB-11	T4S1SB-12	T4S1SB-14	T4S1SB-15	T4S1SB-16
Sample ID:	SB01-GW-1	SB02-GW-1	SB03-GW-1	SB04-GW-1	T4S1GW-9-1	T4S1GW-10-1	T4S1GW-11-1	T4S1GW-12-1	T4S1SB-14-1	T4S1GW-15-1	T4S1GW-16-1
Lab ID:					K2406700-015	K2406847-006	K2406982-005	K2406982-002	K2406369-003	K2406805-008	K2406805-006
Date Sampled:	04/01/2004	04/01/2004	04/05/2004	04/05/2004	9/1/2004	9/8/2004	9/9/2004	9/9/2004	8/24/2004	9/7/2004	9/7/2004
PAHs (µg/L)											
Naphthalene	0.020 U	0.020 U	0.0086	0.023	0.036	0.037	0.051	0.064	0.02 U	0.02 U	0.02 U
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	0.016 J	0.012 J	0.035	0.022	0.0068 J	0.0086 J	0.0098 J
Acenaphthylene	0.020 U	0.020 U	0.020 U	0.020 U	0.0022 J	0.0018 J	0.0071 J	0.022	0.0072 J	0.02 U	0.0049 J
Acenaphthene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.0031 J	0.0058 J	0.02 U	0.02 U	0.02 U
Dibenzofuran	--	--	--	--	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Fluorene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.0042 J	0.0071 J	0.0026 J	0.02 U	0.02 U
Phenanthrene	0.015 J	0.020 U	0.020 U	0.020 U	0.0073 J	0.02 U	0.035	0.069	0.029	0.014 J	0.016 J
Anthracene	0.012 J	0.017 J	0.010 J	0.020 U	0.0055 J	0.02 U	0.011 J	0.022	0.021	0.013 J	0.02 J
Fluoranthene	0.019 J	0.020 U	0.020 U	0.020 U	0.0079 J	0.004 J	0.08	0.081	0.049	0.02 U	0.03
Pyrene	0.023	0.020 U	0.020 U	0.020 U	0.0056 J	0.02 U	0.086	0.091	0.063	0.022	0.04
Benz(a)anthracene	0.013 J	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.029	0.038	0.033	0.0075 J	0.02 J
Chrysene	0.012 J	0.020 U	0.020 U	0.020 U	0.0028 J	0.02 U	0.039	0.047	0.036	0.0078 J	0.022
Benzo(b)fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.0022 J	0.02 U	0.023	0.028	0.017 J	0.02 U	0.0089 J
Benzo(k)fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.0015 J	0.02 U	0.025	0.029	0.019 J	0.02 U	0.013 J
Benzo(a)pyrene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.027	0.031	0.024	0.0052 J	0.017 J
Indeno(1,2,3-cd)pyrene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.021	0.024	0.0099 J	0.02 U	0.0078 J
Dibenz(a,h)anthracene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.0039 J	0.0053 J	0.0023 J	0.02 U	0.02 U
Benzo(g,h,i)perylene	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.02 U	0.022	0.025	0.011 J	0.02 U	0.0075 J

Sample Location:	T4S1SB-17	T4S1SB-18	T4S1SB-19	T4S1SB-20	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-25	T4S1SB-26	T4S1SB-28
Sample ID:	T4S1GW-17-1	T4S1GW-18-1	T4S1GW-19-1	T4S1GW-20-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-25-1	T4S1GW-26-1	T4S1GW-28-1
Date Sampled:	9/7/2004	9/3/2004	9/9/2004	9/7/2004	9/13/2004	9/1/2004	9/2/2004	8/27/2004	8/27/2004	8/26/2004	8/26/2004
PAHs (µg/L)											
Naphthalene	0.012 J	0.027	0.15	0.037	0.037	1.3	0.051	0.056	0.029	0.018 J	0.024
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	0.0073 J	0.014 J	0.065	0.015 J	0.028	0.28	0.043	0.018 J	0.0099 J	0.0091 J	0.014 J
Acenaphthylene	0.02 U	0.0027 J	0.076	0.021 U	0.02 U	1.7	0.077	0.02 U	0.02 U	0.0025 J	0.0026 J
Acenaphthene	0.02 U	0.0021 J	0.013 J	0.021 U	0.02 Ui	0.75	0.15	0.0048 J	0.02 U	0.0023 J	0.02 U
Dibenzofuran	0.02 U	0.02 U	0.015 J	0.021 U	0.02 U	0.43	0.015 J	0.02 U	0.02 U	0.02 U	0.02 U
Fluorene	0.02 U	0.0031 J	0.031	0.021 U	0.004 J	0.98	0.2	0.02 U	0.02 U	0.0039 J	0.0031 J
Phenanthrene	0.02 U	0.02 U	0.23	0.021 U	0.02 U	6.5	0.44	0.02 U	0.02 U	0.02 U	0.02 U
Anthracene	0.038	0.0052 J	0.072	0.016 J	0.02 U	1.5	0.12	0.0075 J	0.02 U	0.02 U	0.02 U
Fluoranthene	0.011 J	0.0091 J	0.27	0.021 U	0.0038 J	8	0.33	0.043	0.02 U	0.02 U	0.02 U
Pyrene	0.02 U	0.0095 J	0.36	0.021 U	0.0035 J	7.7	0.68	0.037	0.02 U	0.02 U	0.02 U
Benz(a)anthracene	0.0048 J	0.0025 J	0.088	0.021 U	0.02 U	3	0.13	0.02 U	0.02 U	0.02 U	0.02 U
Chrysene	0.02 U	0.0031 J	0.13	0.021 U	0.02 U	3.9	0.16	0.021	0.02 U	0.02 U	0.02 U
Benzo(b)fluoranthene	0.0036 J	0.02 U	0.06	0.021 U	0.02 U	2.9	0.058	0.013 J	0.02 U	0.02 U	0.02 U
Benzo(k)fluoranthene	0.0036 J	0.0014 J	0.071	0.021 U	0.02 U	3.1	0.078	0.0099 J	0.02 U	0.02 U	0.02 U
Benzo(a)pyrene	0.0042 J	0.0023 J	0.081	0.021 U	0.02 U	3.4	0.1	0.0085 J	0.02 U	0.02 U	0.02 U
Indeno(1,2,3-cd)pyrene	0.0025 J	0.02 U	0.072	0.021 U	0.02 U	2.8	0.052	0.02 U	0.02 U	0.02 U	0.02 U
Dibenz(a,h)anthracene	0.02 U	0.02 U	0.012 J	0.021 U	0.02 U	0.57	0.012 J	0.02 U	0.02 U	0.02 U	0.02 U
Benzo(g,h,i)perylene	0.02 U	0.02 U	0.083	0.021 U	0.02 U	2.4	0.055	0.0071 J	0.02 U	0.02 U	0.02 U

Please refer to notes at end of table.

TABLE 21A
GRAB SAMPLE CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-31	T4S1SB-32	T4S1SB-33	T4S1SB-34	T4S1SB-35	T4S1SB-36	T4S1SB-37	T4S1SB-38	T4S1SB-39	T4S1SB-40	T4S1SB-41
Sample ID:	T4S1GW-31-1	T4S1GW-32-1	T4S1GW-33-1	T4S1GW-34-1	T4S1GW-35-1	T4S1GW-36-1	T4S1GW-37-1	T4S1GW-38-1	T4S1GW-39-1	T4S1GW-40-1	T4S1GW-41-1
Lab ID:	K2406926-001	K2406760-007	K2406805-001	K2406700-012	K2406700-014	K2406760-004	K2406700-017	K2406645-009	K2406700-013	K2406536-001	K2406536-002
Date Sampled:	9/8/2004	9/3/2004	9/3/2004	9/1/2004	9/1/2004	9/3/2004	9/1/2004	8/31/2004	9/1/2004	8/27/2004	8/27/2004
PAHs (µg/L)											
Naphthalene	0.026	0.012 J	0.016 J	0.023	0.058	0.064	0.056	0.041	0.069	0.016 J	0.011 J
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	0.016 J	0.0066 J	0.0093 J	0.012 J	0.029	0.021	0.018 J	0.026	0.02	0.011 J	0.007 J
Acenaphthylene	0.013 J	0.0019 J	0.02 U	0.02 U	0.02 U	0.0032 J	0.0022 J	0.025 U	0.0026 J	0.02 U	0.02 U
Acenaphthene	0.0058 J	0.02 U	0.02 U	0.02 U	0.02 U	0.0027 J	0.02 U	0.025 U	0.02 U	0.02 U	0.02 U
Dibenzofuran	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.025 U	0.02 U	0.02 U	0.02 U
Fluorene	0.009 J	0.0027 J	0.02 U	0.02 U	0.0027 J	0.02 U	0.0027 J	0.0046 J	0.02 U	0.02 U	0.02 U
Phenanthrene	0.091	0.02 U	0.0092 J	0.0039 J	0.0064 J	0.02 U	0.01 J	0.0073 J	0.0086 J	0.0045 J	0.0046 J
Anthracene	0.029	0.017 J	0.017 J	0.0012 J	0.0027 J	0.0029 J	0.0025 J	0.0039 J	0.0029 J	0.023	0.032
Fluoranthene	0.11	0.012 J	0.0079 J	0.02 U	0.0037 J	0.0054 J	0.011 J	0.025 U	0.012 J	0.0077 J	0.0066 J
Pyrene	0.15	0.013 J	0.0076 J	0.02 U	0.0035 J	0.0053 J	0.014 J	0.025 U	0.014 J	0.013 J	0.01 J
Benz(a)anthracene	0.057	0.0065 J	0.02 U	0.02 U	0.02 U	0.02 U	0.0076 J	0.025 U	0.005 J	0.0044 J	0.02 U
Chrysene	0.064	0.0062 J	0.02 U	0.02 U	0.0014 J	0.0023 J	0.024	0.025 U	0.0043 J	0.02 U	0.0042 J
Benzo(b)fluoranthene	0.024	0.0043 J	0.02 U	0.02 U	0.02 U	0.02 U	0.0082 J	0.025 U	0.0031 J	0.02 U	0.02 U
Benzo(k)fluoranthene	0.031	0.004 J	0.02 U	0.02 U	0.02 U	0.02 U	0.0046 J	0.025 U	0.0027 J	0.02 U	0.02 U
Benzo(a)pyrene	0.044	0.0048 J	0.02 U	0.02 U	0.02 U	0.0025 J	0.0057 J	0.025 U	0.0033 J	0.02 U	0.02 U
Indeno(1,2,3-cd)pyrene	0.019 J	0.0029 J	0.02 U	0.02 U	0.02 U	0.0022 J	0.0042 J	0.025 U	0.0025 J	0.02 U	0.02 U
Dibenz(a,h)anthracene	0.0045 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0026 J	0.025 U	0.02 U	0.02 U	0.02 U
Benzo(g,h,i)perylene	0.019 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0085 J	0.025 U	0.02 U	0.02 U	0.02 U

Sample Location:	T4S1SB-42	T4S1SB-43	T4S1SB-44	T4S1SB-45	T4S1SB-46	T4S1SB-47	T4S1SB-48	T4S1SB-49	T4S1SB-50
Sample ID:	T4S1GW-42-1	T4S1GW-43-1	T4S1GW-44-1	T4S1SB-45-1	T4S1SB-46-1	T4S1SB-47-1	T4S1SB-48-1	T4S1SB-49-1	T4S1SB-50-1
Date Sampled:	9/7/2004	8/31/2004	8/31/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004
PAHs (µg/L)									
Naphthalene	0.033	0.02 U	0.014 J	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	0.018 J	0.02 U	0.0066 J	0.0077 J	0.0067 J	0.0066 J	0.0075 J	0.0066 J	0.0061 J
Acenaphthylene	0.005 J	0.0067 J	0.003 J	0.0054 J	0.013 J	0.011 J	0.0036 J	0.0029 J	0.0023 J
Acenaphthene	0.02 U	0.0022 J	0.0022 J	0.02 U	0.004 J	0.0025 J	0.02 U	0.02 U	0.02 U
Dibenzofuran	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Fluorene	0.02 U	0.02 U	0.02 U	0.0026 J	0.005 J	0.0038 J	0.02 U	0.02 U	0.02 U
Phenanthrene	0.028	0.019 J	0.02 U	0.024 U	0.066	0.042	0.02 U	0.02 U	0.02 U
Anthracene	0.019 J	0.0097 J	0.017 J	0.012 J	0.032	0.021	0.0075 J	0.0073 J	0.0087 J
Fluoranthene	0.024	0.044	0.023	0.037	0.11	0.069	0.021	0.018 J	0.016 J
Pyrene	0.026	0.051	0.025	0.047	0.15	0.1	0.024	0.018 J	0.016 J
Benz(a)anthracene	0.02 U	0.028	0.011 J	0.022	0.069	0.049	0.0093 J	0.0089 J	0.0067 J
Chrysene	0.0096 J	0.032	0.011 J	0.023	0.07	0.052	0.0082 J	0.0069 J	0.0041 J
Benzo(b)fluoranthene	0.02 U	0.018 J	0.0081 J	0.012 J	0.029	0.023	0.0052 J	0.0043 J	0.0026 J
Benzo(k)fluoranthene	0.0044 J	0.022	0.0062 J	0.015 J	0.038	0.026	0.006 J	0.0042 J	0.0029 J
Benzo(a)pyrene	0.0063 J	0.026	0.0078 J	0.018 J	0.053	0.04	0.0063 J	0.005 J	0.003 J
Indeno(1,2,3-cd)pyrene	0.02 U	0.015 J	0.0064 J	0.0099 J	0.022	0.015 J	0.0032 J	0.0026 J	0.02 U
Dibenz(a,h)anthracene	0.02 U	0.0033 J	0.0019 J	0.0029 J	0.0052 J	0.0035 J	0.02 U	0.02 U	0.02 U
Benzo(g,h,i)perylene	0.02 U	0.015 J	0.0067 J	0.012 J	0.023	0.017 J	0.005 J	0.02 U	0.02 U

TABLE 21A
GRAB SAMPLE CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-82	T4S1SB-83	T4S1SB-84	T4S1SB-85
Sample ID:	T4S1GW-82-1	T4S1GW-83-1	T4S1GW-84-1	T4S1GW-85-1
Lab ID:	K2406645-013	K2406645-011	K2406982-001	K2406847-004
Date Sampled:	9/1/2004	9/1/2004	9/9/2004	9/8/2004
PAHs (µg/L)				
Naphthalene	0.016 J	0.019 J	0.23	2.2
1-Methylphenanthrene	--	--	--	--
2-Methylnaphthalene	0.0078 J	0.009 J	0.12	6.7
Acenaphthylene	0.0076 J	0.02 U	0.1	0.4
Acenaphthene	0.02 U	0.02 U	0.031	20 D
Dibenzofuran	0.02 U	0.02 U	0.028	8.3
Fluorene	0.02 U	0.02 U	0.03	15 D
Phenanthrene	0.033	0.017 J	0.35	35 D
Anthracene	0.029	0.016 J	0.15	2.6
Fluoranthene	0.053	0.012 J	0.82	12 D
Pyrene	0.067	0.01 J	1.1	7.7
Benz(a)anthracene	0.033	0.02 U	0.47	1.3
Chrysene	0.037	0.02 U	0.65	1.1
Benzo(b)fluoranthene	0.018 J	0.02 U	0.44	0.34
Benzo(k)fluoranthene	0.022	0.02 U	0.42	0.29
Benzo(a)pyrene	0.027	0.02 U	0.6	0.26
Indeno(1,2,3-cd)pyrene	0.013 J	0.02 U	0.48	0.069
Dibenz(a,h)anthracene	0.02 U	0.02 U	0.11	0.016 J
Benzo(g,h,i)perylene	0.013 J	0.02 U	0.56	0.052

- Notes:**
1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 6. i = The MRL/MDL was raised due to a chromatographic interference.
 7. D = The reported result is from a dilution.

TABLE 21B
GRAB SAMPLE CHEMISTRY RESULTS: POLYNUCLEAR AROMATIC HYDROCARBONS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-05	T4S1SB-06	T4S1SB-07	T4S1SB-08	T4S1SB-51	T4S1SB-52	T4S1SB-53	T4S1SB-54	T4S1SB-55	T4S1SB-56	T4S1SB-57	T4S1SB-58	T4S1SB-59
Sample ID:	SB05-GW-1	SB06-GW-1	SB07-GW-1	SB08-GW-1	T4S1GW-51-1	T4S1GW-52-1	T4S1GW-53-1	T4S1GW-54-1	T4S1GW-55-1	T4S1GW-56-1	T4S1GW-57-1	T4S1GW-58-1	T4S1GW-59-1
Date Sampled:	03/31/2004	03/31/2004	03/30/2004	03/31/2004	9/1/2004	9/1/2004	8/30/2004	9/1/2004	8/31/2004	8/31/2004	8/31/2004	8/31/2004	9/9/2004
PAHs (µg/L)													
Naphthalene	0.020 U	0.020 U	0.006 J	0.020 U	0.15	0.11	0.014 J	0.19	0.02 U	0.02 U	0.023	0.02	0.02
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	0.067	0.036	0.0092 J	0.091	0.02 U	0.02 U	0.02 U	0.02 U	0.016 J
Acenaphthylene	0.020 U	0.020 U	0.023 U	0.020 U	0.036	0.006 J	0.003 J	0.0088 J	0.0073 J	0.0058 J	0.0084 J	0.0061 J	0.011 J
Acenaphthene	0.020 U	0.020 U	0.023 U	0.020 U	0.012 J	0.0026 J	0.02 U	0.0037 J	0.0036 J	0.0034 J	0.0036 J	0.0028 J	0.048
Dibenzofuran	--	--	--	--	0.0073 J	0.02 U	0.02 U	0.0073 J	0.02 U	0.02 U	0.02 U	0.02 U	0.01 J
Fluorene	0.020 U	0.020 U	0.023 U	0.020 U	0.013 J	0.0035 J	0.0032 J	0.0076 J	0.004 J	0.0054 J	0.0033 J	0.02 U	0.02
Phenanthrene	0.020 U	0.020 U	0.011 J	0.027	0.14	0.025	0.02 U	0.047	0.036	0.037	0.037	0.024	0.23
Anthracene	0.022	0.017 J	0.023 U	0.093	0.056	0.0068 J	0.01 J	0.015 J	0.016 J	0.015 J	0.016 J	0.013 J	0.05
Fluoranthene	0.020 U	0.020 U	0.019 J	0.041	0.27	0.035	0.02 U	0.033	0.04	0.046	0.064	0.041	0.49
Pyrene	0.013 J	0.020 U	0.017 J	0.043	0.33	0.044	0.043	0.038	0.051	0.053	0.076	0.045	0.55
Benz(a)anthracene	0.020 U	0.020 U	0.012 J	0.039	0.15	0.017 J	0.02 U	0.012 J	0.024	0.023	0.04	0.024	0.32
Chrysene	0.020 U	0.020 U	0.014 J	0.038	0.2	0.024	0.02 U	0.016 J	0.027	0.023	0.043	0.024	0.4
Benzo(b)fluoranthene	0.011 J	0.020 U	0.016 J	0.038	0.13	0.017 J	0.02 U	0.013 J	0.011 J	0.0095 J	0.026	0.013 J	0.44
Benzo(k)fluoranthene	0.020 U	0.020 U	0.011 J	0.039	0.13	0.012 J	0.02 U	0.011 J	0.016 J	0.014 J	0.028	0.016 J	0.38
Benzo(a)pyrene	0.020 U	0.020 U	0.013 J	0.037	0.17	0.017 J	0.02 U	0.012 J	0.018 J	0.016 J	0.033	0.019 J	0.44
Indeno(1,2,3-cd)pyrene	0.0093 J	0.020 U	0.0097 J	0.043	0.13	0.013 J	0.02 U	0.011 J	0.0091 J	0.0075 J	0.019 J	0.0095 J	0.38
Dibenz(a,h)anthracene	0.0085 J	0.020 U	0.023 U	0.04	0.024	0.0026 J	0.02 U	0.0025 J	0.0024 J	0.0021 J	0.0044 J	0.0026 J	0.075
Benzo(g,h,i)perylene	0.010 J	0.020 U	0.011 J	0.041	0.15	0.016 J	0.02 U	0.011 J	0.0087 J	0.0078 J	0.02 J	0.0096 J	0.35

Sample Location:	T4S1SB-60	T4S1SB-63	T4S1SB-64	T4S1SB-65	T4S1SB-66	T4S1SB-67	T4S1SB-68	T4S1SB-69	T4S1SB-77	T4S1SB-78	T4S1SB-79	T4S1SB-80	T4S1SB-81
Sample ID:	T4S1GW-60-1	T4S1GW-63-1	T4S1GW-64-1	T4S1GW-65-1	T4S1GW-66-1	T4S1GW-67-1	T4S1GW-68-1	T4S1GW-69-1	T4S1GW-77-1	T4S1GW-78-1	T4S1GW-79-1	T4S1GW-80-1	T4S1GW-81-1
Date Sampled:	8/30/2004	9/9/2004	9/9/2004	8/31/2004	9/9/2004	9/8/2004	9/9/2004	9/9/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
PAHs (µg/L)													
Naphthalene	0.014 J	0.02	0.02 J	0.011 J	0.014 J	0.15	0.016 J	0.012 J	9.6 U	9.6 U	0.02 U	0.019 J	0.02 U
1-Methylphenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	0.0055 J	0.016 J	0.011 J	0.0056 J	0.01 J	1.2	0.011 J	0.0087 J	9.6 U	9.6 U	0.02 U	0.012 J	0.02 U
Acenaphthylene	0.0051 J	0.0052 J	0.0047 J	0.007 J	0.0058 J	0.02 U	0.0038 J	0.02 U	9.6 U	9.6 U	0.004 J	0.0058 J	0.0047 J
Acenaphthene	0.0035 J	0.0027 J	0.0024 J	0.0026 J	0.0037 J	0.23	0.0072 J	0.002 J	0.02 U	0.02 U	0.0022 J	0.034	0.0043 J
Dibenzofuran	0.019 U	0.02 U	0.02 U	0.02 U	0.02 U	0.068	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.009 J	0.02 U
Fluorene	0.0036 J	0.0032 J	0.0047 J	0.0029 J	0.0083 J	0.36	0.0045 J	0.02 U	0.02 U	0.02 U	0.0036 J	0.015 J	0.0048 J
Phenanthrene	0.025	0.031 U	0.028	0.031	0.052	0.87	0.042	0.02 U	9.6 U	9.6 U	0.02	0.2	0.026
Anthracene	0.017 J	0.017 J	0.011 J	0.018 J	0.015 J	0.15	0.013 J	0.02 U	9.6 U	9.6 U	0.0091 J	0.038	0.012 J
Fluoranthene	0.05	0.051	0.022	0.049	0.061	0.049	0.073	0.017 J	9.6 U	9.6 U	0.02	0.43	0.047
Pyrene	0.055	0.063	0.032	0.061	0.068	0.22	0.085	0.02 U	9.6 U	9.6 U	0.023	0.45	0.05
Benz(a)anthracene	0.03	0.03	0.012 J	0.027	0.029	0.054	0.044	0.0096 J	9.6 U	9.6 U	0.011 J	0.26	0.025
Chrysene	0.036	0.034	0.019 J	0.028	0.031	0.11	0.051	0.02 U	9.6 U	9.6 U	0.011 J	0.32	0.03
Benzo(b)fluoranthene	0.028	0.027	0.0088 J	0.015 J	0.025	0.0091 J	0.05	0.01 J	9.6 U	9.6 U	0.006 J	0.34	0.022
Benzo(k)fluoranthene	0.027	0.028	0.0073 J	0.016 J	0.022	0.0038 J	0.042	0.0071 J	9.6 U	9.6 U	0.0064 J	0.29	0.023
Benzo(a)pyrene	0.029	0.03	0.011 J	0.021	0.029	0.013 J	0.05	0.011 J	9.6 U	9.6 U	0.008 J	0.34	0.024
Indeno(1,2,3-cd)pyrene	0.021	0.024	0.0083 J	0.011 J	0.02	0.0028 J	0.041	0.007 J	9.6 U	9.6 U	0.0051 J	0.28	0.017 J
Dibenz(a,h)anthracene	0.0059 J	0.0052 J	0.02 U	0.0027 J	0.0042 J	0.0019 J	0.0087 J	0.0019 J	9.6 U	9.6 U	0.02 U	0.054	0.0039 J
Benzo(g,h,i)perylene	0.022	0.023	0.01 J	0.01 J	0.019 J	0.0068 J	0.038	0.007 J	9.6 U	9.6 U	0.0053 J	0.28	0.018 J

- Notes:
1. PAHs = Polycyclic Aromatic Hydrocarbons by EPA Method 8270C (SIM).
 2. µg/L = Micrograms per liter.
 3. -- = Not analyzed.
 4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 22A
GRAB SAMPLE CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-14	T4S1SB-15	T4S1SB-16	T4S1SB-42
Sample ID:	T4S1SB-14-1	T4S1GW-15-1	T4S1GW-16-1	T4S1GW-42-1
Date Sampled:	8/26/2004	9/7/2004	9/7/2004	9/7/2004
SVOCs (µg/L)				
Phenol	0.2 U	0.2 U	0.2 U	0.2 U
4-Methylphenol	0.48 U	0.48 U	0.48 U	0.48 U
Isophorone	0.016 J	0.2 U	0.019 J	0.016 J
4-Chloroaniline	0.2 U	0.2 U	0.2 U	0.2 U
4-Chloro-3-methylphenol	0.2 U	0.2 U	0.2 U	0.2 U
Dimethyl Phthalate	0.2 U	0.2 U	0.022 J	0.017 J
Diethyl Phthalate	0.068 J	0.2 U	0.2 U	0.2 U
Di-n-butyl Phthalate	0.2 U	0.2 U	0.2 U	0.2 U

Notes:

1. Only selected compounds are reported in the table. The complete analyte list is presented in the Sampling and Analysis Plan (Appendix A) of the RI Work Plan (Hart Crowser, 2004a).
2. SVOCs = Semivolatile Organic Compounds by EPA Method 8270C.
3. µg/L = Micrograms per liter.
4. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 22B
GRAB SAMPLE CHEMISTRY RESULTS: SEMI-VOLATILE ORGANIC COMPOUNDS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-77	T4S1SB-78
Sample ID:	T4S1GW-77-1	T4S1GW-78-1
Date Sampled:	8/30/2004	8/30/2004
SVOCs (µg/L)		
Phenol	9.6 U	9.6 U
4-Methylphenol	9.6 U	9.6 U
Isophorone	9.6 U	9.6 U
4-Chloroaniline	9.6 U	9.6 U
4-Chloro-3-methylphenol	9.6 U	9.6 U
Dimethyl Phthalate	9.6 U	9.6 U
Diethyl Phthalate	9.6 U	9.6 U
Di-n-butyl Phthalate	9.6 U	9.6 U

Notes:

1. Only selected compounds are reported in the table. The complete analyte list is presented in the Sampling and Analysis Plan (Appendix A) of the RI Work Plan (Hart Crowser, 2004a).
2. SVOCs = Semivolatile Organic Compounds by EPA Method 8270C.
3. µg/L = Micrograms per liter.
5. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 23A
GRAB SAMPLE CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-01	T4S1SB-02	T4S1SB-03	T4S1SB-04	T4S1SB-09	T4S1SB-10	T4S1SB-11	T4S1SB-12	T4S1SB-14	T4S1SB-15	T4S1SB-16
Sample ID:	SB01-GW-1	SB02-GW-1	SB03-GW-1	SB04-GW-1	T4S1GW-9-1	T4S1GW-10-1	T4S1GW-11-1	T4S1GW-12-1	T4S1SB-14-1	T4S1GW-15-1	T4S1GW-16-1
Date Sampled:	04/01/2004	04/01/2004	04/05/2004	04/05/2004	9/1/2004	9/8/2004	9/9/2004	9/9/2004	8/24/2004	9/7/2004	9/7/2004
VOCs (µg/L)											
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11 J	20 U	20 U	6.9 J
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.22 J	0.28 J
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U	20 U	2.3 J	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.11 J	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.46 J	0.18 J	0.34	0.51	0.25 J	0.19 J	0.35 J	0.19 J	0.50 U	0.11 J	0.18 J
Tetrachloroethene (PCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.14 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.43 J	0.27 J	0.39	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.13 J	0.50 U	0.13	0.15 J	0.50 U	0.08 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,3-Dichlorobenzene	2.7	1.4	4	2.6	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert-Butyl Ether	0.50 U	0.50 U	0.50 U	0.50 U	--	--	--	--	--	--	--

Sample Location:	T4S1SB-17	T4S1SB-18	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-25	T4S1SB-26	T4S1SB-28	T4S1SB-31	T4S1SB-32
Sample ID:	T4S1GW-17-1	T4S1GW-18-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-25-1	T4S1GW-26-1	T4S1GW-28-1	T4S1GW-31-1	T4S1GW-32-1
Date Sampled:	9/7/2004	9/3/2004	9/13/2004	9/1/2004	9/2/2004	8/27/2004	8/27/2004	8/26/2004	8/26/2004	9/8/2004	9/3/2004
VOCs (µg/L)											
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	19 J	36	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.50 U	0.50 U	0.39 J	0.93	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.17 J	0.50 U
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.1 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	6.6 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.5
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.15 J
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.50 U	0.22 J	0.50	0.50 U	0.50 U	0.22 J	0.22 J	0.11 J	0.50 U	0.50 U	0.50 U
Tetrachloroethene (PCE)	0.2 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.08 J	0.08 J	0.50 U	0.50 U	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,3-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.7	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert-Butyl Ether	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

TABLE 23A
GRAB SAMPLE CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-33	T4S1SB-34	T4S1SB-35	T4S1SB-36	T4S1SB-37	T4S1SB-38	T4S1SB-39	T4S1SB-40	T4S1SB-41	T4S1SB-42	T4S1SB-43
Sample ID:	T4S1GW-33-1	T4S1GW-34-1	T4S1GW-35-1	T4S1GW-36-1	T4S1GW-37-1	T4S1GW-38-1	T4S1GW-39-1	T4S1GW-40-1	T4S1GW-41-1	T4S1GW-42-1	T4S1GW-43-1
Date Sampled:	9/3/2004	9/1/2004	9/1/2004	9/3/2004	9/1/2004	8/31/2004	9/1/2004	8/27/2004	8/27/2004	9/7/2004	8/31/2004
VOCs (µg/L)											
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	7.5	1.8	0.50 U	0.50 U
Acetone	20 U	20 U	8.1 J	7.9 J	9 J	5.7 J	4.6 J	20 U	20 U	20 U	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.50 U	0.50 U	0.21 J	0.50 U	0.50 U	0.50 U	0.50 U	0.48 J	0.63	0.27 J	0.50 U
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.51	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.50 U	0.50 U	0.34 J	0.14 J	0.16 J	0.19 J	0.17 J	0.12 J	0.1 J	0.12 J	0.50 U
Tetrachloroethene (PCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,3-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert-Butyl Ether	--	--	--	--	--	--	--	--	--	--	--

Sample Location:	T4S1SB-44	T4S1SB-48	T4S1SB-49	T4S1SB-50	T4S1SB-82	T4S1SB-83	T4S1SB-84	T4S1SB-85	T4S1SB-86	T4S1SB-87
Sample ID:	T4S1GW-44-1	T4S1SB-48-1	T4S1SB-49-1	T4S1SB-50-1	T4S1GW-82-1	T4S1GW-83-1	T4S1GW-84-1	T4S1GW-85-1	T4S1GW-86-1	T4S1GW-87-1
Date Sampled:	8/31/2004	8/23/2004	8/23/2004	8/23/2004	9/1/2004	9/1/2004	9/9/2004	9/8/2004	9/8/2004	9/8/2004
VOCs (µg/L)										
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	20 U	20 U	20 U	20 U	20 U	57	20 U	31	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.50 U	0.50 U	0.18 J	0.23 J	0.22 J	0.18 J	0.50 U	0.50 U	0.26 J	0.29 J
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U	2.4 J	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.15 J	0.50 U	0.16 J	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.11 J	0.46 J	0.17 J	0.41 J	0.14 J
Tetrachloroethene (PCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 J	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.16 J	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.35 J	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,3-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert-Butyl Ether	--	--	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

TABLE 23A
GRAB SAMPLE CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

- Notes:**
1. Only selected compounds are reported in the table. The complete analyte list is presented in the Sampling and Analysis Plan (Appendix A) of the RI Work Plan (Hart Crowser, 2004a).
 2. VOCs = Volatile Organic Compounds by EPA Method 8260B.
 3. µg/L = Micrograms per liter.
 4. -- = Not analyzed.
 5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 23B
GRAB SAMPLE CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-05	T4S1SB-06	T4S1SB-07	T4S1SB-08	T4S1SB-51	T4S1SB-52	T4S1SB-53	T4S1SB-54	T4S1SB-55	T4S1SB-56	T4S1SB-57
Sample ID:	SB05-GW-1	SB06-GW-1	SB07-GW-1	SB08-GW-1	T4S1GW-51-1	T4S1GW-52-1	T4S1GW-53-1	T4S1GW-54-1	T4S1GW-55-1	T4S1GW-56-1	T4S1GW-57-1
Date Sampled:	03/31/2004	03/31/2004	03/30/2004	03/31/2004	9/1/2004	9/1/2004	8/30/2004	9/1/2004	8/31/2004	8/31/2004	8/31/2004
VOCs (µg/L)											
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	20 U	20 U	20 U	4.8 J	7.8 J	20 U	6.9 J	20 U	20 U	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.10 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.17 J	0.22 J	0.33 J	0.18 J
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.35 J	0.29 J	0.31 J	0.50 U	0.6	0.45 J	0.13 J	0.64	0.50 U	0.11 J	0.50 U
Tetrachloroethene (PCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.44 J	0.35 J	0.50 U	0.35	0.34 J	0.27 J	0.50 U	0.31 J	0.50 U	0.50 U	0.50 U
o-Xylene	0.12 J	0.090 J	0.50 U	0.1	0.12 J	0.11 J	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
1,3-Dichlorobenzene	2.1	1.8	0.50 U	1.5	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
Methyl tert-Butyl Ether	0.24 J	0.50 U	0.50 U	0.50 U	--	--	--	--	--	--	--

Sample Location:	T4S1SB-58	T4S1SB-59	T4S1SB-60	T4S1SB-61	T4S1SB-62	T4S1SB-63	T4S1SB-64	T4S1SB-65	T4S1SB-66	T4S1SB-67	T4S1SB-68
Sample ID:	T4S1GW-58-1	T4S1GW-59-1	T4S1GW-60-1	T4S1GW-61-1	T4S1GW-62-1	T4S1GW-63-1	T4S1GW-64-1	T4S1GW-65-1	T4S1GW-66-1	T4S1GW-67-1	T4S1GW-68-1
Date Sampled:	8/31/2004	9/9/2004	8/30/2004	9/9/2004	9/9/2004	9/9/2004	9/9/2004	8/31/2004	9/9/2004	9/8/2004	9/9/2004
VOCs (µg/L)											
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.17 J	0.16 J	0.50 U	0.31 J	0.72	0.49 J	0.50 U	0.21 J	0.50 U	0.50 U	0.2 J
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane (TCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.16 J	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.50 U	0.11 J	0.50 U	0.50 U	0.11 J	0.14 J	0.2 J	0.50 U	0.50 U	0.11 J	0.50 U
Tetrachloroethene (PCE)	0.50 U	0.16 J	0.21 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.14 J	0.50 U
m,p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.29 J	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.17 J	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.39 J	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.15 J	2.0 U
1,3-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.51 J	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.36 J	2.0 U
Methyl tert-Butyl Ether	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

TABLE 23B
GRAB SAMPLE CHEMISTRY RESULTS: VOLATILE ORGANIC COMPOUNDS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-69	T4S1SB-77	T4S1SB-78	T4S1SB-79	T4S1SB-80	T4S1SB-81
Sample ID:	T4S1GW-69-1	T4S1GW-77-1	T4S1GW-78-1	T4S1GW-79-1	T4S1GW-80-1	T4S1GW-81-1
Date Sampled:	9/9/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
VOCs (µg/L)						
Vinyl Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Acetone	20 U	20 U	20 U	20 U	20 U	20 U
1,1-Dichloroethene (1,1-DCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	0.4 J	0.50 U	0.16 J	0.2 J	0.16 J	0.41 J
trans-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane (1,1-DCA)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (MEK)	20 U	20 U	20 U	20 U	20 U	20 U
cis-1,2-Dichloroethene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	0.50 U	0.50 U	0.50 U	0.47 J	0.92	0.15 J
1,1,1-Trichloroethane (TCA)	0.50 U	0.22 J	0.12 J	0.50 U	0.13 J	0.50 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene (TCE)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.50 U	0.50 U	0.50 U	0.12 J	0.50 U	0.50 U
Tetrachloroethene (PCE)	0.50 U	1.4	0.51	0.50 U	0.50 U	0.50 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m,p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Isopropylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,3-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
n-Butylbenzene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert-Butyl Ether	--	--	--	--	--	--

- Notes:
- 1. Only selected compounds are reported in the table. The complete analyte list is presented in the Sampling and Analysis Plan (Appendix A) of the RI Work Plan (Hart Cro
 - 2. VOCs = Volatile Organic Compounds by EPA Method 8260B.
 - 3. µg/L = Micrograms per liter. |
 - 4. -- = Not analyzed.
 - 5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 - 6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 24A
GRAB SAMPLE CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-12	T4S1SB-17	T4S1SB-18	T4S1SB-19	T4S1SB-20	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-42
Sample ID:	T4S1GW-12-1	T4S1GW-17-1	T4S1GW-18-1	T4S1GW-19-1	T4S1GW-20-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-42-1
Date Sampled:	9/9/2004	9/7/2004	9/3/2004	9/9/2004	9/7/2004	9/13/2004	9/1/2004	9/2/2004	8/27/2004	9/7/2004
PCBs (µg/L)										
Aroclor 1016	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U
Aroclor 1221	0.4 U	0.39 U	0.39 U	0.42 U	0.41 U	0.39 U	0.39 U	0.38 U	0.39 U	0.39 U
Aroclor 1232	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U
Aroclor 1242	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U
Aroclor 1248	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U
Aroclor 1254	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U
Aroclor 1260	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U

Sample Location:	T4S1SB-45	T4S1SB-46	T4S1SB-47	T4S1SB-48	T4S1SB-49	T4S1SB-50	T4S1SB-82	T4S1SB-83	T4S1SB-84	T4S1SB-85
Sample ID:	T4S1SB-45-1	T4S1SB-46-1	T4S1SB-47-1	T4S1SB-48-1	T4S1SB-49-1	T4S1SB-50-1	T4S1GW-82-1	T4S1GW-83-1	T4S1GW-84-1	T4S1GW-85-1
Date Sampled:	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	9/1/2004	9/1/2004	9/9/2004	9/8/2004
PCBs (µg/L)										
Aroclor 1016	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1221	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.4 U	0.39 U
Aroclor 1232	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1242	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1248	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1254	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1260	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

- Notes:
- 1. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
 - 2. µg/L = Micrograms per liter.
 - 3. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 24B
GRAB SAMPLE CHEMISTRY RESULTS: POLYCHLORINATED BIPHENYLS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-51	T4S1SB-52	T4S1SB-63	T4S1SB-64	T4S1SB-65	T4S1SB-66	T4S1SB-67
Sample ID:	T4S1GW-51-1	T4S1GW-52-1	T4S1GW-63-1	T4S1GW-64-1	T4S1GW-65-1	T4S1GW-66-1	T4S1GW-67-1
Date Sampled:	9/1/2004	9/1/2004	9/9/2004	9/9/2004	8/31/2004	9/9/2004	9/8/2004
PCBs (µg/L)							
Aroclor 1016	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1221	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Aroclor 1232	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1242	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1248	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1254	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor 1260	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

- Notes:
- 1. PCBs = Polychlorinated Biphenyls by EPA Method 8082.
 - 2. µg/L = Micrograms per liter.
 - 3. U = The compound was analyzed for but was not detected at or above the MRL/MDL.

TABLE 25A
GRAB SAMPLE CHEMISTRY RESULTS: PESTICIDES - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location: Sample ID: Date Sampled:	Preliminary Screening Levels		T4S1SB-03	T4S1SB-04	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-25
	Fish Consumption SLV	Aquatic SLV	SB03-GW-1	SB04-GW-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-25-1
			04/05/2004	04/05/2004	9/13/2004	9/1/2004	9/2/2004	8/27/2004	8/27/2004
Pesticides/Herbicides (µg/L)									
alpha-BHC	0.0049	2.2	0.0098 U	0.0014 J	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
gamma-BHC (Lindane)	0.063	0.08	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
delta-BHC	--	--	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
Heptachlor	0.000079	0.0038 ^a .	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
Aldrin	0.00005	0.06 ^a .	0.0098 U	0.0098 U	0.0097 U	0.0096 Ui	0.0095 U	0.0096 U	0.0097 U
Heptachlor Epoxide	0.000039	0.0038 ^a .	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 Ui
Endosulfan I	89	0.056 ^a .	0.0098 Ui	0.0098 Ui	0.0097 Ui	0.0096 U	0.0095 U	0.0096 U	0.0097 U
alpha-Chlordane	0.00081	0.0043 ^a .	0.0098 U	0.0098 U	0.0097 U	0.0023 J	0.0095 U	0.0096 U	0.0097 U
Dieldrin	0.000054	0.056 ^a .	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
4,4'-DDE	0.00022	--	0.0098 U	0.0098 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U
Endrin	0.81	0.036 ^a .	0.0024 J	0.0024 J	0.0097 Ui	0.0036 JP	0.0095 U	0.0047 J	0.0097 U
Endosulfan II	89	0.056 ^a .	0.0098 U	0.0098 U	0.0097 Ui	0.0096 U	0.0095 U	0.0096 U	0.0097 Ui
4,4'-DDD	0.00031	0.001	0.0098 U	0.0098 U	0.0097 Ui	0.018	0.0095 U	0.0096 U	0.0097 U
Endrin Aldehyde	0.3	--	0.0098 U	0.0098 U	0.0097 U	0.0096 Ui	0.0095 U	0.0096 U	0.0097 U
4,4'-DDT	0.00022	0.001	0.0098 U	0.0098 Ui	0.0097 U	0.0096 U	0.0095 U	0.0096 Ui	0.0097 Ui
Endrin Ketone	--	--	0.0098 U	0.0098 U	0.0097 U	0.0096 Ui	0.0095 U	0.0096 U	0.0097 U
Methoxychlor	--	0.03	0.0098 U	0.0098 U	0.0097 Ui	0.0096 Ui	0.0095 U	0.0096 U	0.0097 U

Sample Location: Sample ID: Date Sampled:	Preliminary Screening Levels		T4S1SB-26	T4S1SB-28	T4S1SB-48	T4S1SB-49	T4S1SB-50	T4S1SB-84
	Fish Consumption SLV	Aquatic SLV	T4S1GW-26-1	T4S1GW-28-1	T4S1SB-48-1	T4S1SB-49-1	T4S1SB-50-1	T4S1GW-84-1
			8/26/2004	8/26/2004	8/23/2004	8/23/2004	8/23/2004	9/9/2004
Pesticides/Herbicides (µg/L)								
alpha-BHC	0.0049	2.2	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
gamma-BHC (Lindane)	0.063	0.08	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
delta-BHC	--	--	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Heptachlor	0.000079	0.0038 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Aldrin	0.00005	0.06 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Heptachlor Epoxide	0.000039	0.0038 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 Ui	0.01 U
Endosulfan I	89	0.056 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
alpha-Chlordane	0.00081	0.0043 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Dieldrin	0.000054	0.056 ^a .	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
4,4'-DDE	0.00022	--	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Endrin	0.81	0.036 ^a .	0.0097 U	0.0097 Ui	0.0097 U	0.0097 U	0.0098 U	0.01 U
Endosulfan II	89	0.056 ^a .	0.0097 Ui	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
4,4'-DDD	0.00031	0.001	0.0097 Ui	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U
Endrin Aldehyde	0.3	--	0.0097 U	0.011 P	0.0097 U	0.0097 U	0.0098 U	0.01 Ui
4,4'-DDT	0.00022	0.001	0.0047 JP	0.0097 Ui	0.0097 U	0.0097 Ui	0.0098 Ui	0.0054 JP
Endrin Ketone	--	--	0.0097 U	0.0097 Ui	0.0097 U	0.0097 U	0.0098 U	0.01 U
Methoxychlor	--	0.03	0.0097 Ui	0.0097 U	0.0097 U	0.0097 U	0.0098 U	0.01 U

- Notes:
1. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
 2. µg/L = Micrograms per liter.
 3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 5. i = The MRL/MDL was raised due to a chromatographic interference.
 6. P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 25 percent between the two analytical results.

TABLE 25B
GRAB SAMPLE CHEMISTRY RESULTS: PESTICIDES - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-05	T4S1SB-06	T4S1SB-61	T4S1SB-62
Sample ID:	SB05-GW-1	SB06-GW-1	T4S1GW-61-1	T4S1GW-62-1
Date Sampled:	03/31/2004	03/31/2004	9/9/2004	9/9/2004
Pesticides/Herbicides (µg/L)				
alpha-BHC	0.0098 U	0.010 U	0.0097 U	0.0097 U
gamma-BHC (Lindane)	0.0098 U	0.010 U	0.0097 U	0.0097 U
delta-BHC	0.0098 U	0.010 U	0.0097 U	0.0097 U
Heptachlor	0.0098 U	0.010 U	0.0097 U	0.0097 U
Aldrin	0.0098 U	0.010 U	0.0097 U	0.0097 U
Heptachlor Epoxide	0.0098 U	0.010 U	0.0017 JP	0.0097 U
Endosulfan I	0.0098 U	0.010 U	0.0097 U	0.0097 U
alpha-Chlordane	0.0098 U	0.010 U	0.0097 U	0.0097 U
Dieldrin	0.0098 U	0.010 U	0.0097 U	0.0097 U
4,4'-DDE	0.0098 U	0.010 U	0.0097 U	0.0097 U
Endrin	0.0098 U	0.010 U	0.0097 U	0.0097 U
Endosulfan II	0.0098 U	0.010 U	0.0097 U	0.0097 U
4,4'-DDD	0.0042 JP	0.0029 J	0.0097 Ui	0.0097 U
Endrin Aldehyde	0.0098 U	0.010 U	0.0097 U	0.0097 U
4,4'-DDT	0.0098 Ui	0.010 U	0.0037 JP	0.0028 JP
Endrin Ketone	0.0098 U	0.010 U	0.0097 U	0.0097 U
Methoxychlor	0.0098 Ui	0.010 Ui	0.0097 Ui	0.0097 U

Notes:

1. Organochlorine Pesticides by EPA Method 8081A. Organophosphorus Pesticides by EPA Method 8141A.
2. µg/L = Micrograms per liter.
3. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. i = The MRL/MDL was raised due to a chromatographic interference.
6. P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 25 percent between the two analytical results.

TABLE 26A
GRAB SAMPLE CHEMISTRY RESULTS: METALS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-12	T4S1SB-21	T4S1SB-22	T4S1SB-23	T4S1SB-24	T4S1SB-31	T4S1SB-32	T4S1SB-33
Sample ID:	T4S1GW-12-1	T4S1GW-21-1	T4S1GW-22-1	T4S1GW-23-1	T4S1GW-24-1	T4S1GW-31-1	T4S1GW-32-1	T4S1GW-33-1
Date Sampled:	9/9/2004	9/13/2004	9/1/2004	9/2/2004	8/27/2004	9/8/2004	9/3/2004	9/3/2004
Total Metals (µg/L)								
Antimony	0.09	0.18 U	0.16	0.03 B	1.35	0.02 U	0.05 U	0.1 U
Arsenic	7.4	4.4	13.9	11.8	3.5 B	36.2	4.7	4.9
Beryllium	0.62	0.129	0.388	0.023	0.13	0.811	0.177	0.069
Cadmium	0.22	0.11	0.91	0.03	0.27	0.08	0.03	0.04
Chromium	21.3	6.45	11.5	1.5	21.2	20.3	4.02	1.68
Copper	30.6	6.89	28.1	1.76	19.5	28.4	4.79	1.94
Lead	5.4	1.16	60.9	0.853	1.32	7.14	1.5	0.739
Mercury	0.2 U	0.2 U	0.13 B	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	95.2	28.1	13.3	8.14	102	25.2	7.22	4.21
Selenium	1.9 B	5 U	0.6 B	0.6 B	5 U	1.1	0.6 B	5 U
Silver	0.041	0.038 U	0.144	0.02 U	0.03	0.013 B	0.02 U	0.023 U
Thallium	0.095	0.028	0.044	0.02 U	0.052	0.082	0.017 B	0.009 B
Zinc	88.1	99	259	32.3	328	74.3	10.7	4.9
Dissolved Metals (µg/L)								
Antimony	0.26	0.17 U	0.05 U	0.02 B	1.98	0.05 U	0.05 U	0.06 U
Arsenic	4.2	3.2	8.2	11.3	2.1 B	45.3	2.4	2.8
Beryllium	0.02 U	0.02 U	0.009 B	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Cadmium	0.17	0.09	0.02 U	0.02	0.32	0.02 U	0.02 U	0.02
Chromium	0.41 U	0.59	0.97	0.86	11.2	0.32	0.26 U	0.2 U
Copper	1.29	1.44	0.45	0.44	7.94	0.31	0.68	0.3
Lead	0.03	0.833	0.05	0.02 U	0.01 B	0.02 U	0.02 U	0.02 U
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	73.2	24.9	4.27	7.98	120	3.57	3.16	2.51
Selenium	1.6 B	5 U	0.3 B	0.5 B	5 U	0.7 B	0.5 B	5 U
Silver	0.02 U	0.021	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.02 U	0.012 B	0.02 U	0.02 U	0.028	0.02 U	0.02 U	0.007 B
Zinc	22.8	63.1	2.4	30.7	345	8.2	1.4	0.9

Please refer to notes at end of table.

TABLE 26A
GRAB SAMPLE CHEMISTRY RESULTS: METALS - OU1

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-42	T4S1SB-43	T4S1SB-44	T4S1SB-84	T4S1SB-48	T4S1SB-49	T4S1SB-50
Sample ID:	T4S1GW-42-1	T4S1GW-43-1	T4S1GW-44-1	T4S1GW-84-1	T4S1SB-48-1	T4S1SB-49-1	T4S1SB-50-1
Date Sampled:	9/7/2004	8/31/2004	8/31/2004	9/9/2004	8/23/2004	8/23/2004	8/23/2004
Total Metals (µg/L)							
Antimony	0.05 U	0.12 N	0.04 B	0.17	0.05 U	0.06	0.05 U
Arsenic	0.6	19.1	5.3	9.9	1.2	1.2	0.8
Beryllium	0.009 B	0.657	0.217	1.54	0.08	0.05	0.033
Cadmium	0.02	0.07	0.03	0.45	0.02 U	0.02 U	0.02 U
Chromium	0.46	7.37	3.64	39.8	2.18	1.21	0.84
Copper	0.82	7.18	4.51	56.8	2.29	1.3	0.91
Lead	0.133	6.39	2.3	43.6	1.14	0.775	0.594
Mercury	0.2 U	0.2 U	0.2 U	0.11 B	0.2 U	0.2 U	0.2 U
Nickel	7.47	7.07	5.62	34.3	3.99	2.74	2.49
Selenium	5 U	0.8 B	0.8 B	1.4 B	0.2 B	0.3 B	0.3 B
Silver	0.02 U	0.02 U	0.02 U	0.13	0.02 U	0.009 B	0.02 U
Thallium	0.011 B	0.051	0.027	0.184	0.011 B	0.007 B	0.02 U
Zinc	2.2	11.3	10.9	107	6.6	3.5	3.1
Dissolved Metals (µg/L)							
Antimony	0.06 U	0.05 U	0.05 U	0.05 B	0.05 U	0.05 U	0.02 B
Arsenic	0.5	0.3 B	0.3 B	0.5 B	0.5	0.3 B	0.3 B
Beryllium	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Cadmium	0.03	0.02 U	0.02 U	0.03	0.02 U	0.02 U	0.02 U
Chromium	0.14 B	0.24 U	0.22 U	0.24 U	0.15 B	0.15 B	0.18 B
Copper	0.56	0.35	0.52	0.7	0.24	0.28	0.28
Lead	0.014 B	0.028 U	0.02 U	0.03	0.02 U	0.02 U	0.144
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	7.72	1.81	2.29	3.78	1.8	1.73	1.84
Selenium	5 U	1 U	0.7 B	0.3 B	1 U	0.3 B	1 U
Silver	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.013 B	0.008 B	0.02 U	0.005 B	0.02 U	0.02 U	0.02 U
Zinc	1.5	0.6	1.4	1.97	0.8	0.8	1.5

- Notes:
1. Total/Dissolved Metals using EPA 6000-7000 Series Methods.
 2. µg/L = Micrograms per liter.
 3. B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
 4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
 5. N = The matrix spike sample recovery is not within control limits. The case narrative suggests that this sample may be biased low.

TABLE 26B
GRAB SAMPLE CHEMISTRY RESULTS: METALS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-07	T4S1SB-08	T4S1SB-51	T4S1SB-52	T4S1SB-53	T4S1SB-54	T4S1SB-55	T4S1SB-56	T4S1SB-57
Sample ID:	SB07-GW-1	SB08-GW-1	T4S1GW-51-1	T4S1GW-52-1	T4S1GW-53-1	T4S1GW-54-1	T4S1GW-55-1	T4S1GW-56-1	T4S1GW-57-1
Date Sampled:	03/30/2004	03/31/2004	9/1/2004	9/1/2004	8/30/2004	9/1/2004	8/31/2004	8/31/2004	8/31/2004
Total Metals (µg/L)									
Antimony	0.056	0.018 B	1.15	5.48	0.05 U	4.37	0.05 U,N	0.05 U,N	0.05 U,N
Arsenic	0.9	15.7	8	5.5	17.9	7.2	4.3	6.3	7.7
Beryllium	0.018 B	0.01 B	0.538	0.014 B	0.03 U	0.152	0.059	0.065	0.045
Cadmium	0.011 B	0.02 U	0.08	0.06	0.03	0.04	0.06	0.02 U	0.02
Chromium	5.18	0.72	42.4	2.18	4.51	16.3	2.21	2.53	2.04
Copper	2.29	0.47 B	41.6	8.94	0.96	17.9	2.42	2.5	2.02
Lead	1.21	0.113	6.5	0.294	0.7	1.87	0.873	0.583	0.535
Mercury	0.10 U	0.10 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	4.53	1.13	93.4	73.8	8.47	45	6.45	6.73	7.02
Selenium	0.5 B	0.1 B	3.5 B	4.3 B	5 U	3.1 B	0.3 B	0.7 B	0.8 B
Silver	0.005 B	0.004 U	0.043	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.005 B	0.003 U	0.063	0.007 B	0.005 B	0.012 B	0.02 U	0.02 U	0.02 U
Zinc	16.8	3	1,040	1,520	4.5	6,730	6.1	5.7	4.7
Dissolved Metals (µg/L)									
Antimony	0.062	0.024 B	2.17	6.32	0.05 U	3.02	0.05 U	0.05 U	0.05 U
Arsenic	0.8	14.7	2.1	3.5	14.9	0.9	4.2	5.9	7.6
Beryllium	0.005 B	0.008 B	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Cadmium	0.006 U	0.006 U	0.02	0.03	0.02 U	0.03	0.02 U	0.02 U	0.02 U
Chromium	0.27	0.12 B	0.31 U	0.48	0.77	0.35 U	0.92	0.77	0.85
Copper	0.15 B	0.07 B	0.94	1.77	0.06 B	2.07	0.75	0.65	0.76
Lead	0.007 U	0.014 B	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Mercury	0.10 U	0.10 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2.93	0.85	31.6	61.7	7.47	26	5.16	5	5.66
Selenium	0.4 B	0.1 B	3.2 B	3.8 B	5 U	2.7 B	0.3 B	0.5 B	0.8 B
Silver	0.004 U	0.004 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.004 B	0.004 B	0.02 U	0.009 B	0.02 U	0.009 B	0.02 U	0.02 U	0.02 U
Zinc	3.2	1.2	153	1,680	1.7	1,120	1.3	1	1.4

Please refer to notes at end of table.

TABLE 26B
GRAB SAMPLE CHEMISTRY RESULTS: METALS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-58	T4S1SB-59	T4S1SB-60	T4S1SB-61	T4S1SB-62	T4S1SB-63	T4S1SB-64	T4S1SB-65	T4S1SB-66
Sample ID:	T4S1GW-58-1	T4S1GW-59-1	T4S1GW-60-1	T4S1GW-61-1	T4S1GW-62-1	T4S1GW-63-1	T4S1GW-64-1	T4S1GW-65-1	T4S1GW-66-1
Date Sampled:	8/31/2004	9/9/2004	8/30/2004	9/9/2004	9/9/2004	9/9/2004	9/9/2004	8/31/2004	9/9/2004
Total Metals (µg/L)									
Antimony	0.56 N	0.03 B	0.05 U	0.03 B	0.04 B	0.02 B	0.05 U	0.02 B	0.05 U
Arsenic	4	2.5	1.3	8.6	3.1	0.9	1.7	5.2	2.4
Beryllium	0.038	0.09	0.1	0.54	0.29	0.04	0.06	0.184	0.21
Cadmium	0.02	0.04	0.03	0.04	0.05	0.03	0.02 U	0.02	0.07
Chromium	1.23	1.78	2.88	9.72	5.38	1.06	1.29	2.82	5.69
Copper	1.77	3.86	2.95	9.99	6.15	1.55	1.99	3.85	10.5
Lead	0.488	1.55	1.85	4.36	2.51	1.86	1.03	1.79	3.23
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	6.01	4.62	8.35	13	9.58	4.13	4.34	4.16	8.36
Selenium	0.3 B	0.2 B	5 U	0.7 B	0.3 B	0.6 B	0.7 B	0.5 B	0.5 B
Silver	0.02 U	0.02 U	0.01 B	0.02 U	0.03	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.02 U	0.008 B	0.016 B	0.026	0.019 B	0.006 B	0.008 B	0.024	0.034
Zinc	3.1	6.04	10.7	24.8	12.6	7.44	7.45	7.6	19.9
Dissolved Metals (µg/L)									
Antimony	0.61	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Arsenic	3.9	1.5	0.2 B	1.2	0.6	0.4 B	0.3 B	1.8	1.7
Beryllium	0.02 U	0.02 U	0.02 U	0.01 B	0.04	0.02 U	0.02 U	0.02 U	0.02 U
Cadmium	0.02	0.02 U	0.02	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Chromium	0.82	0.2 U	0.65	0.3 U	0.22 U	0.2 U	0.24 U	0.2 U	0.2 U
Copper	0.72	0.67	0.3	0.8	0.58	0.65	0.68	0.34	0.25
Lead	0.117	0.05	0.02 U	0.06	0.04	0.07	0.02	0.024 U	0.02 B
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	5.8	2.91	5.78	2.59	4.14	3.38	3.07	1.83	1.28
Selenium	0.3 B	0.3 B	5 U	1 U	0.3 B	0.7 B	0.7 B	0.6 B	0.5 B
Silver	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Thallium	0.02 U	0.02 U	0.01 B	0.02 U	0.02 U	0.02 U	0.02 U	0.007 B	0.02 U
Zinc	1.5	1.72	1.7	2.59	1.3	4.06	3.28	1.8	0.85

Please refer to notes at end of table.

TABLE 26B
GRAB SAMPLE CHEMISTRY RESULTS: METALS - OU2

REMEDIAL INVESTIGATION
PORT OF PORTLAND - TERMINAL 4 SLIP 1

Sample Location:	T4S1SB-67	T4S1SB-70	T4S1SB-77	T4S1SB-78	T4S1SB-79	T4S1SB-80	T4S1SB-81
Sample ID:	T4S1GW-67-1	T4S1GW-70-3	T4S1GW-77-1	T4S1GW-78-1	T4S1GW-79-1	T4S1GW-80-1	T4S1GW-81-1
Date Sampled:	9/8/2004	8/26/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
Total Metals (µg/L)							
Antimony	0.03 B	0.05 U	0.08 U	0.06 U	0.04 B,N	0.08 U	0.5 N
Arsenic	4.6	0.5 U	1.8	1.2	1.3	2	1.5
Beryllium	0.58	0.02 U	0.23	0.07	0.112	0.16	0.173
Cadmium	0.05	0.02 U	0.06	0.02 U	0.03	0.04	0.04
Chromium	13.6	0.11 B	6.95	3.92	2.88	4.89	5.44
Copper	15.4	0.31	6.24	2.48	4.25	4.26	5.91
Lead	4.8	0.037	3.52	0.78	1.49	3.36	2.5
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	17.5	0.2 U	14.6	8.69	5.69	7.06	9.46
Selenium	0.6 B	1 U	1.1 B	2 B	0.5 B	5 U	0.4 B
Silver	0.015 B	0.02 U	0.03	0.01 B	0.02 U	0.01 B	0.02 U
Thallium	0.053	0.02 U	0.045	0.017 B	0.02 U	0.016 B	0.02 U
Zinc	44.9	0.8	21.1	9.8	7.8	12.7	15.6
Dissolved Metals (µg/L)							
Antimony	0.05 U	0.05 U	0.05 U	0.05 U	0.03 B	0.05 U	0.81
Arsenic	1.1	0.5 U	0.3 B	0.4 B	0.4 B	0.3 B	0.4 B
Beryllium	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.03
Cadmium	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.04
Chromium	0.2 U	0.08 B	0.78	1.38	0.21 U	0.93	0.44
Copper	0.49	0.06 B	0.34	0.35	0.7	0.34	0.82
Lead	0.04	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.029
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2.67	0.2 U	5.37	6.4	3.21	3	3.44
Selenium	0.4 B	1 U	1.5 B	1.9 B	0.4 B	5 U	0.4 B
Silver	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.014 B
Thallium	0.02 U	0.02 U	0.009 B	0.008 B	0.02 U	0.02 U	0.034
Zinc	2.83	0.4 B	1.1	1.4	1	1	1

Notes:

1. Total/Dissolved Metals using EPA 6000-7000 Series Methods.
2. µg/L = Micrograms per liter.
3. B = The result is an estimated concentration that is less than the MRL but greater than or equal to the method detection limit (MDL).
4. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
5. N = The matrix spike sample recovery is not within control limits. The case narrative suggests that this sample may be biased low.

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-1 (29.93)	30-Jul-93	20.95	0.00	8.98
	6-Aug-93	20.99	--	8.94*
	27-Aug-93	21.26	0.03	8.70
	15-Oct-93	--	0.01	--
	3-Dec-93	--	0.01	--
	12-Jan-94	--	0.02	--
	14-Feb-94	--	0.01	--
	11-Mar-94	--	0.00	--
	8-Apr-94	--	0.00	--
	3-May-94	--	0.05	--
	11-Jul-94	--	0.01	--
	4-Aug-94	--	0.07	--
	9-Sep-94	--	0.50	--
	7-Oct-94	--	0.07	--
	4-Nov-94	20.67	0.11	9.36
	2-Dec-94	--	0.62	--
	2-Feb-95	17.47	0.73	13.11
	2-Mar-95	--	1.71	--
	7-Apr-95	--	2.21	--
	2-May-95	19.63	2.37	12.41
	28-Jun-95	--	0.88	--
	4-Aug-95	20.60	0.80	10.04
	24-Oct-95	20.82	0.26	9.34
	14-Feb-96	10.94	0.10	19.08
	8-May-96	17.95	1.08	12.94
	28-Aug-96	18.34	2.32	13.65
	28-Apr-97	16.94	2.28	15.02
	12-May-97	19.89	3.78	13.40
	19-May-97	14.29	0.31	15.92
	27-May-97	15.03	0.05	14.94
	2-Jun-97	14.12	0.01	15.82
	23-Jun-97	14.58	0.02	15.37
	3-Jul-97	18.22	0.26	11.94
	11-Jul-97	19.11	0.36	11.14
	25-Jul-97	19.40	0.49	10.97
	8-Aug-97	19.60	0.23	10.53
	15-Aug-97	19.74	0.22	10.39
	29-Aug-97	19.95	0.24	10.19
	5-Sep-97	20.07	0.15	9.99
	15-Sep-97	20.21	0.12	9.83
	3-Oct-97	19.81	0.07	10.18
	13-Oct-97	19.62	0.03	10.34
	16-Nov-98	19.46	0.22	10.67
	18-Feb-99	23.35	5.54	11.51
	19-May-99	Converted to IA Extraction Well		

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-2 (30.05)	12-May-97	17.17	0.70	13.50
	19-May-97	14.31	0.00	15.74
	27-May-97	15.02	0.00	15.03
	2-Jun-97	14.44	0.00	15.61
	23-Jun-97	14.65	0.03	15.43
	3-Jul-97	18.15	0.60	12.43
	11-Jul-97	18.76	0.62	11.84
	25-Jul-97	19.19	0.88	11.64
	8-Aug-97	19.49	0.70	11.18
	15-Aug-97	19.26	0.29	11.05
	29-Aug-97	19.61	0.46	10.85
	5-Sep-97	19.53	0.18	10.68
	15-Sep-97	19.77	0.24	10.49
	3-Oct-97	19.59	0.38	10.80
	13-Oct-97	19.63	0.60	10.95
	16-Nov-98	20.47	0.66	10.17
	18-Feb-99	19.50	2.05	12.37
	19-May-99	Converted to IA Extraction Well		
MW-3 (30.09)	30-Jul-93	21.00	1.69	10.59
	6-Aug-93	18.78	--	11.31*
	27-Aug-93	21.19	0.06	8.95
	15-Oct-93	--	0.15	--
	3-Dec-93	--	0.02	--
	12-Jan-94	--	0.98	--
	14-Feb-94	--	0.15	--
	11-Mar-94	--	0.35	--
	8-Apr-94	--	0.30	--
	3-May-94	--	0.26	--
	11-Jul-94	--	0.11	--
	4-Aug-94	--	0.18	--
	9-Sep-94	--	0.08	--
	7-Oct-94	--	0.60	--
	4-Nov-94	20.05	1.90	11.73
	2-Dec-94	--	1.30	--
	2-Feb-95	17.44	4.54	16.69
	2-Mar-95	--	2.75	--
	7-Apr-95	--	4.52	--
	2-May-95	19.25	4.84	15.15
	28-Jun-95	--	3.90	--
	4-Aug-95	20.84	0.80	9.96
	24-Oct-95	20.15	0.83	10.68
	8-May-96	16.77	1.95	15.05

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-3 (cont.) (30.09)	28-Apr-97	15.11	0.36	15.30
	12-May-97	16.37	0.62	14.27
	19-May-97	14.45	0.00	15.64
	27-May-97	14.76	0.01	15.34
	2-Jun-97	14.62	0.01	15.48
	11-Jul-97	17.42	0.05	12.71
	25-Jul-97	17.94	0.00	12.15
	8-Aug-97	18.06	0.01	12.04
	15-Aug-97	18.23	0.02	11.88
	29-Aug-97	18.50	0.01	11.60
	5-Sep-97	18.72	0.00	11.37
	15-Sep-97	18.91	0.00	11.18
	3-Oct-97	18.69	0.00	11.40
	13-Oct-97	18.66	0.00	11.43
	16-Nov-98	19.87	0.46	10.63
	18-Feb-99	16.14	0.19	14.12
	19-May-99	Converted to IA Extraction Well		
MW-4 (33.03)	30-Jul-93	17.28	--	15.75
	6-Aug-93	17.32	--	15.71
	27-Aug-93	17.50	--	15.53
	12-May-97	15.59	0.00	17.44
	27-May-97	15.71	0.00	17.32
	2-Jun-97	15.72	0.00	17.31
	11-Jul-97	15.73	0.00	17.30
	15-Aug-97	16.08	0.00	16.95
	15-Sep-97	16.41	0.00	16.62
	3-Oct-97	16.67	0.00	16.36
	16-Nov-98	17.49	0.00	15.54
	18-Feb-99	15.21	0.00	17.82
	24-May-99	16.05	0.00	16.98
	25-Aug-99	16.96	0.00	16.07
MW-5 (33.79)	9-Nov-99	17.16	0.00	15.87
	30-Jul-93	17.92	--	15.87
	6-Aug-93	17.97	--	15.82
	27-Aug-93	18.16	--	15.63
	4-Nov-94	18.84	--	14.95
	2-Feb-95	17.27	--	16.52
	2-May-95	17.09	--	16.70
	4-Aug-95	17.83	--	15.96
	24-Oct-95	18.35	--	15.44
	14-Feb-96	15.40	--	18.39
	8-May-96	15.95	--	17.84
	28-Aug-96	17.10	--	16.69

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-5 (cont.) (33.79)	28-Apr-97	16.24	0.00	17.55
	12-May-97	16.38	0.00	17.41
	27-May-97	16.51	0.00	17.28
	2-Jun-97	16.51	0.00	17.28
	11-Jul-97	16.54	0.00	17.25
	15-Aug-97	16.84	0.00	16.95
	15-Sep-97	17.19	0.00	16.60
	3-Oct-97	17.40	0.00	16.39
	16-Nov-98	18.20	0.00	15.59
	18-Feb-99	16.18	0.00	17.61
	24-May-99	16.81	0.00	16.98
	25-Aug-99	17.70	0.00	16.09
	9-Nov-99	18.09	0.00	15.70
MW-6 (34.27)	30-Jul-93	18.34	--	15.93
	6-Aug-93	18.39	--	15.88
	27-Aug-93	18.58	--	15.69
	4-Nov-94	18.43	--	15.84
	2-Feb-95	17.15	--	17.12
	2-May-95	17.15	--	17.12
	4-Aug-95	18.21	--	16.06
	24-Oct-95	18.63	--	15.64
	14-Feb-96	15.82	--	18.45
	8-May-96	16.23	--	18.04
	28-Aug-96	17.53	--	16.74
	12-May-97	16.70	0.00	17.57
	27-May-97	16.86	0.00	17.41
	2-Jun-97	16.57	0.00	17.70
	11-Jul-97	16.90	0.00	17.37
	15-Aug-97	17.25	0.00	17.02
	15-Sep-97	17.58	0.00	16.69
	3-Oct-97	17.38	0.00	16.89
	16-Nov-98	17.65	0.00	16.62
	18-Feb-99	16.09	0.00	18.18
	24-May-99	17.03	0.00	17.24
	25-Aug-99	18.00	0.00	16.27
	9-Nov-99	18.18	0.00	16.09
MW-7 (35.83)	30-Jul-93	19.84	--	15.99
	6-Aug-93	19.89	--	15.94
	27-Aug-93	20.09	--	15.74
	4-Nov-94	19.29	--	16.54
	2-Feb-95	18.51	--	17.32
	2-May-95	18.80	--	17.03
	4-Aug-95	19.77	--	16.06
	24-Oct-95	20.23	--	15.60

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-7 (cont.) (35.83)	14-Feb-96	17.15	--	18.68
	8-May-96	17.87	--	17.96
	28-Aug-96	19.07	--	16.76
	28-Apr-97	18.11	0.00	17.72
	12-May-97	18.24	0.00	17.59
	27-May-97	18.42	0.00	17.41
	2-Jun-97	18.37	0.00	17.46
	11-Jul-97	18.45	0.00	17.38
	15-Aug-97	18.80	0.00	17.03
	15-Sep-97	19.13	0.00	16.70
	3-Oct-97	19.27	0.00	16.56
	16-Nov-98	20.01	0.00	15.82
	18-Feb-99	17.79	0.00	18.04
	24-May-99	16.79	0.00	19.04
	25-Aug-99	19.55	0.00	16.28
	9-Nov-99	18.01	0.00	17.82
MW-8 (31.13)	30-Jul-93	--	0.00	--
	6-Aug-93	19.63	--	11.50
	27-Aug-93	20.09	0.00	11.04
	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.00	--
	12-Jan-94	--	0.00	--
	14-Feb-94	--	0.00	--
	11-Mar-94	--	0.00	--
	8-Apr-94	--	0.00	--
	3-May-94	--	0.00	--
	11-Jul-94	--	0.00	--
	4-Aug-94	--	0.00	--
	9-Sep-94	--	0.00	--
	7-Oct-94	--	0.00	--
	4-Nov-94	21.54	0.00	9.59
	2-Dec-94	--	0.00	--
	2-Feb-95	18.55	0.00	12.58
	2-Mar-95	--	0.00	--
	7-Apr-95	--	0.00	--
	2-May-95	18.28	0.00	12.85
	28-Jun-95	--	0.00	--
	4-Aug-95	19.39	0.00	11.74
	24-Oct-95	20.49	0.00	10.64
	14-Feb-96	11.79	Trace	19.34
	8-May-96	15.36	0.01	15.78
	28-Aug-96	18.45	0.01	12.69
	12-May-97	15.40	0.00	15.73
	27-May-97	15.07	0.00	16.06

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-8 (cont.) (31.13)	2-Jun-97	15.80	0.00	15.33
	11-Jul-97	15.62	0.00	15.51
	15-Aug-97	17.24	0.00	13.89
	15-Sep-97	18.54	0.00	12.59
	3-Oct-97	18.63	0.00	12.50
	16-Nov-98	20.19	Trace	10.94
	18-Feb-99	16.61	0.00	14.52
	24-May-99	17.08	0.36	14.37
	26-Aug-99	22.50	3.60	11.83
	9-Nov-99	17.82	0.29	13.57
MW-9 (31.42)	30-Jul-93	16.72	--	14.70
	6-Aug-93	16.75	--	14.67
	27-Aug-93	16.86	--	14.56
	4-Nov-94	17.46	--	13.96
	2-Feb-95	16.57	--	14.85
	2-May-95	16.16	--	15.26
	4-Aug-95	16.59	--	14.83
	24-Oct-95	16.93	--	14.49
	14-Feb-96	13.21	--	18.21
	8-May-96	15.02	--	16.40
	28-Aug-96	15.96	--	15.46
	28-Apr-97	15.19	0.00	16.23
	12-May-97	15.25	0.00	16.17
	27-May-97	15.10	0.00	16.32
	2-Jun-97	15.12	0.00	16.30
	11-Jul-97	15.13	0.00	16.29
	15-Aug-97	15.63	0.00	15.79
	15-Sep-97	15.95	0.00	15.47
	3-Oct-97	16.15	0.00	15.27
	16-Nov-98	19.34	0.00	12.08
	18-Feb-99	15.75	0.00	15.67
	24-May-99	15.87	0.00	15.55
	26-Aug-99	16.45	0.00	14.97
	9-Nov-99	17.22	0.00	14.20
MW-10 (30.18)	30-Jul-93	17.76	--	12.42
	6-Aug-93	17.65	--	12.53
	27-Aug-93	18.28	--	11.90
	4-Nov-94	20.44	--	9.74
	2-Feb-95	16.41	--	13.77
	2-May-95	16.06	--	14.12
	4-Aug-95	17.92	--	12.26
	24-Oct-95	19.23	--	10.95
	14-Feb-96	10.75	--	19.43
	8-May-96	13.61	--	16.57
	28-Aug-96	16.18	--	14.00

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-10 (cont.) (30.18)	28-Apr-97	13.93	0.00	16.25
	12-May-97	13.99	0.00	16.19
	27-May-97	13.83	0.00	16.35
	2-Jun-97	13.84	0.00	16.34
	11-Jul-97	14.06	0.00	16.12
	15-Aug-97	14.80	0.00	15.38
	15-Sep-97	15.86	0.00	14.32
	3-Oct-97	16.14	0.00	14.04
	16-Nov-98	18.36	0.00	11.82
	18-Feb-99	14.32	0.00	15.86
	24-May-99	15.92	0.00	14.26
	25-Aug-99	17.43	0.00	12.75
	9-Nov-99	18.99	0.00	11.19
MW-11 (33.16)	30-Jul-93	17.49	--	15.67
	6-Aug-93	17.51	--	15.65
	27-Aug-93	17.67	--	15.49
	4-Nov-94	18.29	--	14.87
	2-Feb-95	17.04	--	16.12
	2-May-95	16.68	--	16.48
	4-Aug-95	17.34	--	15.82
	24-Oct-95	17.82	--	15.34
	14-Feb-96	15.40	--	17.76
	8-May-96	15.54	--	17.62
	28-Aug-96	16.63	--	16.53
	12-May-97	15.93	0.00	17.23
	27-May-97	16.05	0.00	17.11
	2-Jun-97	16.01	0.00	17.15
	11-Jul-97	16.03	0.00	17.13
	15-Aug-97	16.35	0.00	16.81
	15-Sep-97	16.67	0.00	16.49
	3-Oct-97	16.90	0.00	16.26
	16-Nov-98	17.56	0.00	15.60
	18-Feb-99	16.05	0.00	17.11
MW-12 (31.90)	24-May-99	16.22	0.00	16.94
	25-Aug-99	17.10	0.00	16.06
	9-Nov-99	18.23	0.00	14.93
	30-Jul-93	16.41	--	15.49
	6-Aug-93	16.43	--	15.47
	27-Aug-93	16.62	--	15.28
	4-Nov-94	17.23	--	14.67
	2-Feb-95	15.99	--	15.91
	2-May-95	15.60	--	16.30
	4-Aug-95	16.29	--	15.61
	24-Oct-95	16.77	--	15.13

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-12 (cont.) (31.90)	14-Feb-96	15.58	--	16.32
	8-May-96	14.38	--	17.52
	28-Aug-96	15.57	--	16.33
	28-Apr-97	14.65	0.00	17.25
	12-May-97	14.76	0.00	17.14
	27-May-97	14.87	0.00	17.03
	2-Jun-97	14.79	0.00	17.11
	11-Jul-97	14.84	0.00	17.06
	15-Aug-97	15.20	0.00	16.70
	15-Sep-97	15.57	0.00	16.33
	3-Oct-97	15.79	0.00	16.11
	16-Nov-98	16.55	0.00	15.35
	18-Feb-99	15.09	0.00	16.81
	24-May-99	15.25	0.00	16.65
	25-Aug-99	16.00	0.00	15.90
	9-Nov-99	18.46	0.00	13.44
MW-13 (31.49)	30-Jul-93	18.45	--	13.04
	6-Aug-93	18.33	--	13.16
	27-Aug-93	18.85	--	12.64
	4-Nov-94	20.45	--	11.04
	2-Feb-95	17.44	--	14.05
	2-May-95	17.05	--	14.44
	4-Aug-95	18.16	--	13.33
	24-Oct-95	19.27	--	12.22
	14-Feb-96	14.32	--	17.17
	8-May-96	13.95	--	17.54
	28-Aug-96	15.54	--	15.95
	16-Nov-98	17.99	0.00	13.50
	18-Feb-99	15.15	0.00	16.34
	24-May-99	16.01	0.00	15.48
	25-Aug-99	17.65	0.00	13.84
	9-Nov-99	18.79	0.00	12.70
MW-14 (31.32)	30-Jul-93	19.57	0.00	11.75
	6-Aug-93	19.40	--	11.92
	27-Aug-93	19.89	0.00	11.43
	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.00	--
	12-Jan-94	--	0.00	--
	14-Feb-94	--	0.00	--
	11-Mar-94	--	0.00	--
	8-Apr-94	--	0.00	--
	3-May-94	--	0.00	--
	11-Jul-94	--	0.00	--

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-14 (cont.) (31.32)	4-Aug-94	--	0.00	--
	9-Sep-94	--	0.00	--
	7-Oct-94	--	0.00	--
	4-Nov-94	21.46	0.00	9.86
	2-Dec-94	--	0.00	--
	2-Feb-95	18.33	Trace	12.99
	2-Mar-95	--	0.90	--
	7-Apr-95	--	Trace	--
	2-May-95	14.26	4.50	21.07
	28-Jun-95	--	0.70	--
	4-Aug-95	16.98	3.24	17.22
	24-Oct-95	20.37	0.21	11.14
	14-Feb-96	13.29	0.17	18.18
	8-May-96	16.98	1.96	16.08
	28-Apr-97	18.93	3.92	15.88
	12-May-97	19.51	4.01	15.38
	19-May-97	16.53	1.60	16.21
	27-May-97	15.91	0.93	16.24
	23-Jun-97	15.04	0.47	16.70
	3-Jul-97	15.47	0.31	16.13
	11-Jul-97	15.71	0.13	15.73
	25-Jul-97	16.24	0.29	15.34
	8-Aug-97	16.90	0.36	14.74
	15-Aug-97	16.94	0.06	14.43
	29-Aug-97	17.49	0.03	13.86
	5-Sep-97	17.91	0.17	13.56
	15-Sep-97	18.51	0.26	13.04
	3-Oct-97	18.80	0.42	12.89
	13-Oct-97	19.04	0.60	12.81
	16-Nov-98	23.89	4.69	11.60
	18-Feb-99	19.08	3.03	14.94
	24-May-99	19.67	1.43	12.92
	25-Aug-99	21.50	2.85	12.36
	9-Nov-99	20.87	1.67	11.94
MW-15 (31.57)	30-Jul-93	20.03	1.68	13.04
	6-Aug-93	18.33	--	13.24*
	27-Aug-93	18.90	2.90	15.25
	15-Oct-93	--	2.10	--
	3-Dec-93	--	1.50	--
	12-Jan-94	--	1.53	--
	14-Feb-94	--	0.00	--
	11-Mar-94	--	0.00	--
	8-Apr-94	--	0.00	--
	3-May-94	--	3.42	--

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-15 (cont.) (31.57)	11-Jul-94	--	1.19	--
	4-Aug-94	--	0.73	--
	9-Sep-94	--	0.50	--
	7-Oct-94	--	0.50	--
	4-Nov-94	20.79	0.92	11.60
	2-Dec-94	--	1.37	--
	2-Feb-95	16.72	6.33	20.48
	2-Mar-95	--	6.30	--
	7-Apr-95	--	6.25	--
	2-May-95	16.51	5.62	20.06
	28-Jun-95	--	6.23	--
	4-Aug-95	18.00	4.39	17.48
	24-Oct-95	19.93	1.51	12.98
	14-Feb-96	13.85	0.38	18.06
	8-May-96	14.34	0.20	17.41
	28-Aug-96	15.90	0.61	16.21
	28-Apr-97	15.73	1.25	16.95
	12-May-97	15.75	1.11	16.81
	19-May-97	15.20	0.53	16.84
	27-May-97	14.90	0.17	16.82
	2-Jun-97	14.70	0.02	16.89
	23-Jun-97	14.62	0.01	16.96
	3-Jul-97	14.77	0.01	16.81
	11-Jul-97	15.01	0.03	16.59
	25-Jul-97	15.24	0.00	16.33
	8-Aug-97	15.31	0.01	16.27
	15-Aug-97	15.38	0.00	16.19
	29-Aug-97	15.82	0.08	15.82
	5-Sep-97	16.22	0.53	15.82
	15-Sep-97	16.76	0.87	15.58
	3-Oct-97	17.23	1.21	15.42
	13-Oct-97	17.20	1.17	15.41
	16-Nov-98	19.29	2.07	14.12
	18-Feb-99	17.23	2.72	16.76
	24-May-99	16.06	0.79	16.21
	25-Aug-99	20.50	4.28	14.88
	9-Nov-99	18.10	1.01	14.37
MW-16 (31.24)	30-Jul-93	21.02	0.00	10.22
	6-Aug-93	20.89	--	10.35*
	27-Aug-93	20.25	0.00	10.99
	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.00	--
	12-Jan-94	--	0.00	--
	14-Feb-94	--	0.00	--

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-16 (cont.) (31.24)	11-Mar-94	--	0.57	--
	8-Apr-94	--	0.15	--
	3-May-94	--	0.25	--
	11-Jul-94	--	0.00	--
	4-Aug-94	--	0.00	--
	9-Sep-94	--	0.00	--
	7-Oct-94	--	0.00	--
	4-Nov-94	19.98	0.01	11.27
	2-Dec-94	--	0.12	--
	2-Feb-95	17.57	0.04	13.71
	2-Mar-95	--	0.22	--
	7-Apr-95	--	5.04	--
	2-May-95	18.34	5.29	17.61
	28-Jun-95	--	1.80	--
	4-Aug-95	18.53	0.80	13.42
	24-Oct-95	18.22	0.17	13.17
	14-Feb-96	12.04	0.00	19.20
	8-May-96	16.64	0.01	14.61
	28-Aug-96	17.44	0.46	14.21
	28-Apr-97	15.86	0.07	15.44
	12-May-97	16.67	0.03	14.60
	19-May-97	15.56	0.00	15.68
	27-May-97	15.73	0.00	15.51
	2-Jun-97	15.61	0.00	15.63
	23-Jun-97	15.11	0.00	16.13
	3-Jul-97	16.63	0.01	14.62
	11-Jul-97	17.12	0.01	14.13
	25-Jul-97	17.50	0.00	13.74
	8-Aug-97	17.81	0.01	13.44
	15-Aug-97	17.82	0.00	13.42
	29-Aug-97	17.72	0.00	13.52
	5-Sep-97	17.68	0.00	13.56
	15-Sep-97	17.59	0.00	13.65
	3-Oct-97	17.44	0.00	13.80
	13-Oct-97	17.44	0.00	13.80
	16-Nov-98	18.29	0.00	12.95
	18-Feb-99	15.01	0.00	16.23
	24-May-99	18.11	0.34	13.43
	26-Aug-99	18.80	0.35	12.75
	9-Nov-99	18.85	0.14	12.51
MW-17 (28.40)	30-Jul-93	15.62	0.00	12.78
	30-Jul-93	--	0.00	--
	6-Aug-93	15.66	--	12.74*
	27-Aug-93	15.98	0.00	12.42

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-17(cont.) (28.40)	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.00	--
	12-Jan-94	--	0.04	--
	14-Feb-94	--	0.00	--
	11-Mar-94	--	0.02	--
	8-Apr-94	--	0.01	--
	3-May-94	--	0.00	--
	11-Jul-94	--	0.00	--
	4-Aug-94	--	0.01	--
	9-Sep-94	--	0.00	--
	7-Oct-94	--	0.00	--
	4-Nov-94	16.13	0.07	12.33
	2-Dec-94	--	0.01	--
	2-Mar-95	--	2.61	--
	7-Apr-95	--	1.83	--
	2-May-95	14.38	2.03	15.83
	28-Jun-95	--	0.78	--
	4-Aug-95	15.57	0.90	13.63
	24-Oct-95	16.49	0.44	12.30
	14-Feb-96	9.43	0.99	19.85
	8-May-96	12.10	0.87	17.07
	28-Aug-96	13.92	0.67	15.08
	28-Apr-97	13.58	1.37	16.04
	12-May-97	13.44	1.18	16.01
	19-May-97	12.56	0.42	16.21
	27-May-97	12.39	0.17	16.16
	2-Jun-97	12.12	0.01	16.29
	23-Jun-97	11.68	0.01	16.73
	3-Jul-97	12.17	0.00	16.23
	11-Jul-97	12.51	0.01	15.90
	8-Aug-97	13.49	0.00	14.91
	15-Aug-97	13.66	0.00	14.74
	29-Aug-97	14.03	0.01	14.38
	5-Sep-97	14.27	0.00	14.13
	15-Sep-97	14.57	0.00	13.83
	3-Oct-97	14.77	0.00	13.63
	13-Oct-97	14.72	0.00	13.68
	25-Jul-97	12.94	0.07	15.52
	16-Nov-98	16.80	0.13	11.72
	18-Feb-99	14.70	1.75	15.26
	24-May-99	16.00	2.31	14.46
	26-Aug-99	18.75	3.25	12.54
	9-Nov-99	16.77	2.01	13.42

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-18 (31.25)	30-Jul-93	18.59	--	12.66
	6-Aug-93	18.44	--	12.81
	27-Aug-93	18.89	--	12.36
	4-Nov-94	20.41	--	10.84
	2-Feb-95	17.73	--	13.52
	4-Nov-94	20.41	--	10.84
	2-Feb-95	17.73	--	13.52
	2-May-95	17.16	--	14.09
	4-Aug-95	18.20	--	13.05
	24-Oct-95	19.20	--	12.05
	14-Feb-96	17.46	--	13.79
	8-May-96	13.86	--	17.39
	28-Aug-96	17.19	--	14.06
	28-Apr-97	14.18	0.00	17.07
	12-May-97	14.27	0.00	16.98
	27-May-97	14.33	0.00	16.92
	2-Jun-97	14.28	0.00	16.97
	11-Jul-97	14.37	0.00	16.88
	15-Aug-97	15.72	0.00	15.53
	15-Sep-97	17.45	0.00	13.80
	3-Oct-97	17.66	0.00	13.59
	16-Nov-98	19.62	0.00	11.63
	18-Feb-99	15.53	0.00	15.72
	24-May-99	15.50	0.00	15.75
	25-Aug-99	17.80	0.00	13.45
	9-Nov-99	16.44	0.00	14.81
MW-19 (30.73)	30-Jul-93	18.45	0.00	12.28
	6-Aug-93	18.36	--	12.37*
	27-Aug-93	18.87	0.00	11.86
	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.00	--
	12-Jan-94	--	0.01	--
	14-Feb-94	--	0.00	--
	11-Mar-94	--	0.00	--
	8-Apr-94	--	0.00	--
	3-May-94	--	0.00	--
	11-Jul-94	--	0.00	--
	4-Aug-94	--	0.00	--
	9-Sep-94	--	0.15	--
	7-Oct-94	--	2.73	--
	4-Nov-94	20.23	8.70	18.24
	2-Dec-94	--	1.28	--
	2-Feb-95	17.27	8.90	21.38
	2-Mar-95	--	13.11	--

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-19 (cont.) (30.73)	7-Apr-95	--	13.38	--
	2-May-95	16.52	12.87	25.66
	28-Jun-95	--	8.29	--
	4-Aug-95	18.29	3.24	15.32
	24-Oct-95	19.54	0.23	11.39
	14-Feb-96	12.80	0.08	18.00
	8-May-96	13.95	0.58	17.30
	28-Aug-96	15.83	1.15	15.92
	28-Apr-97	17.23	3.25	16.39
	12-May-97	17.39	3.33	16.30
	19-May-97	14.95	0.84	16.53
	27-May-97	14.61	0.42	16.49
	2-Jun-97	14.15	0.01	16.59
	23-Jun-97	14.11	0.20	16.80
	3-Jul-97	14.31	0.15	16.55
	11-Jul-97	14.89	0.50	16.29
	25-Jul-97	17.45	2.90	15.86
	8-Aug-97	17.96	3.05	15.48
	15-Aug-97	16.46	1.10	15.25
	29-Aug-97	16.91	0.77	14.51
	5-Sep-97	16.82	0.31	14.19
	15-Sep-97	17.20	0.10	13.62
	3-Oct-97	17.39	0.09	13.42
	13-Oct-97	17.49	0.09	13.32
	16-Nov-98	19.55	1.43	12.45
	18-Feb-99	21.53	7.00	15.43
	24-May-99	21.77	3.86	12.40
	25-Aug-99	27.90	11.20	12.80
	9-Nov-99	24.54	4.12	9.86
MW-20 (30.73)	30-Jul-93	19.04	0.00	11.69
	6-Aug-93	18.89	--	11.84*
	27-Aug-93	19.35	0.00	11.38
	15-Oct-93	--	0.00	--
	3-Dec-93	--	0.58	--
	12-Jan-94	--	1.04	--
	14-Feb-94	--	0.57	--
	11-Mar-94	--	1.20	--
	8-Apr-94	--	0.98	--
	3-May-94	--	0.67	--
	11-Jul-94	--	0.43	--
	4-Aug-94	--	0.55	--
	9-Sep-94	--	0.82	--
	7-Oct-94	--	0.60	--
	4-Nov-94	20.94	0.37	10.12
	2-Dec-94	--	0.90	--

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
MW-20 (cont.) (30.73)	2-Feb-95	17.66	4.00	16.63
	2-Mar-95	--	5.21	--
	7-Apr-95	--	5.05	--
	2-May-95	17.40	4.48	17.32
	28-Jun-95	--	3.95	--
	4-Aug-95	18.74	1.98	13.75
	24-Oct-95	19.90	0.77	11.52
	14-Feb-96	10.66	1.14	21.08
	8-May-96	14.59	1.26	17.26
	28-Aug-96	15.73	2.05	16.82
	28-Apr-97	16.61	2.21	16.09
	12-May-97	16.54	2.01	15.98
	19-May-97	14.90	0.45	16.23
	27-May-97	14.73	0.28	16.25
	2-Jun-97	14.53	0.02	16.22
	23-Jun-97	14.06	0.00	16.67
	3-Jul-97	14.63	0.00	16.10
	11-Jul-97	15.01	0.00	15.72
	25-Jul-97	15.55	0.00	15.18
	8-Aug-97	17.11	1.28	14.76
	15-Aug-97	17.04	0.79	14.39
	29-Aug-97	17.67	0.80	13.77
	5-Sep-97	17.72	0.50	13.46
	15-Sep-97	18.31	0.57	12.93
	3-Oct-97	18.27	0.44	12.85
	13-Oct-97	18.39	0.50	12.79
	16-Nov-98	19.70	0.29	11.29
	18-Feb-99	20.77	5.77	15.10
	24-May-99	21.54	4.17	12.90
	26-Aug-99	20.50	2.40	12.37
	9-Nov-99	24.33	4.20	10.14
HC-1 (31.95)	16-Nov-98	28.95	0.00	3.00
	18-Feb-99	24.05	0.00	7.90
	24-May-99	23.91	0.00	8.04
	25-Aug-99	27.70	0.00	4.25
	9-Nov-99	28.42	0.00	3.53
HC-2 (31.78)	16-Nov-98	29.60	0.00	2.18
	18-Feb-99	22.36	0.00	9.42
	24-May-99	23.77	0.00	8.01
	25-Aug-99	27.35	0.00	4.43
	9-Nov-99	28.47	0.00	3.31

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
HC-3 (32.47)	16-Nov-98	30.37	0.00	2.10
	18-Feb-99	23.37	0.00	9.10
	24-May-99	23.66	0.00	8.81
	25-Aug-99	28.10	0.00	4.37
	9-Nov-99	29.37	0.00	3.10
HC-4S (31.94)	16-Nov-98	Dry	--	--
	18-Feb-99	Dry	--	--
	24-May-99	23.95	0.00	7.99
	25-Aug-99	Dry	--	--
	9-Nov-99	24.48	0.00	7.46
HC-4D (31.77)	16-Nov-98	28.98	0.00	2.79
	18-Feb-99	22.11	0.00	9.66
	24-May-99	23.04	0.00	8.73
	25-Aug-99	26.80	0.00	4.97
	9-Nov-99	30.00	0.00	1.77
HC-5 (31.69)	16-Nov-98	18.88	0.00	12.81
	18-Feb-99	17.32	0.00	14.37
	24-May-99	18.03	0.00	13.66
	25-Aug-99	18.54	0.00	13.15
	9-Nov-99	18.00	0.00	13.69
HC-6S (32.62)	16-Nov-98	Dry	--	--
	18-Feb-99	18.05	0.00	14.57
	24-May-99	18.23	0.00	14.39
	25-Aug-99	18.67	0.00	13.95
	9-Nov-99	19.12	0.00	13.50
HC-6D (32.48)	16-Nov-98	19.90	0.00	12.58
	18-Feb-99	20.62	0.00	11.86
	24-May-99	23.99	0.00	8.49
	25-Aug-99	21.51	0.00	10.97
	9-Nov-99	22.39	0.00	10.09
HC-7 (32.57)	16-Nov-98	19.99	0.00	12.58
	18-Feb-99	16.09	0.00	16.48
	24-May-99	16.16	0.00	16.41
	25-Aug-99	16.71	0.00	15.86
	9-Nov-99	17.33	0.00	15.24
HC-8 (36.53)	16-Nov-98	Dry	--	--
	18-Feb-99	27.31	0.00	9.22
	24-May-99	25.99	0.00	10.54
	25-Aug-99	27.61	0.00	8.92
	9-Nov-99	29.88	0.00	6.65
HC-9 (29.51)	16-Nov-98	16.14	0.00	13.37
	18-Feb-99	13.58	0.00	15.93
	24-May-99	14.63	0.00	14.88

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

**Table 4 - Groundwater Elevations and Free Product Thickness
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Monitoring Well (Elevation)	Measurement Date	Depth to Water in Feet	Product Thickness in Feet	Groundwater Elevations in Feet
HC-9 (cont.) (29.51)	25-Aug-99	15.26	0.00	14.25
	9-Nov-99	17.01	0.00	12.50
HC-10 (29.30)	16-Nov-98	18.18	0.00	11.12
	18-Feb-99	14.72	0.00	14.58
	24-May-99	15.91	0.88	14.17
	26-Aug-99	17.95	1.05	12.28
	9-Nov-99	17.45	0.54	12.33
HC-11 (30.20)	16-Nov-98	17.55	0.00	12.65
	18-Feb-99	14.79	0.00	15.41
	24-May-99	15.33	0.00	14.87
	25-Aug-99	16.84	0.00	13.36
	9-Nov-99	17.64	0.00	12.56
HC-12S (29.19)	16-Nov-98	Dry	--	--
	18-Feb-99	13.33	0.00	15.86
	24-May-99	13.88	0.00	15.31
	25-Aug-99	Dry	--	--
	9-Nov-99	13.44	0.00	15.75
HC-12D (28.91)	16-Nov-98	18.26	0.00	10.65
	18-Feb-99	14.51	0.00	14.40
	24-May-99	15.02	0.00	13.89
	25-Aug-99	16.99	0.00	11.92
	9-Nov-99	18.22	0.00	10.69
HC-13 (30.59)	16-Nov-98	18.19	0.00	12.40
	18-Feb-99	16.88	0.00	13.71
	24-May-99	16.71	0.00	13.88
	25-Aug-99	17.00	0.00	13.59
	9-Nov-99	17.39	0.00	13.20
HC-14 (36.99)	16-Nov-98	Dry	--	--
	18-Feb-99	Dry	--	--
	24-May-99	Dry	--	--
	25-Aug-99	Dry	--	--
	9-Nov-99	26.91	0.00	10.08

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

Explanatory Notes:

1. Monitoring well elevations are from top of casing referenced to Columbia River Datum. Elevation data from Century West (1994) and Crane & Merseth (1998).
2. Free product thickness as measured in the monitoring well. The thickness in the well is typically greater than the thickness in formation due to capillary effects of the soil.
3. Groundwater elevations are referenced to Columbia River Datum; elevations corrected (Sg = 0.89 assumed) if free product is present.
4. -- = Data not available or applicable.
5. * Free product may have been present, thus calculated groundwater elevation may be incorrect.
6. Sources: 1993 through 1996 data from Century West (1994, 1996); most 1997 data from PEG (1997c); and April 28, 1997, and 1998-1999 data from Hart Crowser.

Table 5 - Groundwater Chemical Analyses Results: TPH
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Location	Sampling Date	Total Petroleum Hydrocarbons			
		Gasoline	Diesel	Oil	418.1
Monitoring Wells		Concentrations in milligrams per Liter (mg/L)			
MW-1	(c. 1993*)	--	--	--	5
MW-2	(c. 1993*)	--	--	--	110
MW-3	(c. 1993*)	--	--	--	0.6
MW-4	(c. 1993*)	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
MW-5	(c. 1993*)	--	--	--	ND
	4-Nov-94	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
MW-6	(c. 1993*)	--	--	--	ND
	4-Nov-94	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
MW-7	(c. 1993*)	--	--	--	ND
	4-Nov-94	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
MW-8	28-Jul-93	--	--	--	<0.5
	4-Nov-94	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
MW-9	27-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
	14-Feb-96	--	--	--	0.5
	8-May-96	--	--	--	ND
28-Aug-96	--	--	--	ND	

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

**Table 5 - Groundwater Chemical Analyses Results: TPH
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Total Petroleum Hydrocarbons			
		Gasoline	Diesel	Oil	418.1
Monitoring Wells Continued		Concentrations in milligrams per Liter (mg/L)			
MW-10	28-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
	14-Feb-96	--	--	--	1.0
	8-May-96	--	--	--	0.80
28-Aug-96	--	--	--	0.72	
MW-11	26-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
MW-12	26-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	0.7
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
	14-Feb-96	--	--	--	ND
	8-May-96	--	--	--	ND
28-Aug-96	--	--	--	ND	
MW-13	27-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
	14-Feb-96	--	--	--	0.7
	8-May-96	--	--	--	ND
28-Aug-96	--	--	--	ND	
MW-14	28-Jul-93	--	--	--	2
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
MW-15A	28-Jul-93	--	--	--	3
MW-15B	28-Jul-93	--	--	--	0.6
MW-15 Free Prod	28-Jul-93	--	Detected ^a	--	--

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

**Table 5 - Groundwater Chemical Analyses Results: TPH
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Total Petroleum Hydrocarbons			
		Gasoline	Diesel	Oil	418.1
Monitoring Wells Continued		Concentrations in milligrams per Liter (mg/L)			
MW-16	27-Jul-93	--	--	--	<0.5
MW-17	27-Jul-93	--	--	--	0.6
MW-18	26-Jul-93	--	--	--	<0.5
	4-Nov-95	--	--	--	ND
	2-Feb-95	--	--	--	ND
	2-May-95	--	--	--	ND
	4-Aug-95	--	--	--	ND
	24-Oct-95	--	--	--	ND
	14-Feb-96	--	--	--	ND
	8-May-96	--	--	--	ND
	28-Aug-96	--	--	--	ND
	MW-19	27-Jul-93	--	--	--
MW-20	28-Jul-93	--	--	--	<0.5
Geoprobes					
GP-3	12-Mar-97	2.32	64.9	--	9.93
GP-8	12-Mar-97	4.54	407	--	2.30
GP-19	25-Jun-98	--	<0.250	<0.500	--
GP-20	25-Jun-98	--	0.995	<0.500	--
GP-21	25-Jun-98	--	<0.250	<0.500	--
GP-22	25-Jun-98	--	8.77	<0.500	--
GP-23	25-Jun-98	--	<0.250	<0.500	--
GP-24	25-Jun-98	--	<0.250	<0.500	--
GP-25	26-Jun-98	--	<0.250	<0.500	--
GP-26	26-Jun-98	--	<0.250	<0.500	--
GP-27	26-Jun-98	--	<0.250	<0.500	--
GP-28	26-Jun-98	--	<0.250	<0.500	--
GP-30	26-Jun-98	--	<0.250	<0.500	--
GP-31	26-Jun-98	--	<0.250	<0.500	--
GP-32	30-Sep-98	--	<0.250	<0.500	--
GP-33	30-Sep-98	--	1.31	<0.500	--
GP-34	30-Sep-98	--	<0.250	<0.500	--
GP-35	30-Sep-98	--	5.80	<0.500	--
GP-36	1-Oct-98	--	0.342	<0.500	--
GP-37	1-Oct-98	--	1.43	<0.500	--
GP-38	1-Oct-98	--	7.12	<0.500	--
GP-39	1-Oct-98	--	3.33	<0.500	--
GP-40	2-Oct-98	--	<0.250	<0.500	--
GP-41	2-Oct-98	--	0.535	<0.500	--
GP-42	2-Oct-98	--	<0.250	<0.500	--

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

**Table 5 - Groundwater Chemical Analyses Results: TPH
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Total Petroleum Hydrocarbons			
		Gasoline	Diesel	Oil	418.1
Geoprobables Continued		Concentrations in milligrams per Liter (mg/L)			
GP-43	2-Oct-98	--	0.419	<0.500	--
GP-44	2-Oct-98	--	1.20	0.547	--
GP-45	2-Oct-98	--	1.22	0.613	--
GP-46	5-Oct-98	--	6.67	1.36	--
GP-47	5-Oct-98	--	0.822	<0.500	--
GP-48	5-Oct-98	--	20.1	<0.500	--
GP-49	6-Oct-98	--	27.4	5.66	--
GP-50	5-Oct-98	--	9.56	1.83	--
GP-51	6-Oct-98	--	0.588	<0.500	--
GP-52	6-Oct-98	--	2.98	<0.500	--

Notes:

1. Gasoline = Total petroleum hydrocarbons (TPH) as gasoline by DEQ Method TPH-G.
2. Diesel = TPH as diesel by DEQ Method TPH-D (1993 through 1997). 1998 analysis by Northwest Method NWTPH-Dx.
3. Oil = TPH as oil by Northwest Method NWTPH-Dx.
4. 418.1 = TPH as diesel and oil by EPA Method 418.1.
5. -- = Not analyzed.
6. * Actual 1993 sampling dates not available (Wells MW-1 through MW-7).
7. < = Not detected at or above the indicated laboratory method reporting limit (MRL).
8. ND = Not detected by HCID (MRL not provided).
9. ^a Hydrocarbon identification (HCID) by GC/FID indicated diesel #2. Additional analysis by ASTM D1298 indicated an API gravity of 28.2 and a specific gravity of 0.8860.
10. Sources: 1993 through 1996 data from Century West (1994, 1996), 1997 data from PEG (1997a), and 1998 data from Hart Crowser investigations. 1993 data has not been subjected to quality assurance review and was used for qualitative purposes only.

Table 6 - Groundwater Chemical Analysis Results: PAHs in Geoprobe Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs						
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene
Geoprobe Explorations		Concentrations in Micrograms per Liter (µg/L)															
GP-3	12-Mar-97	<4.55	<4.55	7.81	18.1	30.1	<4.55	<4.55	1.85	0.950	0.967	1.22	0.678	0.712	0.850	0.851	<4.55
GP-8	12-Mar-97	<17.4	<17.4	56.8	79.7	129	36.6	240	277	213	200	233	185	167	209	198	83.8
GP-19	25-Jun-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100
GP-20	25-Jun-98	0.129	<0.100	<0.500	<0.500	1.60	0.439	3.34	3.54	1.41	3.09	3.05	2.49	1.23	2.51	0.574	2.09
GP-21	25-Jun-98	<0.100	<0.100	<0.100	<0.100	0.137	<0.100	0.187	0.230	<0.100	0.143	0.136	<0.100	<0.100	<0.100	<0.200	<0.100
GP-22	25-Jun-98	<12.5	<1.00	16.1	37.7	32.6	4.12	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00
GP-23	25-Jun-98	0.113	<0.100	<0.100	<0.100	0.327	<0.100	0.705	0.683	0.192	0.365	0.416	0.217	0.164	0.268	<0.200	0.226
GP-24	25-Jun-98	0.140	<0.100	<0.100	0.198	0.549	0.134	1.02	1.02	0.249	0.580	0.629	0.568	<0.100	0.470	<0.200	0.335
GP-25	26-Jun-98	<0.100	<0.100	<0.100	<0.100	0.280	<0.100	0.650	0.670	0.250	0.483	0.523	0.583	<0.100	0.409	<0.200	0.361
GP-26	26-Jun-98	<0.100	<0.100	<0.100	<0.100	0.111	<0.100	0.210	0.217	<0.100	0.122	0.152	0.140	<0.100	<0.100	<0.200	<0.100
GP-27	26-Jun-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100
GP-28	26-Jun-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.161	0.193	<0.100	<0.100	0.140	<0.100	<0.100	<0.100	<0.200	<0.100
GP-30	26-Jun-98	<0.100	<0.100	<0.100	<0.100	0.147	<0.100	0.235	0.218	<0.100	0.108	0.116	<0.100	<0.100	<0.100	<0.200	<0.100
GP-31	26-Jun-98	<0.100	<0.100	<0.100	<0.100	0.104	<0.100	0.136	0.152	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100

Notes:

1. Polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270-SIM.
2. < = Not detected at or above the laboratory method reporting limit (MRL).
3. Sources: 1997 data from PEG (1997a); and 1998 data from Hart Crowser.

Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Location	Sampling Date	Non-Carcinogenic PAHs								Carcinogenic PAHs								
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
MW-1	4-Nov-95	0.4	0.1	1.0	2.4	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	2-Feb-95	6.4	4.0	24	49	92	3.7	4.8	5.1	0.2	0.7	1.2	0.3	0.2	0.3	0.1	ND	
	2-May-95	ND	ND	31	95	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	4-Aug-95	0.6	0.4	2.4	5.4	5	0.1	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	
	24-Oct-95	0.5	0.3	2.0	5.5	4.8	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	14-Feb-96	0.2	ND	1.0	1.9	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	8-May-96	ND	ND	ND	5.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	13-Nov-98	No Sample Collected for Analysis: 0.16 Feet of Free Product in Well																
	18-Feb-99	No Sample Collected for Analysis: 5.54 Feet of Free Product in Well																
	17-May-99	No Sample Collected for Analysis: Well Converted to Interim Action System Extraction Well																
	MW-2	4-Nov-95	0.9	0.5	1.1	0.9	ND	ND	0.9	4.2	0.3	0.8	1.4	0.3	--	0.5		
		2-Feb-95	38	68	280	530	430	56	27	120	ND	23	61	ND	--	ND	ND	ND
2-May-95		32	25	130	290	160	15	22	75	ND	17	23	ND	--	ND	ND	ND	
4-Aug-95		3.9	0.5	0.6	1.3	0.2	2.1	2.5	8.8	0.6	1.8	3.2	0.5	--	1.0	0.2	0.1	
24-Oct-95		8.0	2.0	13	5.0	ND	2.0	12	24	2.0	7.0	13	2.0	--	3.0	ND	ND	
14-Feb-96		0.7	0.4	3.1	5.9	1.1	0.4	ND	0.4	ND	0.1	0.2	ND	--	ND	ND	ND	
8-May-96		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	
28-Aug-96		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	
13-Nov-98		No Sample Collected for Analysis: 0.62 Feet of Free Product in Well																
19-Feb-99		< 2.00	< 2.00	< 5.00	< 5.00	< 2.00	< 2.00	< 2.00	< 5.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 4.00	
17-May-99		No Sample Collected for Analysis: Well Converted to Interim Action System Extraction Well																
MW-3		4-Nov-95	3.1	1.6	9.3	17.0	17.0	2.6	1.3	3.0	0.2	0.5	0.8	0.2	ND	0.3	ND	ND
		2-Feb-95	ND	ND	31	55	49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2-May-95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	4-Aug-95	0.7	0.9	4.8	9.0	3.5	0.5	0.3	0.9	ND	0.1	0.2	ND	ND	ND	ND	ND	
	24-Oct-95	0.4	0.3	2.0	4.8	0.5	0.2	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	
	14-Feb-96	ND	ND	0.3	0.4	0.3	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	
	8-May-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	13-Nov-98	No Sample Collected for Analysis: 0.12 Feet of Free Product in Well																
	19-Feb-99	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	
	17-May-99	No Sample Collected for Analysis: Well Converted to Interim Action System Extraction Well																

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

**Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
		Concentrations in micrograms per Liter (µg/L)																
MW-4	9-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-5	9-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	
MW-6	6-Nov-98	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<1.00	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	
MW-7	6-Nov-98	<0.200	<0.100	0.148	0.132	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-8	14-Feb-96	ND	ND	0.3	0.5	0.5	--	--	--	--	--	--	--	--	--	--	--	
	8-May-96	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	
	28-Aug-96	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	
	13-Nov-98	<1.00	<5.00	<5.00	<5.00	<1.00	<1.00	<1.00	1.46	<1.00	<1.00	1.02	<1.00	<1.00	<1.00	<1.00	<2.00	
	17-Feb-99	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	21-May-99	No Sample Collected for Analysis: 0.36 Feet of Free Product in Well																
	26-Aug-99	No Sample Collected for Analysis: 3.60 Feet of Free Product in Well																
MW-9	13-Nov-98	<2.50	<2.50	3.07	5.19	7.45	<2.50	5.07	4.90	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<5.00	
	17-Feb-99	<1.00	<1.00	1.29	2.35	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	21-May-99	<1.00	<0.100	0.295	0.795	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	27-Aug-99	0.6	0.2	1.3	2.8	0.9	0.3	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-10	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	12-Nov-98	<2.50	<2.50	<2.50	7.44	3.84	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	3.20	<2.50	<2.50	<2.50	<5.00	
	18-Feb-99	<5.00	<1.00	1.69	5.30	2.77	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	21-May-99	<2.50	<2.50	5.07	11.9	7.70	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<5.00	
	25-Aug-99	0.5	0.3	1.6	4.4	4.4	0.3	3.1	2.1	2.1	1.8	2.1	3.3	1.0	2.6	1.8	0.5	

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

**Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
		Concentrations in micrograms per Liter (µg/L)																
MW-11	9-Nov-98	<0.100	<0.100	<0.500	<0.100	<0.200	<0.200	<0.100	0.194	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.500	<0.100	<0.500	<0.500	<0.200	<0.100	<0.100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	0.2	<0.1	0.3	<0.1	<0.1	<0.1	0.1	0.2	<0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1	
MW-12	9-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.1	0.2	0.2	0.2	<0.1	0.2	0.1	<0.1	
MW-13	9-Nov-98	<2.50	<2.50	<2.50	<2.50	0.616	<0.500	<0.100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-Feb-99	<1.00	<0.100	1.30	1.57	0.388	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<1.00	<0.200	0.543	0.805	<1.00	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.400	
	25-Aug-99	0.4	<0.1	0.5	0.7	0.2	0.1	0.5	0.4	0.3	0.3	0.4	0.5	0.2	0.4	0.3	<0.1	
MW-14	28-Jul-93	<0.1	<0.1	0.2	0.9	0.6	<0.1	0.1	0.2	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	2-Feb-95	0.2	ND	4.0	0.9	0.3	--	ND	ND	--	ND	ND	--	--	--	--	--	
	2-May-95	ND	ND	ND	ND	ND	--	ND	ND	--	ND	ND	--	--	--	--	--	
	4-Aug-95	0.3	0.2	1.4	2.7	1.2	--	ND	0.1	--	ND	ND	--	--	--	--	--	
	24-Oct-95	0.1	ND	0.5	1.4	0.4	--	ND	ND	--	ND	ND	--	--	--	--	--	
	14-Feb-96	0.2	0.1	1.1	2.2	0.4	--	ND	ND	--	ND	ND	--	--	--	--	--	
	8-May-96	ND	ND	ND	ND	ND	--	ND	ND	--	ND	ND	--	--	--	--	--	
	28-Aug-96	ND	ND	ND	ND	ND	--	ND	ND	--	ND	ND	--	--	--	--	--	
	13-Nov-98	No Sample Collected for Analysis: 4.66 Feet of Free Product in Well																
	18-Feb-99	No Sample Collected for Analysis: 3.03 Feet of Free Product in Well																
	24-May-99	No Sample Collected for Analysis: 1.43 Feet of Free Product in Well																
	25-Aug-99	No Sample Collected for Analysis: 2.85 Feet of Free Product in Well																
MW-15A	28-Jul-93	0.3	<0.1	1.2	5.4	5.1	0.3	<0.1	0.2	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-15B	28-Jul-93	0.3	<0.1	1.2	5.9	5.8	0.2	0.1	0.3	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-15	4-Nov-95	9.1	5.5	25.0	73.0	61.0	2.6	3.4	7.6	ND	1.1	1.4	ND	ND	ND	ND	ND	
	2-Feb-95	3.4	2.8	15	36	64	1.5	1.7	2.9	ND	0.3	0.7	ND	ND	ND	ND	ND	
	2-May-95	12	15	57	180	320	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	
	4-Aug-95	1.9	2.1	9.2	23	32	0.8	0.7	1.6	ND	0.1	0.2	ND	ND	ND	ND	ND	
	24-Oct-95	0.7	0.5	3.0	11.0	8.1	0.2	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	
	14-Feb-96	0.9	0.7	4.1	12	12	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	8-May-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

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

**Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
MW-15 (cont.)	13-Nov-98	Concentrations in micrograms per Liter (µg/L)																
	19-Feb-99	No Sample Collected for Analysis: 2.09 Feet of Free Product in Well																
	21-May-99	<10.0	<10.0	<10.0	<10.0	10	<10.0	<10.0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	31-Aug-99	<100	<20.0	<400	150	301	25.8	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<40.0	
		22.5	20.6	84.9	291.0	536.0	85.6	<10.0	26.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
MW-16	4-Nov-95	2.7	0.4	2.2	1.7	1.6	0.4	ND	0.2	ND	ND	ND	ND	ND	ND	ND	--	
	2-Feb-95	6.4	4.0	24	49	92	3.7	4.8	5.1	0.2	0.7	1.2	0.3	0.2	0.3	0.1	--	
	2-May-95	ND	ND	20	25	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	
	4-Aug-95	1.4	1.4	6.9	7.9	3.6	0.9	0.2	0.4	ND	ND	ND	ND	ND	ND	ND	--	
	24-Oct-95	0.8	0.5	2.6	4.3	2.0	0.6	ND	0.1	ND	ND	ND	ND	ND	ND	ND	--	
	14-Feb-96	0.3	0.2	1.1	1.5	0.8	0.3	ND	0.2	ND	ND	ND	ND	ND	ND	ND	--	
	8-May-96	ND	ND	ND	7.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	
	12-Nov-98	<5.00	<2.50	8.89	16.4	<5.00	<5.00	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<5.00	
	17-Feb-99	<2.50	<1.00	<12.5	6.94	<1.00	<12.5	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	21-May-99	<10.0	<1.00	4.18	6.08	2.99	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	31-Aug-99	1.9	1.8	9.0	18.1	17.7	5.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-17	4-Nov-95	1.0	0.3	2.7	4.5	3.1	0.2	0.2	0.3	ND	ND	ND	ND	--	ND	--	--	
	2-May-95	ND	ND	14	39	68	ND	ND	ND	ND	ND	ND	ND	--	ND	--	--	
	4-Aug-95	7.3	4.7	28	47	120	2.7	7.2	5.6	0.1	0.5	0.6	0.2	--	0.2	--	--	
	24-Oct-95	0.6	0.2	2.1	3.5	3.1	0.1	0.2	0.2	ND	ND	ND	ND	--	ND	--	--	
	14-Feb-96	14	8.3	36	110	190	4.5	2.9	2.8	ND	ND	1.0	ND	--	ND	--	--	
	8-May-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	--	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	--	
	13-Nov-98	No Sample Collected for Analysis: 0.25 Feet of Free Product in Well																
	19-Feb-99	<200	<100	<500	708	1,530	<200	<100	<100	<12.5	<12.5	12.5	<12.5	<12.5	<12.5	<12.5	<25.0	
	21-May-99	<200	<20.0	<400	207	441	49.4	<200	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<40.0	
	31-Aug-99	0.6	0.3	1.9	5.3	4.9	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
MW-18	9-Nov-98	<0.100	<0.100	<0.100	<0.100	0.121	<0.100	0.262	0.257	0.179	0.168	0.194	0.263	0.163	0.245	0.145	<0.200	
	17-Feb-99	<0.200	<0.200	<0.200	<0.200	0.353	<0.200	0.677	0.67	0.46	0.364	0.496	0.566	0.668	0.664	0.357	<0.400	
	19-May-99	<0.100	<0.100	<0.100	<0.100	0.152	<0.100	0.297	0.310	0.352	0.225	0.262	0.493	0.342	0.446	0.308	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	1.0	0.8	0.7	0.6	0.7	1.1	0.4	0.9	0.6	0.2	

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

Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
		Concentrations in micrograms per Liter (µg/L)																
MW-19	4-Nov-95	2.1	1.1	6.5	17.0	20.0	0.4	0.4	0.7	--	0.1	0.2	--	--	--	--	--	
	2-Feb-95	3.4	2.8	15	36	64	1.5	1.7	2.9	--	0.3	0.7	--	--	--	--	--	
	2-May-95	11	13	56	160	260	ND	ND	13	--	ND	ND	--	--	--	--	--	
	4-Aug-95	13	11	45	130	240	3.0	5.5	12	--	1.4	1.6	--	--	--	--	--	
	24-Oct-95	0.8	0.6	3.5	11	9.8	0.4	0.2	0.1	--	ND	ND	--	--	--	--	--	
	14-Feb-96	4.9	4.1	20	59	100	1.4	ND	2.7	--	ND	ND	--	--	--	--	--	
	8-May-96	ND	ND	ND	17	29	ND	ND	ND	--	ND	ND	--	--	--	--	--	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	--	
	12-Nov-98	No Sample Collected for Analysis: 1.44 Feet of Free Product in Well																
	18-Feb-99	No Sample Collected for Analysis: 7.00 Feet of Free Product in Well																
	24-May-99	No Sample Collected for Analysis: 3.86 Feet of Free Product in Well																
	25-Aug-99	No Sample Collected for Analysis: 11.20 Feet of Free Product in Well																
MW-20	4-Nov-95	20.0	15.0	69.0	190.0	350.0	8.0	8.9	15.0	--	1.1	1.7	ND	--	--	--	--	
	2-Feb-95	3.5	3.1	19	37	72	3.3	1.9	3.2	--	0.3	0.6	0.1	--	--	--	--	
	2-May-95	ND	ND	24	65	110	ND	ND	ND	--	ND	ND	ND	--	--	--	--	
	4-Aug-95	0.8	0.9	4.9	12	11	0.3	0.2	0.4	--	ND	ND	ND	--	--	--	--	
	24-Oct-95	4.0	4.0	17	57	88	ND	2.0	2.0	--	ND	ND	ND	--	--	--	--	
	14-Feb-96	1.1	0.8	4.6	14	16	0.3	ND	ND	--	ND	ND	ND	--	--	--	--	
	8-May-96	ND	ND	ND	ND	38	ND	ND	ND	--	ND	ND	ND	--	--	--	--	
	28-Aug-96	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	
	12-Nov-98	No Sample Collected for Analysis: 0.37 Feet of Free Product in Well																
	18-Feb-99	No Sample Collected for Analysis: 5.77 Feet of Free Product in Well																
	24-May-99	No Sample Collected for Analysis: 4.17 Feet of Free Product in Well																
	31-Aug-99	31.5	26.5	107.0	358.0	689.0	107.0	<10.0	26.7	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
HC-1	5-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-May-99	<0.100	<0.100	<0.100	<1.00	0.530	0.104	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	26-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-2	5-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	26-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-3	5-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	

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

Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
		Concentrations in micrograms per Liter (µg/L)																
HC-3 (cont.)	17-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	26-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-4S	5-Nov-98	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
	15-Feb-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
	17-May-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
	26-Aug-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
HC-4D	5-Nov-98	0.147	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-May-99	<0.100	<0.100	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	26-Aug-99	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-5	12-Nov-98	<0.100	<2.50	<2.50	<2.50	<0.500	<0.500	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<1.00	<1.00	1.21	5.17	<1.00	<1.00	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.400	
	17-May-99	<1.00	<1.00	1.47	5.76	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	26-Aug-99	1.5	0.5	2.6	5.7	0.3	0.4	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-6S	5-Nov-98	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
	15-Feb-99	0.274	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.400	
	17-May-99	0.132	<0.100	<0.100	<0.100	0.110	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	
HC-6D	5-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-7	6-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-8	13-Nov-98	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling																
	16-Feb-99	0.148	<0.100	<0.100	<0.100	0.119	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-9	6-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	

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

**Table 7 - Groundwater Chemical Analyses Results: PAHs in Monitoring Well Samples
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Non-Carcinogenic PAHs									Carcinogenic PAHs							
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	
Concentrations in micrograms per Liter (µg/L)																		
HC-9 (cont.)	18-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	
HC-10	10-Nov-98	<5.00	<5.00	<5.00	10.1	7.22	<2.50	<2.50	<2.50	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<2.50	<2.50	4.86	14.2	17.5	<5.00	<2.50	<2.50	<0.100	<0.100	<0.200	<0.100	<0.100	<0.100	<0.100	<0.200	
	21-May-99	<200	<20.0	<400	155	213	24.7	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<40.0	
	31-Aug-99	3.8	2.5	16.6	41.4	65.2	12.2	1.1	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
HC-11	5-Nov-98	<2.50	<2.50	<2.50	4.46	5.08	<2.50	<2.50	<0.200	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-Feb-99	<2.00	<2.00	<10.0	5.00	7.87	<2.00	<2.00	<2.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	19-May-99	<25.0	<2.50	<50.0	13.6	30.9	3.940	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	<5.00	
	25-Aug-99	1.3	1.1	8.6	9.8	20.3	4.2	0.9	0.9	0.3	0.3	0.3	0.4	0.1	0.3	0.2	<0.1	
HC-12S	5-Nov-98	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						
	16-Feb-99	<1.00	<1.00	1.00	3.10	2.15	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-May-99	<1.00	<1.00	1.48	5.03	1.01	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	
	25-Aug-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						
HC-12D	5-Nov-98	<1.00	<1.00	<1.00	<1.00	<0.500	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	16-Feb-99	<1.00	<1.00	<5.00	5.21	8.19	<2.00	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	18-May-99	<1.00	<0.100	0.310	<10.0	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	25-Aug-99	0.2	<0.1	0.4	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-13	5-Nov-98	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	15-Feb-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	17-May-99	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	
	26-Aug-99	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HC-14	13-Nov-98	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						
	16-Feb-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						
	18-May-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						
	25-Aug-99	No Sample Collected for Analysis: Monitoring Well Dry at Time of Sampling										Dry at Time of Sampling						

Notes:

1. Polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270 (1993 data), EPA Method 8310 (1994 through 1996 data), and EPA Method 8270-SIM (1997 through 1999 data).
2. -- = Not analyzed for compound.
3. < = Not detected at or above the laboratory method reporting limit (MRL).
4. ND = Not detected (MRL not provided).
5. Sources: 1993 through 1996 data from Century West (1994, 1996); 1997 data from PEG (1997a); and 1998 data from Hart Crowser investigations. 1993 data has not been subjected to quality assurance review and was used for qualitative purposes only.

**Table 8 - Groundwater Chemical Analysis Results: VOCs
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location Sampling Date	MW-13 9-Nov-98	MW-18 9-Nov-98
Analyte	Concentrations in micrograms per Liter (µg/L)	
Acetone	<25.0	<25.0
Benzene	<1.00	<1.00
Bromobenzene	<1.00	<1.00
Bromochloromethane	<1.00	<1.00
Bromodichloromethane	<1.00	<1.00
Bromoform	<1.00	<1.00
Bromomethane	<10.0	<10.0
2-Butanone	<25.0	<25.0
n-Butylbenzene	<1.00	<1.00
sec-Butylbenzene	1.16	<1.00
tert-Butylbenzene	<1.00	<1.00
Carbon tetrachloride	<2.00	<2.00
Chlorobenzene	<1.00	<1.00
Chloroethane	<5.00	<5.00
Chloroform	<1.00	<1.00
Chloromethane	<5.00	<5.00
2-Chlorotoluene	<1.00	<1.00
4-Chlorotoluene	<1.00	<1.00
Dibromochloromethane	<1.00	<1.00
1,2-Dibromo-3-chloropropane	<2.00	<2.00
1,2-Dibromoethane	<1.00	<1.00
Dibromomethane	<1.00	<1.00
1,2-Dichlorobenzene	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<1.00
Dichlorodifluoromethane	<5.00	<5.00
1,1-Dichloroethane	<1.00	<1.00
1,2-Dichloroethane	<1.00	<1.00
1,1-Dichloroethene	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<1.00
1,2-Dichloropropane	<1.00	<1.00
1,3-Dichloropropane	<1.00	<1.00
2,2-Dichloropropane	<1.00	<1.00
1,1-Dichloropropene	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<1.00
Ethylbenzene	<1.00	<1.00
Hexachlorobutadiene	<2.00	<2.00
2-Hexanone	<10.0	<10.0
Isopropylbenzene	1.64	<1.00

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

**Table 8 - Groundwater Chemical Analysis Results: VOCs
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location Sampling Date	MW-13 9-Nov-98	MW-18 9-Nov-98
Analyte	Concentrations in micrograms per Liter (µg/L)	
p-Isopropyltoluene	<1.00	<1.00
Methylene chloride	<5.00	<5.00
4-Methyl-2-pentanone	<5.00	<5.00
Naphthalene	<1.00	<1.00
n-Propylbenzene	<1.00	<1.00
Styrene	<1.00	<1.00
1,1,1,2-Tetrachloroethane	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.00	<1.00
Tetrachloroethene	<1.00	<1.00
Toluene	<1.00	<1.00
1,2,3-Trichlorobenzene	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.00
Trichloroethene	<1.00	<1.00
Trichlorofluoromethane	<5.00	<5.00
1,2,3-Trichloropropane	<1.00	<1.00
1,2,4-Trimethylbenzene	<1.00	<1.00
1,3,5-Trimethylbenzene	<1.00	<1.00
Vinyl chloride	<2.00	<2.00
m,p-Xylene	<2.00	<2.00
o-Xylene	<1.00	<1.00

Notes:

1. Volatile organic compound (VOC) analysis by EPA Method 8260.
2. < = Not detected at or above the method reporting limit (MRL).
3. Data from 1998 Hart Crowser investigation.

**Table 9 - Groundwater Chemical Analyses Results: BTEX
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location	Sampling Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes
Monitoring Wells		Concentrations in Micrograms per Liter (µg/L)			
MW-1	Feb-93*	ND	ND	ND	ND
MW-2	Feb-93*	ND	ND	ND	ND
MW-3	Feb-93*	ND	ND	ND	ND
MW-4	Jun-Jul-93*	ND	ND	ND	ND
MW-5	Jun-Jul-93*	ND	ND	ND	ND
MW-6	Jun-Jul-93*	ND	ND	ND	ND
MW-7	Jun-Jul-93*	ND	ND	ND	3.0
MW-8	28-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-9	27-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-10	28-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-11	26-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-12	27-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-13	26-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-14	28-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-15A	28-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-15B	28-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-16	27-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-17	27-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-18	26-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-19	27-Jul-93	<2.0	<2.0	<2.0	<2.0
MW-20	28-Jul-93	<2.0	<2.0	<2.0	<2.0
Geoprobe Explorations					
GP-3	12-Mar-97	<0.500	<0.500	<0.500	<0.500
GP-8	12-Mar-97	<1.00	<1.00	<1.00	<1.00

Notes:

1. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020, 8021, or 8240.
2. * Actual sampling dates not available.
3. < = Not detected at or above the indicated laboratory method reporting limit (MRL).
4. ND = Not detected (MRL not provided).
5. Sources: 1993 data from Century West (1994) and 1997 data from PEG (1997a).
1993 data has not been subjected to quality assurance review and was used for qualitative purposes only.

**Table 10 - Groundwater Chemical Analysis Results: Total and Dissolved Metals
Port of Portland, Terminal 4 - Slip 3 Upland
Portland, Oregon**

Sample Location Sampling Date	HC-1 12-Nov-98	HC-5 12-Nov-98	HC-7 12-Nov-98	HC-9 12-Nov-98	MW-10 12-Nov-98	MW-16 12-Nov-98
	Concentrations in milligrams per Liter (mg/L)					
TSS	3,540	894	675	1,790	162	1,590
Total Metals						
Antimony	<0.00500	<0.00500	<0.00500	<0.00500	<0.00100	0.00650
Arsenic	0.0525	<0.00500	0.0215	0.00700	0.00300	<0.00500
Beryllium	<0.00500	<0.00500	<0.00500	<0.00500	<0.00100	<0.00500
Cadmium	<0.00500	<0.00500	<0.00500	<0.00500	0.0130	<0.00500
Chromium	0.0710	0.0190	0.0465	0.0430	0.00370	0.00500
Copper	0.111	0.0220	0.0585	0.0665	0.00910	<0.0100
Lead	0.0300	0.0110	0.0140	0.0305	0.0474	<0.00500
Nickel	0.0665	0.0290	0.0615	0.0930	0.0120	0.0175
Selenium	<0.00500	<0.00500	<0.00500	<0.00500	<0.00100	<0.00500
Silver	<0.00500	<0.00500	<0.00500	<0.00500	<0.00100	<0.00500
Thallium	0.0115	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Zinc	0.229	0.0960	0.151	0.183	0.0937	0.216
Mercury	0.00220	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Dissolved Metals						
Antimony	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Arsenic	0.00270	0.00100	0.00820	<0.00100	0.00180	<0.00100
Beryllium	0.0507	<0.00100	<0.00100	<0.00100	0.0485	<0.00100
Cadmium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Chromium	<0.00100	0.00120	<0.00100	<0.00100	0.00110	<0.00100
Copper	0.00230	<0.00200	0.00310	<0.00200	<0.00200	<0.00200
Lead	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Nickel	0.00550	0.00970	0.00770	0.00450	0.0102	0.00820
Selenium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Silver	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Zinc	0.0117	0.00570	0.00570	<0.00500	<0.00500	0.0152
Mercury	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200

Notes:

1. TSS = Total suspended solids analysis by EPA Method 160.2.
2. Total and dissolved metals analyses by EPA 6000/7000 Series methods.
3. < = Not detected at or above the method reporting limit (MRL).
4. Data from 1998 Hart Crowser investigation.