URS

REMEDIAL INVESTIGATION
FEASIBILITY STUDY
EVERETT SHIPYARD
1016 14th STREET
EVERETT, WASHINGTON

For

Everett Shipyard, Inc.
URS JOB NO.: 33761354

May 9, 2011

State of Washington
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List of Acronyms

ARAR	Applicable Relevant and Appropriate Requirements
AO	Agreed Order
BA	Biological Assessment
BEHP	Bis-2ethylehxyl phthalate
bgs	below ground surface
BMP	Best management Practice
BO	Biological Opinion
CAO	Cleanup Action Objective
CAP	Cleanup Action Plan
CD	Consent Decree
CF	Conversion Factor
CFR	Code of Federal Regulations
CLs	Cleanup Levels
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
CSL	Cleanup Screening Level
CSM	Conceptual site model
CZMA	Coastal Zone Management Act
CWA	Clean Water Act
CY	Cubic Yards
DCA	Disproportionate Cost Analysis
Ecology	Washington Department of Ecology
EDC	1,2-Dichloroethane
ESA	Environmental Site Assessment
ESRD	Everett Ship Repair & Drydock, Inc.
ESY	ESY, Inc.
HDPE	High-Density Polyethylene
Landau	Landau Associates
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
MLLW	Mean Lower Low Water
MNR	Monitored Natural Recovery
MTCA	Model Toxics Control Act Cleanup Regulation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRWQC	National Recommended Water Quality Criteria
NTR	National Toxics Rule
NWP	Nationwide Permit
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated Biphenyls
PCE	Tetrachoroethene
PCLs	Preliminary Cleanup Levels
PCP	Pentachlorophenol
PID	Photo-ionization Detector

PLP	Potentially Liable Person
POC	Point of compliance
Port	Port of Everett
PQL	Practical quantification limit
PSLs	Preliminary Screening Levels
PVC	Polyvinyl chloride
PSCAA	Puget Sound Clean Air Agency
PSDDA	Puget Sound Dredged Disposal Analysis
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance and Quality Control
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
R^2	Coefficient of Determination
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROW	Right-of-Way
SAP	Sampling and Analysis Plan
SEF	Sediment Evaluation Framework: Refer to http://www.nwp.usace.army.mil/pm/e/rset.asp
SEPA	State Environmental Policy Act
SF	Square Feet
SMP	Shoreline Master Program
SMS	Sediment Management Standards
SQS	Sediment Quality Standards
SVOCs	Semi-Volatile Organic Compounds
SWPPP	Stormwater Pollution Prevention Plan
SWQS	Surface Water Quality Standards
TBT	Tributyltin
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
TTEC	Total Toxic Equivalent Concentration
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
URS	URS Corporation
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	Volatile Organic Compounds
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

The former Everett Shipyard, Inc. facility (the Site) is generally located at 1016 14th Street west of West Marine View Drive, Everett, Washington. This Remedial Investigation/Feasibility Study (RI/FS) report presents the existing data for soil, groundwater and sediment conditions at the Site, establishes preliminary cleanup levels (PCLs) for indicator hazardous substances detected at the Site, evaluates potential cleanup action alternatives, and recommends a preferred cleanup action. This report has been prepared pursuant to an Agreed Order meeting the requirements of the Model Toxics Control Cleanup Act (MTCA) administered by the Washington State Department of Ecology (Ecology) under Chapter 173-340 of the Washington Administrative Code (WAC), and the requirements of the Sediment Management Standards (SMS) administered by Ecology under Chapter 173-204 WAC.

SITE BACKGROUND

The Site is owned by the Port of Everett (Port) and includes approximately five acres of upland, west of West Marine View Drive, and adjacent in-water areas where the Port and ESY, Inc. (ESY) historically performed operations. From 1959 to 2008, ESY leased most of the upland portion of the Site from the Port ("Lease Area") and operated a boat building, maintenance and repair facility. The in-water areas are within the Port's North Marina and include a marine railway. The Port's Travel Lift and Boat Haul-Out facility is located north of the marine railway. In addition, the Port owned and/or operated vessel and marine-related services adjacent to the Lease Area. The Lease Area is not currently occupied by a tenant and most of the unpaved portions of the Lease Area are surrounded by a chain-link fence.

The Port intends to redevelop the Site. Although redevelopment would include covering a large portion of the Site with buildings or pavement, opportunities for green/low impact development will be looked at including the incorporation of additional landscaped areas where possible to help minimize the amount of stormwater runoff that would need to be managed. Current redevelopment plans include an upgrade to the stormwater system to a "State of the Art" filter system. The timing for redevelopment is uncertain. Existing zoning maps identify the zoning of the Site as Waterfront Commercial, a designation that does not fit within MTCA's characteristics of Industrial Land Use. The City of Everett has approved a development plan that states the Site will be used for commercial and public access uses which could include commercial development such as professional office space and retail shopping. However, this does not completely rule out the possibility that the property[1] could be used for residential purposes based on its current zoning.

Several previous environmental studies have been completed at the Site (conducted between the late 1980s to 2007), which identified hazardous substances in soil exceeding PCLs, and sediment concentrations exceeding SMS cleanup levels. To address this contamination, on April 2, 2008, Ecology, ESY and the Port entered into Agreed Order No.: DE 5271 (Agreed Order) to conduct a RI/FS and to develop a draft Cleanup Action Plan (CAP) addressing potential upland and in-water contamination related to releases from the Site.

[1] The Site is approximately 410 feet deep from the current shoreline to Marine View Drive.

REMEDIAL INVESTIGATION

The RI in combination with the prior investigations at the Site identified the nature and extent of contamination including indicator hazardous substances (i.e., hazardous substances exceeding PCLs), the sources of hazardous substances, and the receptors. The findings for the RI including sources of hazardous substances, the extent of impacts, transport mechanisms, and receptors are described below for the upland and marine portions of the Site.

Upland

Primary upland sources of contamination associated with the Site include abrasive blasting and painting operations from ESY and machining operations from Everett Engineering, a tenant that sub-leased portions of the Site from ESY. The abrasive blasting and painting operations were historically conducted outside buildings primarily within the central and southwestern portions of the Site. Metals and antifouling agents, such as tributyltin (TBT), and other marine paint additives such as polychlorinated bipehnyls (PCBs) could also have been released during the blasting process as coatings were removed from vessels. Other hazardous substances used and stored at the Site included gasoline, heating oil, paints, solvents, cutting oils, glues, hydraulic oil, creosote, rust preventers, and antifreeze.

While mechanical repairs were not routinely performed at the shipyard, private boat owners were historically allowed to perform their own boat maintenance on the Site, and as a result, may have released petroleum products which contained diesel- and oil-range petroleum hydrocarbons and carcinogenic polycylic aromatic hydrocarbons (cPAHs). Other potential sources of petroleum hydrocarbons and/or cPAHs include: machine shop operations; existing and former above ground and underground storage tanks including petroleum hydrocarbons that may have been released from suspected underground storage tanks near the Harbor Marine building; treated wood; application of used oil to suppress dust on unpaved surfaces (as recalled by Everett Shipyard personnel); net-dipping operations; and creosote used to treat wood.

Soil and groundwater in and around areas where these hazardous substances were used and stored were characterized during the RI. The indicator hazardous substances for soil detected during the investigations are: arsenic, lead, antimony, copper, cPAHs, PCBs and petroleum hydrocarbons. The investigation results indicate that the presence of these constituents in soil is laterally extensive, covering most of the Lease Area and some areas off of the Lease Area to the south. Soils impacted by petroleum hydrocarbons were also detected adjacent to a bulkhead southeast of the Port’s Travel Lift. The depth of soil contamination is generally less than 3 feet below ground surface (bgs), except in the vicinity of the bulkhead near the Port’s Travel Lift where petroleum-impacted soil was identified to a depth of about 15 feet bgs. The estimated volume of impacted soil is approximately 19,000 cubic yards (CY). Some of the impacts to soil appear to be from releases outside of the Lease Area, but all of the source(s) have not yet been confirmed.

The primary transport mechanism related to contaminants in soil at the Site is via stormwater runoff. Analysis of accumulated solids in the catch basins connected to outfalls in the adjacent marina, revealed elevated levels of arsenic, copper, lead, mercury, zinc and TBT, indicating that releases from Site sources and/or off-site sources had likely entered one or more of the catch basins and discharged into the adjacent marina. Impacted soil also has the potential to be redistributed within the Site as a result of wind re-suspension as fugitive dust during periods of significant wind velocity and/or operations; however, the soil data collected during the RI indicates that this may not be a significant transport mechanism.

Groundwater is present beneath the Site at depths between 3 and 6 feet bgs. This groundwater is not used for drinking water and groundwater should not be considered potable due to the proximity to marine waters and high level of salinity. Therefore, PCLs were based on protection of marine surface water quality. Indicator hazardous substances in groundwater are limited to selected metals (arsenic, nickel and zinc), one semi-volatile organic compound (bis[2-ethylehxyl]phthalate), and diesel-range petroleum hydrocarbons. In the central eastern portions of the Site, none of these constituents were consistently detected above the PCLs. With the exception of dissolved arsenic in the southwest portion of the Site and petroleum hydrocarbons in the northwest portion of the Site near the Port's Travel Lift, none of the groundwater samples collected along the western side of the Site, nearest the North Marina, exhibit contaminant levels exceeding PCLs. These results indicate that contaminant transport from soil to the underlying groundwater and then to the marina appears to be limited. Groundwater generally flows to the west and has the potential to transport contaminants into the adjacent marina.

Potentially significant current and future exposure pathways include direct contact to soil or shallow groundwater and inhalation of soil contaminants that may have migrated into the air as windblown/fugitive dust.

Marine Sediments

Marine sediments in portions of the North Marina adjacent to the leasehold are believed to have historically been exposed to contaminants from a variety of upland sources and other activities in the marina itself including operations at the Port's former Tidal Grid, located south of the marine railway, and the Port's Travel Lift. Areas around the marina have been historically used for ship maintenance and repair activities by ESY and others, included cleaning, sandblasting and painting of vessel hulls, and miscellaneous machine shop operations. Wastes resulting from these and other industrial and commercial operations in the area had the potential to be transported to the marine environment.

Portions of the Site and other adjacent upland areas have historically been drained by several stormwater systems that discharge into the marina. Any materials that enter these stormwater conveyances, e.g., by being washed into storm drain inlets through vessel cleaning or rain events, have the potential to be released into the marina and potentially contaminate the marina sediments. Direct overland runoff into the marina in areas not protected with curbs or other barriers is another potential means of upland contaminants reaching the marina sediments. One notable example is the sloping paved area where the marine railway comes ashore. Groundwater discharging into the marina also has the potential to transport upland contaminants to the marine environment, although Site groundwater data suggest this is not a major transport mechanism. Wind also has the potential to redistribute upland contaminants, although the prevailing winds would more likely have moved contaminants away from the marina.

Marine sediment sampling during two historical sampling events and three phases of RI sampling has demonstrated that portions of the nearshore sediments in the northeastern portion of the North Marina are contaminated with a variety of chemicals. The most widespread contaminants include organic and inorganic materials, including various semi-volatile organic compounds (SVOCs) including cPAHs, the antifouling metallic compound TBT, other metals, PCBs, and a variety of petroleum-based materials.

Three areas of contaminated nearshore marine sediments have been identified in the North Marina. One comparatively small area of contamination is located at the point where a stormwater outfall designated Outfall C discharges into the marina approximately 90 feet southwest of the southwest corner of the Lease Area. The contamination in this area is limited to several SVOCs. It is estimated that this area of contamination involves approximately 100 CY of sediment.

The most extensive area of contaminated sediment is the nearshore sediments north from the Port of Everett's former Tidal Grid to the Port's Travel Lift and then west to the newer sheetpile bulkhead. This area also includes impacted sediments around ESY's marine railway where the highest concentrations were found. Sediment sampling demonstrated that contamination in these nearshore sediments typically reaches on average about 60 feet out from the bulkhead. The contaminants include SVOCs, TBT, and other metals. It is estimated that this area of contamination involves a total of approximately 3,300 CY of sediment, plus an additional 1,000 CY for the outer portion of marine railway sediments.

A third area of sediment contamination involves the sediment and backfill material between the dual timber bulkheads that run from stormwater Outfall A north to the Travel Lift and then west to the newer sheetpile bulkhead. Outfall A, which collects stormwater from the northwest portion of the Lease Area and the adjacent roadway, discharges into the material between the two bulkheads. In addition, based on observations made during RI sampling, at least five other outfalls discharge into the Travel Lift area and into the material located between the two bulkheads in this area. The areas drained by these five other outfalls have not been identified as being part of the Site. Contaminants found in these sediments and fill materials include SVOCs, TBT, other metals, and PCBs. Petroleum contamination was also observed in a portion of the bulkhead area during bulkhead sediment sampling and subsequently confirmed by laboratory analysis. It is estimated that the volume of contaminated materials in the dual bulkhead area is approximately 400 CY.

Thus the total volume of contaminated sediments at the Site is estimated to be approximately 4,800 CY.

FEASIBILITY STUDY

Based upon the results of the RI, the FS identified four upland cleanup action alternatives and two marine cleanup action alternatives. The FS evaluates the cleanup action alternatives for the Site against the MTCA and Sediment Management Standard requirements, and identifies a preferred cleanup action alternative.

Upland Alternatives

The indicator hazardous substances identified at the Site are not very conducive to treatment. Therefore, the feasibility study focused on alternatives that included excavation with off-site disposal of impacted soil and on-site containment. None of the alternatives would remove all of the impacted soil because that is considered to be impracticable.

The four alternatives are:

- Upland Alternative 1 – Targeted/Limited Excavation of PCB-Impacted Soil and Bulkhead Soils (1,300 CY), Off-site Disposal, Engineered-Cap, and Institutional Controls and Long-Term Monitoring
- Upland Alternative 2 –Excavation of 9,400 CY of Soil and Off-site Disposal, Engineered Cap, and Institutional Controls and Long-Term Monitoring
- Upland Alternative 3 – Building Demolition, Mass Excavation of 18,800 CY of Soil and Off-site Disposal and Institutional Controls and Long-Term Monitoring
- Upland Alternative 4 – Bulk Excavation of 14,800 CY of Soil including All Contaminated Soil near Puget Sound and Soil Containing High Mass of Contamination, Off-site Disposal, Demolition of two buildings (Everett Engineering Buildings 7 and 9), Installation of Engineered Cap, and Institutional Controls and Long-Term Monitoring

It is anticipated that groundwater would achieve compliance with the preliminary groundwater cleanup levels following implementation of the selected upland cleanup action alternatives via natural attenuation. Therefore, treatment of groundwater is not included in any of the cleanup action alternatives.

For the upland portion of the Site, a Disproportionate Cost Analysis (DCA) was performed to evaluate relative costs and benefits of the four upland alternatives to determine which alternative is permanent to the maximum extent practicable. This analysis compares the costs and benefits of alternatives and results in selecting the alternative whose incremental costs are not disproportionate to the incremental benefits. Consistent with MTCA requirements, the overall weighted benefit score and cost of each remedial alternative are compared to those scores for the most permanent alternative, Alternative 3. The DCA, including the estimated cost (present worth) for each alternative, is summarized in the table below.

Alternative	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Probable Cost (Thousands $)	$1,800	$2,700	$5,400	$3,800
Volume of Impacted Soil Excavation (Cubic Yards)	1,300	9,400	18,800	14,800
Indicator Hazardous Substance Mass Removal Rate (% Overall Weighted)	15%	56%	99%	98%
Overall Weighted Benefit Score	2.8	4.7	9.7	8.3
Overall Alternative Benefit Ranking	4 (Least Beneficial)	3	1 (Most Beneficial)	2
Ratio of Cost/Benefit	643	574	557	458
Is the alternative "permanent to maximum extent practicable?"	No	No	No	Yes

The DCA calculated the ratio of the estimated cleanup cost to the overall weighted to assist in evaluating which upland alternative is permanent to the maximum extent practicable. The most cost-effective alternative is the alternative with the lowest calculated cost/benefit ratio. Alternative 4 (the second most permanent alternative) has the lowest cost/benefit ratio of “458.”

As such, Alternative 4 is found to be more cost effective than Alternatives 1 (score of 643), 2 (score of 574), and 3 (score of 557). When compared to Alternative 4, Alternative 3 would cost 42% more ($1.6 million) and would remove about 1 percent more mass of the most toxic constituents at the Site (combined mass of arsenic, lead, cPAHs, petroleum, and PCBs). The incremental cost for Alternative 3 is considered disproportionate to the incremental degree of benefit achieved over that of Alternative 4.

As Alternatives 1, 2, and 4 would leave affected soil in place at the Site, a proper Soil/Groundwater Management Plan is needed to address residual contamination that may be encountered during future site redevelopment. As part of the plan, the potentially liable persons (PLPs) will be responsible for managing all residual contaminated soil or groundwater encountered during any future construction activities. The Soil/Groundwater Management Plan shall address recognition and characterization of potential soil and groundwater contamination, as well as methods for handling and disposal of any contamination that is encountered.

It is anticipated that future contingency capital cleanup costs will be necessary to address contamination (i.e., excavation/removal, off-site disposal, etc.) during future subsurface construction activities at the Site (e.g., future site redevelopment). As such, future contingency costs associated with managing contaminants in soil or groundwater that may be encountered during future site redevelopment (assumed to occur by the year 2020) were estimated. These estimates were developed using unit costs identified in the site-specific cost estimate along with an estimated amount of residual soil volume to be handled during and after site redevelopment. The approximate future contingency capital cleanup costs for Alternatives 1, 2 and 4 are estimated to be $3.3 million, $1.8 million, and $0.76 million (present worth) due to an extensive site redevelopment, respectively.

Marine Alternatives

The sediments in the marina are periodically dredged to maintain proper navigational depths and therefore, there is limited opportunity to manage the sediments in place. The following two alternatives were considered for marine sediments, both of which rely primarily on dredging impacted sediments and off-site disposal.

- Marine Sediment Alternative 1 – Targeted Dredging and Containment which includes dredging of selected areas based on accessibility
- Marine Sediment Alternative 2 - Mass Dredging

Alterative 1 would require long-term monitoring, but Alternative 2 does not require long-term monitoring. Alternative 2 includes removal of all of the impacted sediments and is considered the most permanent alterative for marine sediments.

The estimated total present worth cost for Alternative 1 including targeted dredging, capping and long-term monitoring is approximately $2.0 million. The capital cost (equivalent to present worth for this alternative) for Alternative 2 for mass dredging is $2.0 million.

PREFERRED ALTERNATIVES

Upland Alternative

Alternative 4 is the MTCA preferred remedy based on the DCA and includes: the following components:

- Excavate a total of approximately 14,800 cubic yards of soil including removal of all impacted soil in close proximity of Puget Sound and areas with the highest contaminant concentrations.
- Demolish two buildings (Everett Engineering Buildings 7 and 9) where high levels of PCBs and petroleum impacted soil were found beneath these buildings.
- Dispose of all impacted soil excavated at the Site at permitted disposal facilities.
- Conduct soil confirmation analytical testing of excavation sidewall and bottom samples to confirm that PCLs are achieved for the Site.
- Install engineered cap on remaining soils containing concentrations of hazardous substances above PCLs beneath buildings, pavement, or other structures.
- Clean out stormwater system and modify, as needed, in new paved surfaces.
- Install four new monitoring well and conduct two years of groundwater performance monitoring.
- Implement environmental covenant and five-year periodic reviews by Ecology.

Alternative 4 would permanently remove most of the contaminated soil from the uplands Site and focuses on removing the areas with the highest concentrations of contamination. For the most toxics constituents, estimated contaminant mass reduction at the Site following implementation of Alternative 4 would be as follows:

- approximately 96 % of the arsenic
- approximately 93 % of the lead,
- approximately 99 % of Petroleum Hydrocarbons
- approximately 90 % of the cPAHs, and
- approximately 99 % of the PCBs.

The post-excavation residual upland soil contamination would be predominately located beneath buildings and concrete slabs, where the removal costs would be disproportionately high. The concentration of contaminants remaining beneath these covered areas is relatively low, and the cost to remove this soil would be disproportionately high considering the low contaminant mass. The residual upland soil contamination would be covered by an engineered cap (i.e., improved pavement systems including concrete floors for existing buildings and asphalt paved areas) and would not present an unacceptable risk to human health and the environment. Residual risks from residual upland soil contamination would be appropriately managed through institutional controls, including deed restrictions and a Soil/Groundwater Management Plan which would be implemented during potential future Site redevelopment. It is noted that the entire Site is targeted for redevelopment in the future including demolishment[2] of all of the buildings and the installation of new utilities. As such, as part of the Soil/Groundwater Management Plan, the potentially liable persons (PLPs) will be responsible for managing all residual contaminated soil or groundwater encountered during future construction activities. The Soil/Groundwater Management Plan shall address recognition and characterization of potential soil and groundwater contamination, as well as methods for handling and disposal of any contamination that is encountered.

Marine Alternative

Alternative 2, mass dredging, is the most permanent alternative and was selected as the alternative for the marine portion of the Site. Alternative 2 would remove the entire area where sediment concentrations exceed the SMS cleanup levels and would be the most protective, as it would remove the contaminated sediment, eliminate the chance of ecological or human contact with contaminated sediment and the need for long-term monitoring

[2] The remaining structures at the Site are anticipated to be demolished in 2012 or prior to the beginning of major upland remedial construction per the Port's latest information.

1.0 INTRODUCTION

This report presents the Remedial Investigation and Feasibility Study (RI/FS) for Everett Shipyard, Inc. site (the Site) in Everett, Washington to the Washington State Department of Ecology (Ecology). The report has been prepared in accordance with the requirements outlined in Agreed Order DE 5271 (Agreed Order). The Site is generally located at 1016 14th Street west of West Marine View Drive, Everett, Washington (the northwest ¼ of Section 18, Township 29 North, Range 5 East).

The "Site" is defined in Agreed Order Section IV.A as:

> *The Site (or Facility) is referred to as Everett Shipyard (the Site) and is generally located at 1016 14th Street west of West Marine View Drive, Everett, Washington (the northwest ¼ of Section 18, Township 29 North, Range 5 East). The Site is owned by the Port and includes approximately five acres of upland and adjacent in water areas. Everett Shipyard has a current leasehold on the Site and operates on Parcel Number 29051800208311, identified from the Snohomish County Assessor's Office. The Site is defined by the extent of contamination caused by the release of hazardous substances at the Site and is not limited by property boundaries. The Site includes areas where hazardous substances have been deposited, stored, disposed of, placed, or otherwise come to be located.*

The Site is owned by the Port of Everett (Port) and includes approximately five acres of upland and adjacent in-water areas. ESY, Inc. (ESY), formerly Everett Shipyard, Inc., formerly Fishermen's Boat Shop, Inc., operated a boat building, maintenance and repair facility at 1016 14th Street in Everett, Washington ("Site", see Figure 1-1) from 1959 to 2008. The Port also owned and/or operated vessel and marine-related services on or adjacent to the Site. The upland portion of the Site covers approximately four acres. It is located west of West Marine View Drive and includes a portion of the North Marina, which is located within Port Gardner Bay. A marine railway, formerly operated by ESY, extends into the North Marina from the Site and was used to transport marine vessels onshore.

ESY leased the upland portion of the Site from the Port. On March 31, 2008, ESY sold substantially all of its assets to Everett Ship Repair & Drydock, Inc. (ESRD), a wholly owned subsidiary of Todd Shipyard Corporation. ESRD vacated the Site in fall 2009. Previous investigations conducted on the area leased by ESY and in the adjacent North Marina area, near the marine railway, identified hazardous substances in soil and sediment exceeding potentially applicable cleanup levels (Landau, 2003 and 2004; URS, 2007b).

On April 2, 2008, the Washington Department of Ecology (Ecology), ESY (then Everett Shipyard, Inc.) and the Port entered into Agreed Order No.: DE 5271 to conduct a Remedial Investigation/Feasibility Study (RI/FS) per WAC 173-340-350, and to develop a draft Cleanup Action Plan per WAC 173-340-350 through 173-340-380 addressing both potential upland and in-water (i.e., adjacent marine sediment) contamination related to releases from the Site (Ecology, 2008). Accordingly, this RI/FS report considers the existing Site data, results of additional investigation of soil, groundwater and sediment conditions at the Site, establishes cleanup levels for indicator hazardous substances detected at the Site, evaluates potential cleanup action alternatives, and recommends a preferred cleanup action.

The RI/FS was completed in accordance with the RI/FS Work Plan (URS, 2008), and subsequent work plans (URS, 2009b, 2010a, 2010, b, 2010c, 2010d). This RI/FS Report was prepared to meet the requirements outlined in Exhibit B, Section A.3 of Agreed Order No. DE 5271.

1.1 PURPOSE AND OBJECTIVE

The purpose and objective of this RI/FS is to collect, develop, and evaluate sufficient information regarding the Site to select a preferred cleanup action. The RI includes characterizing the nature and extent of contamination at the Site and developing a conceptual site model that includes identification of sources, transport mechanisms and receptors. The FS identifies applicable relevant and appropriate requirements, including cleanup levels, the media requiring cleanup, and remedial action objectives. The FS then evaluates a range of cleanup action alternatives and identifies the preferred cleanup action alternative. Requirements for the RI/FS are described in WAC 173-340-350. Requirements for selecting a cleanup action and expectations for cleanup action alternatives are described in WAC 173-340-360 through 173-340-370, respectively.

1.2 RI/FS REPORT ORGANIZATION

The remainder of this Section 1.0 presents site background information (see Section 1.3) including results of some of the prior phases of investigation. Future land use is described in Section 1.4. The remainder of this report is organized into the following sections:

- Section 2.0 of this report describes the Site investigations. Media investigated includes soil, groundwater, sediment within catch basins and marine sediment.
- Section 3.0 of this report describes the physical characteristics of the Site including the surface features (e.g., buildings), surface water, soil, groundwater and sediment.
- Section 4.0 of this report describes the nature and extent of the contamination detected during the RI in the soil, groundwater and sediments.
- Section 5.0 of the report describes the conceptual site model including potential source areas, transport mechanisms, exposure pathways and receptors.
- Section 6.0 of the report describes cleanup action objectives, cleanup levels and remediation levels for impacted media.
- Section 7.0 of the report identifies state and federal laws that are applicable to potential cleanup actions at the Site which are commonly known as applicable, relevant, and appropriate requirements (ARARs).
- Section 8.0 describes Model Toxics control Act (MTCA) and Sediment Management Standards (SMS) evaluation criteria.

- Section 9.0 of the report describes the environmental media requiring cleanup and remedial action alternatives for each media.
- Section 10.0 of the report presents an analysis of the cleanup action alternatives identified in Section 9.0.
- Section 11.0 of this report presents the preferred cleanup action.
- Section 12.0 lists the references cited throughout the report.

Supporting documents and data summaries are included as appendixes.

1.3 SITE BACKGROUND AND SETTING

1.3.1 Site Description

The upland portion of the Site is relatively flat and is estimated to be 15 feet (within +/- 2 feet) above Mean Lower Low Water (MLLW) sea level. The in-water portion of the Site includes the intertidal (areas exposed to air at low tide) and sub-tidal (areas always covered by water) parts of the Site associated with adjacent marine waters, generally located on the western portion of the Site. It also includes an area near the marine railway and several current and historical outfalls that discharge surface water from the upland portion of the Site and surrounding areas into the North Marina.

Areas to the north and south of the Site are currently, or have been historically, used for industrial or commercial purposes. The surrounding area is used primarily for marine-based businesses, but also includes restaurants and other retail businesses. Some areas on and adjacent to the Site are used by business employees and customers, but are also accessible to the general public along various roads and right-of-ways that surround the Site. Some docks within the North Marina are also accessible to the public. Areas to the north and adjacent to the south of the Site are currently undergoing redevelopment and many buildings have been demolished within the past few years. No residential areas are currently situated on or adjacent to the Site. Single family residences are located on the top of the bluff east of West Marine View Drive (Figure 1-2).

The paragraph below discusses the historical ESY "Lease Area" and is not to be confused with the definition of "Site". The term Lease Area defines the area of Port property designated for use by Everett Shipyard under a formal lease agreement. The Site is not defined by property boundaries or lease areas, but by areas where hazardous substances have been deposited, stored, disposed of, placed, or otherwise come to be located (see prior definition in Section 1.0).

ESY leased approximately 5 acres in the North Marina Area ("Lease Area") from the Port (Figure 1-2). The Lease Area is not currently occupied by a tenant and most of the unpaved portions of the Lease Area are surrounded by a chain-link fence. The Lease Area is generally bounded to the east by West Marine View Drive, to the north by 14th Street, to the west by Montague Street, and to the south by a paved area and the former Net Shed building. The North Marina and Port Gardner Bay are located approximately 80 feet west of the Lease Area boundary. The Site is developed with a number of buildings, which are summarized in Table 1-1. According to Everett Shipyard personnel, the following modifications to the Lease Area boundary have occurred since Everett Shipyard purchased the business in 1959:

- The southern portion of the western boundary was moved approximately 20 feet to the east at the request of the Port to provide parking spaces for vehicles in this area.
- The Lease Area boundary was modified when the adjacent fish processing/cold storage building was constructed in the late 1970s, and the former Port of Everett road encircling the Lease Area was blocked by the cold storage building and therefore the use of the road was discontinued.
- In the 1990s, the City of Everett widened West Marine View Drive and constructed a sidewalk. The Lease Area boundary was moved approximately 10 feet to the west.
- The City of Everett recently widened the western right-of-way along West Marine View Drive to accommodate a new 17-foot wide concrete sidewalk. The sidewalk and adjacent roadway overlap approximately 15 to 20 feet of the former Lease Area along the eastern boundary. URS understands that in 2009 the Port transferred ownership of the property beneath the sidewalk to the Washington State Department of Transportation (WSDOT).

The surrounding area consists of commercial and industrial development. The mouth of the Snohomish River is approximately 1 1/4 miles north of the Site (Figure 1-1).

1.3.2 Site History

The history of the Site development and operations was prepared by reviewing historical records, including Sanborn Fire Insurance maps (1902, 1914, 1950, 1957 and 1968), aerial photographs (1947, 1965, 1969, 1974, 1978, 1984, 1991 and 1995) and topographic maps (1897, 1944, 1953, 1968, and 1973) which are included in Appendix B of the Final RI/FS Work Plan (URS, 2008), and interviews with Everett Shipyard personnel. Figure 1-2 shows the current structures on the Site. Table 1-1 lists the current and historic structures and Site operations and provides a general description of the activities completed at each building and area, including chemical use, storage and disposal practices. The Site development and operational history are described below.

Site Development

The Site appears to have been part of Port Gardner Bay in the earliest topographic maps dated 1897 and 1944 and Sanborn Fire Insurance Maps dated 1902 and 1914. By 1947, the upland portion of the Site had been filled and the bulkhead to the west appears to have been constructed. The limited nature of the vegetation on the Site in 1947 suggests recent completion of filling behind the bulkhead.

Building descriptions presented below are based in part on the details provided on the Sanborn Fire Insurance Maps. A joiner shop and fabrication bay building (Fishermen's Boat Shop) were present at the western portion of the present day weld and wood shops. Boat skids were located between the joiner shop and the bulkhead and were used to side-track boats that were hauled out of the water. The boat skid area appears to have been used to haul boats out of the water and transport them to the joiner shop. Two ancillary buildings (referred to on Sanborn Maps as paint shop and re-saw buildings) were located near the current weld shop (fabrication bay) and wood shop buildings. A machine shop was located near the northeast corner of the Site in the 1950 Sanborn Fire Insurance Map. The 1957 Sanborn Fire Insurance Map shows a marine railway extending west from the joiner shop to the bulkhead, in the approximate location of the current marine railway. A boat transfer railway is located south of the joiner shop (current wood shop) and was used to move boats along the uplands. By the late 1960s, development of the property included additional skids on the northeast portion of the property, and the presence of small-scale boat storage and fish processing operations (Figure 1-2). The construction of the eastern portion of the Everett Engineering machine shop building also appears to have been completed by the late 1960s.

In the 1970s, development included construction of the east end of the weld shop (fabrication bay), and a boat shed north of the northeast portion of the present day weld shop (fabrication bay). The 1980s included development of the two additional Everett Engineering buildings (Buildings 7 and 9). The fish processing building located within the Lease Area (Figure 1-2) and depicted on the 1968 Sanborn Map, was no longer apparent in the 1984 aerial photograph. The skids on the northeast portion of the property were no longer apparent by 1991.

The North Marina adjacent to the shipyard has been operated as a marina since at least 1959. Prior to this time, at least one shingle mill operated adjacent to the marina. Periodic maintenance dredging was required to maintain navigable water depths, predominantly due to sediment deposits from the Snohomish River. The most recent dredging occurred in 1990 and 2001. The 1990 event involved dredging throughout the North Marina area adjacent to the shipyard except in the immediate vicinity of the marine railway and floating dock to the north. This dredging resulted in water depths of -10 to -13 feet mean lower low water (MLLW) in the area offshore of the shipyard. The 2001 event was more limited in scope, as it did not include any dredging south of the floating dock and marine railway, but did include some dredging in the vicinity of the Port's Travel Lift boat haul out facility northwest of the shipyard. The 2001 dredging resulted in typical water depths of -11 to -14 feet MLLW in the area north of the floating pier.

The Port's Travel Lift boat haul out facility and adjacent areas were routinely used by the Port tenants or customers for vessel washing, painting and other maintenance. The Port's haul-out facility was present when ESY began operating at the Site in 1959 and consisted of a fixed crane used to remove boats from the water in the late 1950s and early 1960s. The Port's current Travel Lift is evident in aerial photographs beginning in 1965. In 1996, the Port constructed a nearby closed loop boat wash facility.

Historically, the Port also operated a tidal grid facility in the nearshore area south of the marine railway. According to Port personnel, the grid was used by boat owners for washing ships' hulls, painting and other maintenance activities. The tidal grid (or boats positioned on the grid) is evident in aerial photographs dated 1969, 1974, 1978 and 1991. The tidal grid was removed prior to construction of the new east bulkhead in 1995.

The 1950 Sanborn Map shows a net dipping operation located just south of the former fish processing building and north of the eastern end of the Net Shed building. A portion of the net dipping operation is depicted on the 1957 Sanborn Map. The net dipping operation is not depicted on the 1968 Sanborn Map. The net dipping facility was located outside of the former Everett Shipyard Lease Area, and the operators of the net dipping facility were likely commercial fishermen who leased the net sheds from the Port. No information has yet been located regarding the types of chemicals that were used in this operation.

Facility Operations

Since the founding of Fishermen's Boat Shop in 1947, the Site was used for building wooden fishing boats and yachts, cleaning, painting, and repairing marine vessels. Fishermen's Boat Shop became a corporation in 1961. In January 2002, Fishermen's Boat Shop changed its corporate name to Everett Shipyard, Inc. In April 2008, Everett Shipyard Inc. changed its name to ESY, Inc. The facility conducted repair work on marine vessels up to 110 feet long. Abrasive grit blasting and welding were added as marine repair activities. The repair work involved bilge evacuations via vacuum trucks for off site disposal, equipment disassembly, abrasive blasting, woodwork and metalwork, painting/coating, and mechanical repairs. The operations did not include engine repairs; this work was sent off site.

Chemicals used on as part of the operations at the Site included paint and polymer coatings, coating strippers, paint thinner, rust preventer, creosote, anti-biofouling agents, xylene, diesel, lubricants, hydraulic fluid, fuel oil, and other petroleum products. Bottom paint used at the Site in 1992 (Ecology, 1992a) contained copper in the form of cuprous oxide.

Abrasive blasting at the Site was performed by sub-contractors for specific projects. Grit used for abrasive blasting historically included the use of copper slag. The grit used included "Green Diamond" and "Kleen Blast." Historically, the grit remained on site and was removed when it accumulated to the point that it interfered with Site operations. Aerial photographs suggest that abrasive grit was historically present on the ground surface throughout most of the central and southern portions of the Site. The apparent maximum lateral extent of the grit based on aerial photographs is depicted on Figure 1-2. Grit was removed from the site at more regular intervals when contractors performing abrasive blasting were requested to remove the grit following each project. During the Site inspection completed by Ecology in 1992, significant quantities of abrasive grit were evident on the ground and in an open bag at the Site. While not obvious on aerial photographs, abrasive grit and paint chips have occasionally been observed near the upland portion of the marine railway because maintenance activities, such as scraping paint off of the bottom of a boat and abrasive blasting, occurred in this area. A recent incident in which this occurred is described below.

In January 2009, Port staff observed Everett Shipyard maintenance activities being conducted on a large boat (the MV Kirkland) near the bulkhead (Port of Everett, 2009). The boat was reportedly too wide to haul it all the way to the wash pad, which is why Everett Shipyard had to work on the boat in close proximity to the bulkhead. The Port observed that boat maintenance debris consisting of paint chips and other waste had been scraped off of the boat and deposited on the pavement surface within an area where stormwater overland flow discharges directly into the marina. The Port collected a sample of the boat scrapings from the ground surface on the south side of the marine railway. Test results revealed detected concentrations of barium, copper, lead, zinc, and TBT above MTCA and/or SMS cleanup levels (Port of Everett, 2009). Ecology's Water Quality program was notified of the incident indicating a potential violation to their National Pollution Discharge Elimination System (NPDES) permit (permit number WA-003096-1).

Handling of Stormwater and Surface Runoff Water

Historically, stormwater from the Site was managed primarily via infiltration. Operation areas surrounding the skids (side tracks) in the southwestern and central potions of the Site were maintained at an elevation below the surrounding grade level to facilitate access to the boats in the shipyard. In addition, the concrete footings for the westernmost skids form a nearly continuous barrier to surface water flow along the western boundary of the Lease Area. Although the concrete footings may form a type of barrier, it is noted that prior inspections at the Site conducted by Ecology in 1992 revealed extensive occurrence of sand blast grit on the ground (characterized as piles of sand blast grit), including evidence of spills. As such, some portion of the spent or spilled sand blast grit described above may have migrated beyond the concrete footings towards the marina via particulate migration through air or poor housekeeping practices, and then via surface water overland flow to the marina. It's noted that sand blast grit located beyond the concrete footings was identified during the RI and Ecology directed the PLPs in February 2010 to place this sand blast grit inside the current fenced area of the Site.

Soil at the Site consists of silty, sandy fill (Landau, 2003) which appears, based on site observations (evidence of ponding, but limited overland flow in unpaved areas), to be conducive to infiltration throughout most of the unpaved portion of the Site. Everett Shipyard personnel also reported that the unpaved road that historically bordered the Site on the west and south had a "crown" in the middle that would generally minimize overland flow from crossing the road except during heavy precipitation periods. The conditions described above may have helped reduce the impact from surface water runoff from these areas of the Site.

Everett Shipyard personnel also reported that these unpaved roads surrounding the Site were sprayed with oil by others to suppress dust. This was a common industry practice at many facilities throughout the country until the early 1980s when potential environmental impacts associated with this practice became widely known.

Catch basins were eventually installed at the Site as shown on Figure 1-3, but the date of installation is not known. Catch basins that collected stormwater from within Everett Shipyards operational area discharged into the North Marina at Outfalls 001 and 002 located north and south of the Marine Railway, respectively. Outfalls A and C were reported by Landau (2003) to have been connected to historic storm drains and catch basins located north and south of the Lease Area, respectively. Outfall B is reportedly connected to a series of catch basins located west and south of the operational yard.

In 2002, Everett Shipyard reconfigured the catch basin discharge in the operations area to discharge to the sanitary sewer. Outfall 002 has not been used since 2002 and the only storm water that discharges directly to Outfall 001 is limited to roof run-off from the weld shop. ESY also constructed a sump to catch wash water from boats being washed on the marine railway. The collection sump for the wash down facility discharges to the sanitary sewer. Following the reconfiguration of the catch basins and the installation of the collection sump, the only stormwater runoff that entered the North Marina from the Site was runoff from a small area, primarily north of the marine railway which includes discharges from Outfall A.

In June 2008, Port staff observed a deposit of soil-like material near the bulkhead adjacent to the Everett Shipyard marine railway. The deposit was located on the pavement surface within an area where stormwater overland flow discharges from the Everett Shipyard leasehold directly into the marina. Sampling and analysis of this material (conducted by the Port) indicated that it contained 70 mg/kg of arsenic (Landau, 2008) which exceeds the MTCA Method A soil cleanup level. Other metals were detected at concentrations below their respective MTCA cleanup levels. To address the stormwater runoff issue in this area, Everett Shipyard performed the following:

- In July 2008, a catch basin was installed on the northern side of the marine railway adjacent to the bulkhead. The catch basin was equipped with a sump pump that transferred water to the collection sump which discharged to the sanitary sewer.
- An asphalt berm was constructed along the bulkhead to divert water into the catch basin and minimize the potential for surface water discharge into the North Marina.

It is noted that prior to the installation of the catch basin, Everett Shipyard improved housekeeping in this area by sweeping up all loose materials in the vicinity of the marine railway and removing a small quantity of residual soil/sediment (less than one cubic foot) that had collected in the approximate location of the newly installed catch basin.

Storm water monitoring was performed at that Site in accordance with NPDES permit requirements from the late 1990s through 2009. Site stormwater features are shown on Figure 1-3.

Operation of Subleased Facilities

In addition to the Everett Shipyard operations, Everett Engineering subleased three buildings at the Site. Buildings were constructed for Everett Engineering's operations between 1966 and 1984. The buildings included: the office/machine shop, Building 7 and Building 9. The operations in the office/machine shop building started in the late 1960s and activities in all three buildings ceased in 2007. Another tenant occupied Building 7 and the office/machine shop building between 2008 and 2009. The buildings were vacant by November 2009. Past operations in these buildings have included the use of cutting oils, lubricant oils, hydraulic fluids and solvents (see Table 1-1). Special foundations for heavy equipment, including a foundation slab below the floor grade, were observed in Building 9.

Based on review of historical city directories, land ownership maps, and buildings plans and permits, other tenants of the subject property have included: Northwest Propeller and Aquatic Industries.

1.3.3 Previous Investigations and Limited Interim Actions

This section briefly describes the scope of the investigations and cleanup actions completed prior to the effective date of Agreed Order No. DE 5271. A complete discussion of soil, groundwater and sediment investigation results for the Site is included in Sections 3.0 and 4.0. Additional investigation of storm drain sediment and surface water was not conducted during the RI and therefore the results of these investigations are presented in this section.

Fishermen's Boat Shop Independent Cleanup Action - 1988/1989

Soil sampling conducted by Ecology in 1987 (Ecology, 1992a) detected copper, lead, and zinc contamination reportedly resulting from abrasive grit waste east of the wood shop area. In response to Ecology's findings, Fishermen's Boat Shop reportedly excavated the grit and underlying soil in the area surrounding the wood shop. The approximate limits of the excavation as reported by Everett Shipyard personnel are shown on Figure 1-2. According to Everett Shipyard personnel, the excavation was extended 1 to 2 feet into the underlying soil to facilitate drainage to a catch basin that was installed in this area and to allow for placement of a thick layer of asphalt needed to support heavy equipment. Confirmation soil sampling following the excavation was reportedly not performed and there is no written documentation regarding this interim cleanup action.

Ecology Site Inspections - 1992

During Ecology's April 1992 site inspection, the facility was found to be a "large-quantity generator" of hazardous waste. Abrasive grit was observed on the ground, near storm drains, and inside storm drains. The facility was subsequently cited for spills and discharges into the environment. Shipping papers maintained by the facility indicated that regulated wastes (sludge, paint thinner, paint, oil, paint solids, xylenes, methyl ethyl ketone, etc.) were disposed from the Site, but lacked waste manifests. Ecology found that Everett Shipyard was discharging water from a building wash sink directly to the stormwater system that was connected to an outfall that discharged into the bay (North Marina). This discharge was ceased in May 1992. Ecology also documented a spill of lead-acid battery liquid and a spill of creosote from a dispenser and some soil staining associated with these spills.

Landau Phase I Environmental Site Assessment - 2001

In 2001, Landau completed a Phase I Environmental Site Assessment (ESA) of the North Marina property for the Port. The North Marina property covers approximately 65 acres of uplands and 35 to 45 acres of intertidal and subtidal areas, including the Site.

At the time of the site reconnaissance, tenants at the Site included Fishermen's Boat Shop and Everett Engineering. Creosote treated timbers, surface stains, abrasive grit, and paint chips were noted during the site reconnaissance. Quality Seafoods was located to the southeast. The adjacent tenant to the north was Harbor Marine Maintenance, a boat storage and repair facility. Everett Bayside Marine, a boat maintenance and sales facility located north of the Port's Travel Lift, was identified as a possible source of groundwater contamination related to releases from underground storage tanks (USTs). Small surface stains in areas where hazardous substances were used and stored were observed at both the Harbor Marine Maintenance and Everett Bayside Marine sites.

The Phase I ESA summarizes the Ecology Site inspections conducted in 1992 and described above. Ecology files also contained records related to the stormwater discharge permit (NPDES Permit No: WA-003096-1). A water compliance report in Ecology's files dated August 28, 1996 described a pressure wash water collection and recycling system. Water from the wash pad at the head of the marine railway was collected in a vault, treated and then discharged to the sanitary sewer. Stormwater in excess of the storage capacity was discharged through Outfall 001. According to the report, Outfall 002 was no longer functioning. Ecology's records also contained information related to decommissioning of a 400-gallon leaded gasoline UST in 1990. The UST (Ecology Site ID 972) was formerly located south of the weld shop and east of the wood shop (Figure 1-2) and was in use from 1964 to October 1989. According to the Ecology UST closure form dated August 14, 1990, a site assessment was completed to permanently close the tank and no residual contamination was found.

Landau concluded that visual observations and records indicated that the Site will likely have a significant volume of upland soil and subtidal sediment that may require special handling during redevelopment. Hazardous substances that may have impacted soil, sediment and groundwater included metals, organotins, volatile organic compounds (VOCs) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

Landau Phase II Environmental Site Assessment - 2003

In 2003, on behalf of the Port, Landau Associates conducted a Phase II ESA to determine whether historical and current industrial site activities may have resulted in releases of hazardous substances to Site media (e.g., soil, ground water, adjacent marine sediment) and whether any cleanup was warranted. The investigation included fourteen shallow soil samples, installation and sampling of three monitoring wells (MW-1 through MW-3), groundwater sampling within four borings, storm drain sediment sampling and six marine sediment samples. A summary of the soil, groundwater and marine sediment analytical results is presented in Section 4.0.

Five catch basin sediment samples were collected during this investigation were analyzed for total metals and bulk tributyltin (TBT). The results are summarized in Table 1-2. The analytical results were compared to both the MTCA cleanup levels and the state Sediment Management Standards (SMS), because of the potential for release to the marine environment. Exceedances of one or both standards were found for arsenic, copper, and zinc in every sample. Select samples also had exceedances for cadmium, lead, and mercury. All samples also exceeded the preliminary TBT criterion used in the ESA for screening the marine sediment results.

Landau Sediment Quality Investigation - 2004

In 2004, Landau collected additional marine sediment samples from the North Marina area. Five shallow grab samples and three cores were collected in the area just west of the shipyard. One grab was collected in the general vicinity of the former Port tidal grid south of the marine railway and the other four grab samples were collected in the general area of the Port's Travel Lift dock and boat wash facility at the north end of the bulkhead. A summary of the analytical results for this sediment investigation is presented in Section 4.3.

URS Limited Soil Investigation - 2007

URS conducted a limited investigation of shallow soil in the southwestern portion of the Site to further assess the extent of elevated concentrations of petroleum hydrocarbons and metals concentrations detected in the shallow soil by Landau (2003). The investigation included collecting soil samples from 29 shallow hand auger boring locations on the Site and at off site locations north and south of the Site to evaluate background conditions. The results of this investigation are presented in Section 4.1.

Surface Water Monitoring - 1999 to 2008

Storm water monitoring has been performed by ESY at Outfall 001 from at least 1999 to 2003 in accordance with the requirements of the Industrial Storm Water Discharge permit (NPDES Permit No.: WA-003096-1). Available records include samples collected at approximately monthly intervals between December 1999 and September 2002. The samples were analyzed for copper, lead, zinc, oil and grease, TPH, turbidity. The background turbidity in the receiving water was also tested. As described above, in 2002 the stormwater discharge from the Site was diverted to the sanitary sewer and therefore the monthly monitoring was no longer required. Available monitoring results are summarized in Table 1-3 and indicate that copper, lead, and zinc frequently exceeded marine chronic ambient water quality criteria (e.g., 26 out of 27 sampling dates). Oil and grease were occasionally detected in samples collected in 1999, 2001, and 2002 in excess of levels identified in the NPDES permit.

Beginning in 2001, surface water samples were also collected on an approximately quarterly basis when a ship was launched at the marine railway after undergoing repairs at the shipyard. The samples were analyzed for oil and grease and TPH. Available results are summarized in Table 1-4. With the exception of a single sample collected in 2007, oil and grease and petroleum hydrocarbons were below the reporting limits (5 milligrams per liter [mg/L]) in the samples.

Additional Investigations and Cleanup Actions

Areas of contaminated soil have been identified at other nearby sites in the North Marina (Landau, 2005). Some these documented releases of hazardous substances occurred on properties northeast of the Port's Travel Lift boat haul-out area. Several outfalls have been observed along the bulkhead in the portion of the marina near the Travel Lift (Figure 1-3). Utility drawings confirm that some of these outfalls were connected to catch basins on the properties where soil contamination was identified. Therefore, releases related to these operations located north of the Site may have contributed to sediment impacts in the North Marina.

1.4 FUTURE LAND USE

The City of Everett zoning map (City of Everett, 2008) identifies the zoning of the Site as Waterfront Commercial which does not fit within MTCA's characteristics of Industrial Land Use. The Port has prepared a preliminary redevelopment plan and has a development agreement with the City of Everett that states the Site will be used for commercial and public access uses which could include commercial development such as professional office space and retail shopping. The Port indicated that it may seek a modification to the agreement to allow for a different mix of uses, including residential.

The Port intends to redevelop the Site, but the timing of the redevelopment is uncertain. Following redevelopment, it is anticipated that a large portion of the Site would be covered with buildings or pavement. However, opportunities for green/low impact development will be looked at including the incorporation of additional landscaped areas where possible to help minimize the amount of stormwater runoff that would need to be managed . Current redevelopment plans include an upgrade to the stormwater system to a "State of the Art" filter system. Future use of the Site for heavy industrial purposes is not anticipated at this time, and would not be allowed under the current zoning code.

2.0 SITE AREA INVESTIGATIONS

The goal of the RI/FS process is to collect and evaluate information sufficient to select a cleanup action consistent with the requirements of WAC 173-340-360 through WAC 173-340-390. The specific rationale and site characterization activities conducted for the upland and marine sediment investigations are described below. Field activities were conducted between November 2008 and July 2010 in accordance with the *Final RI/FS Work Plan* (URS, 2008) and subsequent work plans (URS, 2009b, 2010b, 2010c, and 2010d).

The RI field investigations were conducted in three phases. The initial phase of the work began in fall 2008 and was designed to identify the nature and extent of contaminants and toxic effects in upland areas and within marine sediment. The results of this investigation were presented in URS' *Preliminary RI Data Report* (URS, 2009a). Subsequently, additional investigations were proposed in the *Supplemental RI Work Plan* (URS, 2009b) to further evaluate the nature and extent of contamination after consultation and agreement from Ecology. The second phase of investigation was performed in summer and fall 2009 and the results were presented in the *Preliminary RI Phase II Data Submittal* (URS, 2010a). Ecology identified sediment characterization data gaps in the vicinity of Outfall C in the southwestern portion of the Site and near the bulkhead adjacent to the Port's Travel Lift and boat haul-out in the northeast corner of the North Marina. The third phase of work included additional investigation of sediment, soil and groundwater in these areas between May and July 2010. Preliminary analytical results for these investigations were submitted to Ecology in the *Phase III Upland Work Plan* (URS, 2010c) and *Phase III Upland Investigation Results and Geophysical Survey Work Plan* (URS, 2010d). Data quality memoranda for the Phase III investigation results are included in Appendix A.

The soil, groundwater and sediment sampling methods and procedures implemented during the RI, including sample handling and quality assurance and quality control (QA/QC) measures, were conducted in conformance with the Sampling and Analysis Plans (SAPs) presented in the *Final RI/FS Work Plan* (URS, 2008) and subsequent work plans (URS, 2009b, 2010b, 2010c, and 2010d). During implementation of field activities, field data were assessed to determine whether adjustments/modifications to the work plans were appropriate to maximize the quality and usefulness of the investigation. Deviations from the work plans are described within the applicable sections.

2.1 SOIL INVESTIGATION

The objectives of the soil investigation were to better define the nature and extent of the shallow soil contamination previously detected on the southwestern portion of the Site in 2003 (Landau, 2003) and 2007 (URS, 2007b) and to further investigate other areas of the site to determine whether significant releases of hazardous substances occurred in these areas.

To accomplish these objectives, soil samples were collected at locations shown on Figure 2-1. The rationale for the soil sampling program completed as part of the RI is summarized in Table 2-1. Prior to implementing the RI soil investigation field activities, the One Call utility notification service was contacted to mark public utilities within the investigation area. URS contracted Applied Professional Services, Inc. of North Bend, Washington, to perform utility clearances within the property boundary. URS also consulted with ESY and Port personnel regarding the proposed boring locations.

The drilling program was performed by a licensed well drilling contractor, Cascade Drilling of Woodinville, Washington. The initial field drilling program was completed from December 1, 2008 through January 21, 2009 and the supplemental investigation was performed from October 26, 2009 through November 25, 2009. The soil boring and shallow sample locations were advanced using either hydraulic push (e.g., Geoprobe) or hollow-stem auger drilling methods. Due to limited access conditions and/or shallow sampling depth intervals, several locations were sampled using a decontaminated stainless-steel hand auger in accordance with a protocol approved by Ecology (Ecology, 2008b). The hand auger technique included using a spade or post-hole digger to enlarge the diameter of the boring after the hand auger had been advanced to the initial sample depth interval to reduce the likelihood of "cross-contamination" from the overlying interval.

The hydraulic push and hollow-stem auger drilling and sampling equipment were decontaminated between each boring location using a steam cleaner. Other sampling equipment was decontaminated in accordance with the SAP (URS, 2008). Monitoring of drilling and soil sampling activities were conducted by a qualified URS geologist or engineer. Investigation derived waste (e.g., soil cuttings, decontamination water and well development water) was placed in labeled 55-gallon steel drums.

2.1.1 Shallow Soil Samples

During URS' 2007 investigation (URS, 2007b), shallow surface soil samples were collected at twenty nine locations (SS-1 through SS-29) in the unpaved central and south western portion of the Site. During the RI, shallow soil samples were collected at nine locations (SS-30 through SS-38) within the unpaved southwest portion of the Site where abrasive grit was evident and from three locations (SS-39 through SS-41) from the paved central portion of the Site to assess the effectiveness of the undocumented cleanup (Figure 1-2).

Shallow soil sample locations SS-30 through SS-38 were collected at depths of 0.0 to 0.5 feet bgs. Sample locations SS-39 through SS-41 were collected slightly deeper due to the presence of asphalt at the surface. The sample depths are summarized in Table 2-2. Twelve shallow soil samples were submitted for analysis for diesel- and oil-range petroleum hydrocarbons (TPH), cPAHs, and 13 priority pollutant metals. Samples at SS-33 and SS-37 were additionally analyzed for organotins, SVOCs and PCBs, and a sample from SS-41 was additionally analyzed for SVOCs and PCBs. Specific analytes, analytical methods and detection limits were outlined in the Quality Assurance Project Plan ([QAPP] Appendix G of the *Final RI/FS Work Plan*, URS, 2008).

Deviations or modifications to shallow soil sampling activities from the *Final RI/FS Work Plan* and *Supplemental Field RI Work Plan* (URS 2008, 2009b) were as follows:

- SS-39, SS-40 and SS-41 were proposed to be sampled by hand auger. Due to asphalt at the ground surface, a direct-push drill rig was used to collect the samples below the asphalt and base course material.
- Two deeper samples were collected at SS-39 upon noting hydrocarbon odor at the bottom of the original sampling interval.
- One deeper sample was collected at SS-41 due to the presence of abrasive grit at the bottom of the original sampling interval.

2.1.2 Soil Boring Samples

One hundred and fourteen soil borings (SB-1 through SB-107, and MW-4 through MW-10) were advanced across the Site. The sampling location rationale is summarized in Table 2-1 and the boring locations are shown on Figure 2-1. Soil samples were collected and field-screened consistent with the procedures outlined in Appendix E of *Final RI/FS Work Plan* (URS, 2008). The soil conditions and field screening results for each boring were documented on a boring log and the logs are presented in Appendix B. Samples were collected at depths and analyzed for constituents identified in the work plans (URS, 2008, 2009b). In addition, samples selected for discretionary analysis consisted of stained soils, samples containing abrasive grit, samples collected directly above the water table in areas of potential or known solvent use/storage, samples with a hydrocarbon odor, and/or samples with elevated photo-ionization detector (PID) readings. Following sample collection and lithologic logging, soil borings were backfilled with hydrated bentonite chips and the surface restored with asphalt or concrete, depending on the location.

Table 2-2 summarizes the soil boring sampling program from 2003 through 2010, including the analytical testing parameters and sample depth intervals. If asphalt or concrete pavement was present at the sampling location, then the sampling depth was modified so that the first sample (identified as 0.0 to 0.5 feet bgs) was collected directly beneath the pavement and underlying base course material and the sample depth for deeper samples were adjusted downward, consistent with the intervals specified above. Soil samples were also collected and analyzed at other depth intervals when field screening (e.g., visual observations such as staining or the presence of abrasive grit, olfactory evidence or elevated PID readings) indicated that additional sampling would provide information regarding the extent of the apparent contamination. Specific analytes, analytical methods and detection limits were outlined in the QAPP (Appendix G of the *Final RI/FS Work Plan,* URS, 2008).

Generally, the shallow sample in each boring was analyzed for diesel- and oil-range petroleum hydrocarbons, cPAHs, and/or metals based on field observations and protocol established in the *Final RI/FS Work Plan* (URS, 2008). Preliminary screening levels (PSLs) were developed as part of the RI/FS work plan. If any of the analyzed constituents were detected above the PSLs (Appendix C) in the shallow sample, then the next deeper sample was analyzed for the compounds/analytes that exceeded their respective PSLs. Note, the PSLs for metals in soil were adjusted to reflect background concentrations where applicable in making the decision to sample the next deeper sample. Contingent analysis of progressively deeper samples continued until results were below the PSL level or until the deepest sample from a boring location was analyzed.

Deviations or modifications to soil sampling activities from the *Final RI/FS Work Plan* and *Supplemental Field RI Work Plan* and the *Phase III Upland Work Plan* (URS, 2008, 2009b, and 2010c) included:

- SB-6 was relocated east of SB-7 due to access limitations.
- SB-24 was sampled in January 2009 using a hand auger following an initial attempt to sample this location in December 2008 using the direct-push drill rig. Manual sampling was used to better co-locate SB-24 with the SS-5 sample location on the basis of visual hydrocarbon impacts.
- SB-25 was sampled in January 2009 using a hand auger because this location was not accessible using the direct-push drill rig in December 2008.
- SB-48 through SB-52 were re-located from the proposed locations due to accessibility issues with City of Everett construction of the West Marine View Drive sidewalk. SB-48 through SB-52 were sampled in November 2009 following a hand auger procedure similar to that used for SB-25.
- At SB-62 through SB-71, SB-73, SB-74, and SB-88 through SB-90, additional samples identified with the suffix '-SS' were collected immediately below the concrete slab in base course materials to assess the extent of impacts detected in deeper samples.
- Boring SB-99, located adjacent to the Mall Building was not drilled due to access constraints; two additional borings (SB-93A and SB-107) were drilled in this area based on field observations.

2.1.3 Geophysical Survey

The objective of the geophysical survey was to assess whether former or existing underground storage tanks (USTs) or other features (e.g., buried drum) are present within the area of petroleum impacted soils located east of the Port of Everett Travel Lift/Boat Haul-Out bulkhead (Figure 2-1) which could be a potential source of the contamination noted within this area. To accomplish this objective, surface geophysical surveys were performed which included both a magnetometer and ground penetrating radar (GPR) survey. The surveys were performed in conformance with the *Phase III Upland Investigation Results and Geophysical Survey Work Plan* (URS, 2010d).

URS retained Global Geophysics of Monroe, Washington to complete the geophysical survey using a Geometrics Cesium magnetometer and a Geophysical Survey Systems, Inc. SIR 2000 GPR system. The survey was performed on July 28, 2010. The survey area is depicted on Figure 2-1 and included the general area of petroleum impacts and the area south of the Harbor Marine building that appears to have been developed with a former building in 1961 based on an aerial photograph provided by the Port.

A survey grid was established over the study area and the spacing between transects was approximately 5 feet. The magnetometer survey was performed to identify potential metallic anomalies and the GPR survey was then be completed to ascertain the subsurface profile in the areas of the metallic anomalies. The geophysical survey methods and procedures are presented in Global Geophysics report (Global Geophysics, 2010) provided in Appendix D.

2.2 GROUNDWATER INVESTIGATION

The objectives of the groundwater investigation were to further assess whether groundwater quality beneath the Site has been affected by site operations and to confirm the direction of groundwater flow. To accomplish these objectives, seven new groundwater monitoring wells (MW-4 through MW-10) were installed. Groundwater sampling and analysis was conducted and groundwater level measurements were collected from new and existing wells. In addition, grab groundwater samples were collected and analyzed from seven direct-push borings. Drilling and sampling equipment was decontaminated in accordance with the SAP (URS, 2008).

2.2.1 Monitoring Wells

The new monitoring wells were installed on December 8 and 9, 2008, by Cascade Drilling Inc., a Washington licensed well driller. The monitoring wells were installed using hollow-stem auger drilling methods and were constructed in conformance with Ecology's Resource Protection Well requirements (WAC 173-160). The boring logs and well construction details are presented in Appendix B. The monitoring well locations are shown on Figure 2-1.

New Well Locations

Shallow groundwater beneath the site was inferred to flow westerly (URS, 2008) and the well locations were selected on this basis. Monitoring wells MW-4, MW-5, and MW-6 were installed west (downgradient) of the areas where elevated levels of petroleum hydrocarbons and metals were detected in soil during the 2007 soil investigation. MW-7 and MW-8 were located downgradient of the Everett Engineering buildings to assess potential impacts related to operations within these buildings and historic operations prior to building construction. MW-9 and MW-10 were located along the eastern property boundary to provide additional water level data and upgradient groundwater water quality.

The monitoring wells were completed roughly between 2.5 to 12.5 feet bgs and were constructed with a 10-foot section of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) well screen (0.020" slots). The annular space was filled with 2-12 sand as filter pack from the bottom of the borehole to approximately 2 feet above the screened interval and the remaining annular space was filled with bentonite. The well was completed with a locking cap and flush mounted vault. A licensed surveyor, Bush, Roed & Hitchings, Inc. surveyed the well coordinates and top of casing elevations of the new and existing site monitoring wells. Well construction details are summarized in Table 2-3.

The monitoring wells were developed within one week following installation by purging with a whale pump and monitoring discharges with a multi-parameter field meter until water quality parameters (e.g., pH, conductivity, dissolved oxygen, turbidity and temperature) were stable and turbidity was minimal.

Groundwater Sampling

Groundwater samples were collected from two existing monitor wells (MW-1 and MW-2) and the seven newly installed monitor wells on January 6 and April 1, 2009. As described in the *Preliminary RI Data Report* (URS, 2009a), MW-3 could not be located and therefore was not sampled. The timing of the sampling events was selected to correspond with a low tide so that the samples were representative of Site conditions. Water level measurements were made for each well before and after groundwater sampling to assess the degree of water level variation in response to tidal fluctuations. The groundwater samples were collected using low-flow sampling methods (URS, 2008) and the field parameters (e.g., pH, conductivity, dissolved oxygen, turbidity and temperature) and other pertinent sampling information were recorded on groundwater sampling log forms which are presented in Appendix E.

Samples collected from the monitoring wells during the January and April 2009 sampling events were analyzed for total dissolved solids (TDS), diesel- and oil-range petroleum hydrocarbons, total and dissolved RCRA metals, organotins, SVOCs (including PAHs), PCBs, and VOCs (Table 2-4). Specific analytes, analytical methods and detection limits were outlined in the QAPP (Appendix G of the *Final RI/FS Work Plan*, URS, 2008). Based on the results of the initial two rounds of groundwater sampling, two additional groundwater sampling events were conducted in July and October 2009 at monitoring wells MW-2, MW-4, MW-6, and MW-7 due to the inconsistency between earlier results to confirm indicator hazardous substances for groundwater. These groundwater samples were analyzed for total and dissolved metals (arsenic, copper and zinc) and SVOCs (Table 2-4).

The following modifications/deviations to the Work Plan occurred during groundwater sampling activities:

- A depth to water measurement at MW-10 was not collected following sample collection January 6, 2009 due to blocked access.
- MW-6 could not be sampled or accessed for depth to water measurement on July 9, 2009 due to the presence of a barge located over the well.
- A depth to water measurement at MW-9 was not collected October 13, 2009 during the initial sweep of measurements due to a malfunction with the water level indicator.

Abandonment of MW-9

Up-gradient monitoring well MW-9 was decommissioned in-place on October 29, 2009 upon the request of the City of Everett and with approval from Ecology. The City of Everett was in the process of expanding and improving the West Marine View Drive right-of-way with a 17-foot wide sidewalk, and well MW-9 was located in the path of these activities. Cascade Drilling abandoned the well by backfilling the well casing with hydrated bentonite chips in a manner consistent with WAC 173-160.

2.2.2 Groundwater Grab Samples

To assess the potential presence of localized areas of groundwater impacts, shallow grab groundwater samples were also collected from the direct-push soil borings at the following locations:

- SB-1 and SB-2, located east of the wood shop to assess groundwater conditions beneath the area that was reportedly cleaned up in the late 1980s;

- SB-7, SB-8, SB-9 within the Everett Engineering buildings to asses groundwater quality near floor penetrations where staining was evident on the building floor and to assess potential impacts related to historic operations prior to building construction;
- SB-19, located in the eastern portion of the weld shop to assess potential releases from the weld shop and historic operations in this area prior to construction of the eastern addition to the weld shop;
- SB-43, located near former monitoring well MW-3; and
- SB-93, SB-94 and SB-95 located near the bulkhead southeast of the Port's Travel Lift.

Prior to sampling, each temporary well was purged using a peristaltic pump at a slow rate (less than 300 mL/minute) until the discharged was low in turbidity and had minimal suspended solids. Field parameters were also monitored. Groundwater samples from these borings were analyzed for petroleum hydrocarbons and dissolved metals. Two samples collected from inside existing buildings (SB-7 and SB-19) were also be analyzed for VOCs. The sample from SB-43 was analyzed for dissolved metals (arsenic, copper, nickel and zinc) and SVOCs. Samples for dissolved metals were filtered in the field using a disposable in-line filter. Following sample collection, direct-push sampling equipment was removed from the boring, and the soil boring was backfilled with hydrated bentonite chips, consistent with other direct-push soil borings sampled across the Site.

2.3 CATCH BASIN INVESTIGATION

On February 27, 2009, catch basins were visually inspected to estimate the volume of accumulated solids present and dye tested to confirm connectivity to outfalls discharging to the North Marina. Twenty-four catch basins that may receive storm water runoff from the Site were identified on a Port of Everett base map, as shown on Figure 1-3. Twenty-two of these catch basins were identified; the remaining two could not be located and were presumably removed, buried or covered by asphalt. The volume of accumulated solids within catch basins was estimated by measuring the lateral dimensions of each catch basin and the approximate thickness of the accumulated sediment.

Flow through the catch basins was controlled by applying potable water from a hose to each catch basin and using a fluorescent dye, where necessary, to confirm the direction of flow and the receiving outfall. URS notified Port personnel and City of Everett prior to performing this test.

2.4 MARINE SEDIMENT INVESTIGATION

The objectives of the marine sediment investigation were two-fold. Limited sediment investigations in 2003 and 2004 documented the presence of contaminants in sediments, primarily in the vicinity of the marine railway and in the nearshore area to the north of the railway. However, these historical results were not sufficient to fully define the nature and extent of contaminants in these areas. One of the primary objectives of the RI investigation was to close this data gap.

The second objective of the RI sediment investigation was to characterize sediment areas not included in the prior investigations but which may have been impacted by ESY or other nearby operations. These areas consisted of the sediments adjacent to the bulkhead between the marine railway and Outfall C at the south end of the Site, the nearshore sediments between Outfall A and the Port of Everett's Travel Lift boat haul out, and along the bulkhead running west from the Travel Lift.

Two phases of RI sediment sampling were performed to accomplish these objectives. The sampling locations are shown on Figure 2-2 and described below. The sediment sampling methods and procedures were performed in conformance with the *Final RI/FS Work Plan* (URS, 2008), the *Supplemental RI Work Plan* (URS, 2009b) and the *Draft Supplemental Phase III Remedial Investigation Work Plan* (URS, 2010b). Sampling equipment was decontaminated between each sampling location consistent with the procedures described in the SAP (URS, 2008).

2.4.1 Sediment Grab Samples

Shallow sediment grab samples were collected from 0 to 10 cm at 27 locations (SG-1 through SG-27) during the initial phase of RI sampling in February 2009. Based on the initial sampling results, eight additional shallow grab samples (SG-28 through SG-35) were collected during the second phase of RI sampling in October 2009. Based on the Phase II findings, an additional eighteen shallow grab samples were collected in a third phase of RI sampling conducted in May and June 2010. In addition to sampling of sediments within the North Marina (locations SG-36 through SG-47), this third phase of sampling also included sampling of the sediment material between the dual bulkheads in the northeast corner of the North Marina (locations BC-1 through BC-6). The Phase III sampling also included the collection of subsurface grab samples at the six original bulkhead sampling locations and from four additional bulkhead locations (BC-7 through BC-10) as shown on Figure 2-2.

Aside from the bulkhead samples collected in May and June of 2010 using manual methods, the majority of the sediment grab samples were collected from a marine research vessel using a 0.1 square meter van Veen grab sampler. At locations SG-1, SG-15, SG-16, SG-23, and SG-34, grab samples were collected by URS from shore using a Petit Ponar sampler as these locations were not accessible to the marine vessel. URS field personnel monitored the sediment sampling activities and maintained a log of the sediment characteristics. With exceptions noted below, most of the grab samples were submitted for analysis for the 47 chemical criteria and the sediment conventional variables listed in the Washington State Sediment Management Standards (SMS), as well as for organotins (both bulk and porewater). A summary of the marine sediment sample analyses is provided in Table 2-5. The rationale for the specific sampling location is summarized as follows:

Phase I sampling:

- Phase I sample locations SG-1 through SG-9, SG-18 through SG-22, and SG-24 through SG-27 were selected to better define the lateral extent of contamination in the general area of the marine railway. The samples from locations SG-24 through SG-27 were archived, to be analyzed only if the samples closer to shore (i.e., SG-7, SG-8, SG-18, SG-20, or SG-22) were found to have exceedances of the SMS criteria.

- Sample locations SG-10 through SG-12 were chosen to characterize the sediments presumed to be accumulated along the bulkhead south of the marine railway.
- Sample SG-13, was sited in the vicinity of stormwater Outfall C, where historical sampling results included several non-detected SVOCs with detection limits exceeding the SQS.
- Sample locations SG-14 through SG-17 and SG-23 were selected to characterize sediments believed to be accumulated along the bulkhead north of the marine railway area. SG-14 through SG-17 are located along the bulkhead running north to the Travel Lift and SG-23 is located along the bulkhead west of the Travel Lift.

Phase II sampling:

- Phase II sample locations SG-28 through SG-30 were located around SG-23, with the goal of defining the lateral extent of the chemical exceedances reported for SG-23. These samples were analyzed for SVOCs and TBT.
- Sample SG-31 was collected from the same location where sample SG-13 was collected in RI Phase I. Sample SG-31 was collected for use in performing bioassays in an effort to overrule the limited chemical exceedances found in SG-13, as provided for in the SMS. Sample SG-31 was analyzed for the sediment conventional variables and used in conducting bioassays using *Mytilus, Neanthes,* and *Eohaustorius*.
- Locations SG-32 through SG-34 were established in an arc around location SG-31, to be used if necessary to better define the lateral extent of SVOCs exceeding the criteria in this area if the sediment collected at SG-31 did not pass the bioassays.
- Sample SG-35 was collected at an established reference location in Holmes Harbor, an embayment on the east side of Whidbey Island. This sample was analyzed for the conventional variables and used as a reference sample for the bioassays performed with sample SG-31.

Phase III sampling:

- Phase III locations SG-36 and SG-37 were established at the locations where Phase II samples SG-32 and SG-33, respectively, were collected. A single SVOC exceedance was reported at these two Phase II locations, and the Phase III samples were collected for use in conducting bioassays in an effort to overrule the Phase II chemical exceedances. The samples from locations SG-36 and SG-37 were analyzed for the sediment conventional variables and used in conducting bioassays using *Mytilus*, *Neanthes*, and *Ampelisca*.

- A total of nine samples were collected from locations SG-38 through SG-46, three samples each from three arcs approximately 30, 60, and 90 feet from Phase II locations SG-32 and SG-33. These samples were analyzed for the sediment conventionals and then archived pending the results of the bioassays on SG-32 and SG-33.
- The initial Phase III bulkhead sampling involved the collection of shallow (0 to 10 cm) grab samples and subsurface samples from a depth of approximately 2 to 3 feet from six locations between the two timber bulkheads running from Outfall A north to the Travel Lift and west along the bulkhead to the newer sheetpile bulkhead. The shallow samples were designated BC-1-1 through BC-6-1 and the subsurface samples BC-1-2 through BC-6-2. The shallow samples were analyzed for the sediment conventionals and the full SMS suite. Additional petroleum hydrocarbon (HCID) and NWTPH-Dx analyses were subsequently performed on some of the shallow samples because of evidence of petroleum hydrocarbons observed during the sampling. The subsurface samples from these six bulkhead locations were initially analyzed for the sediment conventionals and mercury, VOCs, and TBT and then archived pending the results of the analyses on the shallow samples from each location. The subsurface samples were subsequently analyzed for the full SMS suite.
- In response to the observations of petroleum hydrocarbons during the initial Phase III bulkhead sampling, four additional locations in the vicinity of locations BC-1 and BC-2 were investigated using manual methods. Subsurface samples were collected from depths of from 0.5 to 4 feet from locations BC-7 through BC-10 and submitted for HCID analyses. Based on the results of the HCID tests, NWTPH-Dx analyses were subsequently performed on several of these subsurface samples.

2.4.2 Core Samples

Six sediment cores (SC-1 through SC-6) were collected using a Vibracore during the February 2009 sampling event (Figure 2-2). URS contracted TetraTech to provide vibracore sampling services. The purpose of these cores was to better define the vertical extent of contaminants in excess of the SMS criteria. The goal was to collect cores to a sufficient depth to reach native material or at minimum a depth of eight feet below the sediment surface. The sediment core locations were generally co-located with a shallow grab sample location. Sediment core logs are presented in Appendix F.

Four cores were collected in the area of the marine railway. SC-1 and SC-2 were established approximately 40 feet from shore and 20 feet north and south of the railway centerline, respectively. SC-3 and SC-4 were established approximately 120 feet from shore and 20 feet north and south of the railway. SC-5 was located in the vicinity of Outfall C, at the south end of the site. Core location SC-6 was established near Outfall A, near the north end of the Site.

A tiered approach was used in selecting core samples for laboratory analysis. Multiple samples were prepared from each core, compositing one or two feet from the deepest portion of the core for the first sample, skipping a one- or two-foot interval, preparing another composite sample, etc. The initial analysis for each core was performed using the deepest sample prepared from the core or a sample immediately below the native material. Remaining samples were to be frozen for archival. If the first sample for a given core exceeded a SMS screening levels, the next higher sample was analyzed, with the ultimate goal of defining the maximum depth of contamination. A summary of the core samples analyses is presented in Table 2-5.

3.0 PHYSICAL CHARACTERISTICS OF SITE

3.1 UPLAND GROUND SURFACE FEATURES

The upland portion of the Site is relatively flat and is about 15 feet above Mean Lower Low Water (MLLW) (Figure 1-3). Some portions of the Site have been historically and are currently paved with asphalt or covered by buildings. The southwestern portion of the Site and the northeastern corner of the Site are unpaved soil/gravel covered. The area directly east of the marine railway and the easternmost part of the Site adjacent to West Marine View Drive are covered by concrete (Figure 1-3).

The in-water portion of the Site includes both intertidal and sub tidal zones within the adjacent marine waters located west of the upland portion of the Site. It also includes an area near the marine railway and one or more outfalls that currently or historically discharge surface water from the upland portion of the Site into the North Marina.

A summary of the existing and former site buildings and operations is provided in Table 1-1. URS conducted a site reconnaissance in April 2008 to evaluate the current site conditions. Current building locations are shown on Figure1-3. The primary structures located on the northern and western portions of the Site and surrounding areas include the following:

- The Port of Everett Travel Lift and Boat Haul-Out area is situated northwest of the Site. The Marine Mall building (Harbor Marine) lies directly east of the haul out area. The roadway and adjacent parking areas are asphalt paved.
- Weld shop/fabrication bay (approximately 12,000 square feet [SF]) formerly used for construction and repair of vessels. The building is constructed on a 6- to 9-inch thick concrete slab in the eastern two-thirds, and on asphalt 4- to 6-inches thick in the western one-third.
- A wood shop (approximately 3,000 SF) located south of the weld shop. The wood shop has wood floors with a crawl space beneath the floor.
- A boat shed located north of the weld shop that includes a room formerly used for hazardous materials storage. The building is constructed on an approximately 9-inch thick concrete slab.
- A two-story office building located north of the weld shop that is heated with fuel oil stored in an AST located on the west side of the building. According to Everett Shipyard personnel, a former UST may also be present near the AST. The office building is constructed on a wooden frame with a crawl space beneath the floor.
- A paint storage shed located west of the Wood Shop.
- A steam box shed, south of the wood shop that includes a small fuel oil AST. The tank fuels a boiler used to steam wooden planks to make them more flexible prior

to use in ship building. A small area of stained soil was observed adjacent to the shed.

- A wood storage shed and utility shed, used for storage in the central part of the yard, west of Building 9.

Vessels were often stored on the wooden skids located southwest of the wood shop where abrasive blasting occurred. The central and southern portions of the Site are unpaved and were used for storage. Accumulations of abrasive grit were often evident in the surface soil throughout most of the unpaved portion of the yard in the area of the current and former skids. Paint chips have also been observed on the ground surface at the Site. A marine railway supported by wood piles extends into the North Marina and was used for hauling vessels from the marina to the shipyard. The winch used to operate the marine railway was located in the wood shop building.

Three buildings (the office/machine shop and Buildings 7 and 9) that were formerly sublet to Everett Engineering are located on the eastern portion of the Site along West Marine View Drive (Figure 1-3). Each of these buildings has a 0.5- to 2-foot thick concrete floor. These buildings are currently vacant and were formerly used as machine shops with a small office on the northern side of the north building. Floors within the Everett Engineering buildings were generally stained with oils but appeared to be in good condition with a few exceptions described below:

- Floor penetrations observed in the machine shop building included an apparent drain and two subsurface features (possibly sumps or vaults) that were welded shut.
- In Building 7, a concrete sub-slab was evident below the floor slab. During the April 2008 site reconnaissance, soil between the two slabs appeared to be stained with cutting oils or another petroleum substance.
- Prior to the April 2008 site reconnaissance, an approximately 15-foot diameter steel plate was reportedly removed from the floor in Building 9 and the underlying soil was exposed. No abrasive grit or petroleum staining was evident on exposed soils. In October 2009, a concrete patch was present at this location.

Stained soil was also observed near the northwest corner of the Everett Engineering Machine shop building near the reported location of a former compressor.

3.2 SURFACE WATER

3.2.1 North Marina

The North Marina is located within the near shore area of Puget Sound, which includes the marine areas of Port Gardner and eastern Possession Sound. The near shore area has been defined to extend to a depth of 90 feet—the approximate limit of the phonic zone in central Puget Sound. The surface water hydrology in this sub-watershed is driven by tidal circulation. Human-made structures such as bulkheads, riprap, dock and piers, and dredging have altered the hydrology in proximity to these features (Battelle et al., 2001). A bulkhead borders the upland areas adjacent to the Site.

As outlined in WAC 173-201A-612, Possession Sound uses include salmon and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; and crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning. Other uses include shellfish harvest, primary contact recreation, wildlife habitat, commerce and navigation, boating, and aesthetic values.

3.2.2 Stormwater Outfall and Catch Basins

As described in Section 2.3, most of the stormwater from the operation areas of the Site is currently collected in a series of catch basins. Previously, a collection sump in the central portion of the property discharged to the sanitary sewer system. Stormwater runoff from a small area on the north side of the marine railway that discharged into the North Marina until July 2008 is also collected in a catch basin and reportedly discharges to the sanitary sewer. The stormwater treatment system in the Weld Shop building that transferred contents of the collection sump to the sanitary sewer system was removed when ESY vacated the property in fall 2009.

Table 3-1 summarizes findings from the catch basin assessment, including volume of accumulated sediment and connectivity of site catch basins. Dye testing was performed on 18 of the 22 catch basins to confirm connectivity to Outfalls A, B, C, 001 or 002 discharging to the North Marina; or to one of the City of Everett sewer system manholes located on the property (Figure 3-1). The remaining catch basins' connectivity could not be evaluated because they were deliberately plugged with fabricated plugs, clogged with accumulated sediment blocking outlet pipes, or contained electrical wiring which presented a potential safety hazard and indicated that the basins were most likely closed-end sumps. No catch basins investigated during the dye-test period were observed to discharge to Outfall C, located in the southwestern portion of the Site. Catch basins Outfall 002-CB1, Outfall UNK-1 were noted to be clogged and Outfall UNK-7 and Outfall UNK-8 had electrical wiring, thus, these locations were not assessed.

Several ponded areas were observed at the Site following heavy rainfalls or extended periods of rain. Several topographic depressions located near catch basins Outfall A-CB, Outfall B-CB3, and Outfall SS-1have been observed to collect water. Localized ponding was evident in the central portion of the Site west of Building 9 among skids and immediately south of the marine railway. These areas correspond with topographic lows shown on a site survey provided by the Port (Figure 1-3).

3.3 SOILS

3.3.1 Surface Soils/Fill Material

Surface cover across the Site generally consists of asphalt, concrete, or bare ground consisting of soil and gravel admixtures (Figure 1-3). Concrete is visible along the sidewalk in the West Marine View Drive right-of-way, along the marine railway, as well as smaller isolated areas including pads under awnings or covered open-air work spaces. Bare ground is visible in the northeast corner of the Site, between West Marine View Drive and the weld shop building, and in much of the west-central and southwest portions of the Site.

Surface soils across the Site are typically brown to dark brown sand and gravel, with some fines and wood fragments. These soils are presumed to be imported fill material, introduced to the Site for grading purposes during construction and development. Varying amounts of abrasive grit accumulations were also noted on the ground surface across the Site, as shown on Figure 3-2. The abrasive grit was most frequently observed in the central portion of the Site, among the skids where abrasive blasting activities commonly occurred. The abrasive grit was typically black medium to coarse sand size material and was discontinuous across the Site. During ESY operations, a coarse gravel layer approximately 2-inches thick was placed around the northern and central skid areas. This gravel layer served as a surface marker for grit removal when a loader was used to remove accumulated abrasive grit. Much of the grit has been mixed in with other surficial fill materials, thus grit and soil admixtures were evident as deep as 1 foot bgs. Abrasive grit was observed in several soil boring locations beneath concrete (e.g., beneath Buildings 7 & 9, weld shop, and boat shed) or asphalt, presumably an artifact from past site industrial activities.

3.3.2 Shallow Soils/Fill Materials

Soil borings completed through asphalt and concrete identified shallow fill materials directly beneath the surface covering. Base course beneath asphalt and concrete areas typically ranged from 0.25 to1 foot thick. The base course material generally consisted of brown to dark brown fine gravel or gravelly sand with trace amounts of silt. Fill beneath building foundations is differentiated from base course material by the distinct lack of both well-graded gravels and fines as well as the yellow-brown to tan color. The foundation fill varied in thickness from approximately 0.5 to 3 feet in thickness.

Hydraulic fill material was noted underlying the surface and shallow fill material in the majority of the borings completed across the Site. According to Landau (2001) this fill is marine alluvium hydraulically placed about 60 years ago. Prior to the placement of this fill, the shoreline was located in the vicinity of West Marine View Drive (Figure 2-1). Shell fragments and wood debris, including sawdust, were noted at many of the soil borings. Above the groundwater table, hydraulic fill typically consisted of brown medium grained sand with frequent rust colored mottling. The lack of or trace amounts of gravel encountered in hydraulic fill distinguish these soils from base course, which typically contained at least 15 percent gravel. At the groundwater interface and within the saturated zone, the hydraulic fill consisted of gray to dark-gray medium sands with lenses of finer-grained material and laminations with increasing depth. None of the soil borings completed during the RI/FS or prior site investigations appear to have been drilled through the entire thickness of the hydraulic fill material. Below the hydraulic fill, presumably at or below an elevation of 0 feet above MLLW, marine alluvial deposits are present and these sediments are underlain by glacial till, transitional beds, and/or advance outwash deposits (USGS, 1985).

North-to-south and east-to-west cross sections depicting the distribution of surficial and subsurface fill material are shown on Figures 3-3 and 3-4. With the exception of surficial and foundation fill material, significant variation (nature and thickness) in the hydraulic fill material was not apparent. The surficial fill material varied in composition (e.g., presence of abrasive grit and wood fragments) and thickness across the Site. The greatest extent of base course/foundation fill was noted beneath the weld shop building (Figure 3-3).

3.3.3 Geophysical Survey/Subsurface Features

The magnetometer survey identified two strong magnetic anomalies directly south of the Harbor Marine building which are suspected UST locations/ferrous metal objects. The westernmost suspected UST is located approximately 35 feet east of the bulkhead and the easternmost tank approximately 50 feet to the east. The GPR survey conducted over the suspected UST locations indicated that the top of these features appear to be at a depth of approximately 2 feet bgs. The results of the magnetometer and GPR survey (Global Geophysics, 2010) are provided in Appendix D. The magnetic survey also noted an area with higher magnetic field intensity that could be associated with an historic concrete foundation with metal mesh. This area was noted to be slightly higher than the surrounding asphalt surface, indicating that the area around this feature may have undergone some subsidence.

3.4 GROUNDWATER

The Site monitoring well network includes monitoring wells MW-1 and MW-2 installed in 2003 and monitoring wells MW-4 through MW-10 installed during the RI in 2008. Groundwater was encountered during the drilling of the borings/monitoring wells at depths ranging from 2 feet and 8 feet bgs. The saturated zone generally exists within the hydraulic fill material (Figures 3-3 and 3-4). Synoptic ground water level and elevation data collected during January, April, July, and October 2009 sampling events are summarized in Table 2-3. Corresponding groundwater elevation contour maps for the January, April, and October 2009 are depicted on Figures 3-5a through 3-5c.

The highest groundwater levels were evident during the winter measurements in January 2009. The groundwater levels in the majority of monitoring wells steadily declined from the winter 2009 through the fall (October 2009) monitoring events. This decline is consistent with seasonal fluctuations associated with decreasing precipitation and recharge. Based on groundwater elevation data, groundwater flow is inferred to be predominantly westerly toward the marina. The groundwater gradient from east to west across the Site ranged from 0.004 to 0.006 feet/feet. Based on the groundwater levels collected in January 2009 (Figure 3-5a), groundwater mounding was evident in the vicinity of MW-7 and MW-2. Both of these wells are located within unpaved portions of the Site and the higher groundwater levels noted in these wells appear to be the result of infiltration of surface water which was observed to be ponded in these areas. Groundwater mounding was not evident in this area during subsequent groundwater monitoring events conducted during the drier months (spring, summer, and fall) of 2009.

Tidal fluctuations in groundwater levels were apparent during monitoring of water levels at and around low tides (Table 2-3). The degree of water level fluctuation varied across the Site and was the greatest during the January 6, 2009 monitoring event. Monitoring wells MW-4, MW-5, and MW-8 displayed an approximately 2-foot difference in groundwater levels between measurements made around low tide on that date. Only minor fluctuations in groundwater levels were evident during the other seasonal groundwater monitoring events.

3.5 SEDIMENT

The marine environment west of the shipyard is tidally influenced but protected by an offshore breakwater (Figure 1-1). This area has been in use as a marina since at least the 1960s. The Snohomish River flows just west of the marina entrance. River-borne sediments are transported into the marina area, particularly during flood tides, making the area depositional in nature. The Port arranges for periodic maintenance dredging to maintain needed navigation depths. According to the Port, the most recent dredging in the portion of the North Marina adjacent to the shipyard took place in 1990 and 2001.

The 1990 marina dredging reportedly had target depths ranging from -10 feet MLLW to -13 feet MLLW. This dredging targeted sediments throughout the portion of the North Marina adjacent to ESY. However, a map of the post-dredge soundings depicts the dredging limits as excluding a near-shore buffer approximately 40 feet in width along the north-south bulkhead as well as the bulkhead running west from the Travel Lift. The area encompassing the marine railway and the adjacent floating dock was also excluded from the dredging.

A record drawing (Port, 2001) from the Port's 2001 maintenance dredging shows that this action was somewhat more limited in scope than the 1990 dredging (Appendix G). The target dredge depth was -12 feet MLLW, and the record drawing shows depths in the dredged area ranging from approximately -10 to -16 feet MLLW. Similar to the earlier dredging, a 30- to 40-foot buffer was left undisturbed along both the north-south and east-west bulkheads. Sediments at the marina railway and adjacent floating dock were not subject to dredging. The record drawing also suggests that none of the sediments south of the marine railway were subject to dredging in 2001.

Typical sediments in the marina area just west of the shipyard as measured during the RI are composed of approximately 50 percent silt and 25 percent sand, with smaller amounts of organics, clay particles and gravel. Sediments immediately adjacent to the bulkhead and not subject to routine dredging tend to have a higher fraction of coarse material, possibly originating from the fill materials used to create the upland area.

4.0 NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of contamination detected in soil, groundwater, and sediment at the Site. The data presented in this section and the discussion includes the results of previous investigations conducted by Landau and URS and the work completed during the RI. The soil, groundwater, and sediment data were validated in accordance with the QAPP (URS, 2008) and the data validation memorandum for samples collected during Phase I and II were included within the *Preliminary RI Data Report* (URS, 2009) and the *Preliminary RI Phase II Data Submittal* (URS, 2010a), respectively. Data validation memorandum for the samples collected during Phase III are included in Appendix A. No data usability issues were identified during the data validation review, with the exception of selected VOCs data for groundwater sample collected during Phase III. Soil and groundwater analytical data summary tables are included in Appendix H.

Analytical data collected as part of the RI and summarized in the sections below were compared to both preliminary screening levels (PSLs) and preliminary cleanup levels (PCLs) for upland media. The PSLs, initially developed as part of the RI/FS work plan, consider all applicable pathways, including direct contact (i.e., ingestion, dermal contact, and inhalation), cross-media transfer pathways (i.e., leaching to groundwater, groundwater migration to surface water/adjacent marine sediments, and vapor intrusion pathway), and exposure to terrestrial and/or aquatic ecological and human receptors. PCLs are established as part of the RI. PCLs may be different than the PSLs because a better understanding of the conceptual site model (e.g., contaminants in soil may not be impacting site groundwater) for the Site is gained during the RI data gathering process.

4.1 SOILS

Soil investigations conducted at the Site have included Landau's 2003 Phase II site assessment (Landau, 2003), URS' limited soil assessment in 2007 (URS, 2007) and the current RI implemented under the Agreed Order. The RI field activities were conducted in two phases, the first beginning in November 2008. Soil samples were analyzed during these investigations as discussed in Sections 2.0 and 3.0 and included analysis for petroleum hydrocarbons, metals, organotin compounds, PCBs, VOCs, and SVOCs. Samples identified with elevated concentrations of arsenic and lead were also analyzed for metals using the toxicity characteristic leaching procedure (TCLP) to test metal mobility from the site soil samples, which is a requirement for determining proper disposal of contaminated soil.

4.1.1 Indicator Hazardous Substances for Soil Media

Findings from the first phase of the investigation were originally reported in the *Preliminary Remedial Investigation Data Report* (URS, 2009a). In this report, soil analytical results were compared to PSLs (see Appendix C) and PCLs (URS, 2009a), and constituents exceeding the PSLs were identified as indicator hazardous substances as required in the Agreed Order. The preliminary indicator hazardous substances for soil included:

- Diesel-range and oil-range petroleum hydrocarbons;
- cPAHs: benzo(a) anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene;
- PCBs: Aroclor 1254 and total PCBs;
- Metals: antimony, arsenic, copper, lead, nickel, and zinc; and
- SVOCs: Bis-2ethylehxyl phthalate (BEHP).

Based on these findings, additional areas within the Site were identified as requiring further characterization to define the lateral and vertical extent of the preliminary indicator hazardous substances. The second phase of field investigation was conducted beginning in October 2009 and analyses focused on preliminary indicator hazardous substances as described in the *Supplemental Remedial Investigation Work Plan* (URS, 2009b).

In late May and early June 2010, a supplemental sediment investigation to assess the quality of intertidal sediments located between two bulkheads near the Port's Travel Lift in the northeast corner of the North Marina was implemented. Field observations during the sediment sampling indicated the presence of petroleum hydrocarbons in sediment. To assess whether upland soils and groundwater east of the bulkhead were impacted, a Phase III soil investigation was conducted on June 24 and 25, 2010, in accordance with the draft Phase III Upland Work Plan (URS 2010).

The following section presents the findings of the soil investigations and describes the nature and extent of soil impact at the Site. The discussion focuses on the preliminary indicator hazardous substances identified above and also includes a discussion of organotin, VOCs, and pentachlorophenol results. The soil analytical data for these constituents are summarized in Table 4-1. The TCLP results for metals are summarized in Table 4-2. Sampling locations are depicted on Figure 2-1. As indicated previously, the data have been compared to PCLs (MTCA Method A or Method B direct contact; see Section 6.2.1) which are also presented in Table 4-1. In some cases, the PCLs are less stringent than the PSLs. Of the chemicals identified as preliminary indicator hazardous substances in soil, nickel, zinc, and BEHP do not exceed their respective PCLs. Therefore, these constituents are no longer considered to be indicator hazardous substances.

The sampling locations exceeding PCLs for arsenic and lead, petroleum hydrocarbons, cPAHs, and PCBs are shown on Figures 4-1 through 4-4, respectively. A compilation of all indicator hazardous substances (including antimony and copper) exceeding soil PCLs is presented on Figures 4-5a and 4-5b.

4.1.2 Metals and Organotins

Metals and Organotins in Soil

Nickel and zinc concentrations did not exceed MTCA Method B direct contact soil cleanup levels in any of the samples collected at the Site. Arsenic, lead, antimony and copper were detected in the Site soils at concentrations above their respective PCLs. Of these metals, arsenic and lead were the most frequently detected across the Site. Arsenic was detected above the Method A cleanup level (20 mg/kg) in 52 soil samples at 46 boring locations. Arsenic concentrations ranged from 2.4 mg/kg (BSS-1) to 2,220 mg/kg (SS-31). Lead was detected above the Method A cleanup level (250 mg/kg) in 29 soil samples at 27 boring locations. Elevated lead concentrations were frequently co-located with arsenic concentrations exceeding preliminary cleanup levels. This relationship is illustrated on Figure 4-1, which shows the locations where arsenic and lead concentrations in soil exceeded the cleanup levels. Arsenic and lead concentrations exceeding soil PCLs were generally noted within unpaved areas in and around existing skids and in the northeast corner of the Site. Arsenic was detected above the PCL mostly in shallow samples, less than 1.5 feet bgs. Arsenic concentrations exceeding the Method A cleanup level (which is the PCL) were only noted in two deeper soil samples from boring locations, SS-25 (3.5 feet bgs) and SB-43 (3 feet bgs). Both of these boring are located in the west-central portion of the Site (Figure 4-1). Elevated lead concentrations were only noted in shallow soil samples across the Site.

Concentrations of antimony and copper at levels above their respective PCLs (based on Method B direct contact) were also detected in a number of borings which had elevated levels of arsenic and lead concentrations. Copper was detected in 6 borings (SB-26, SS-35, SS-30, SS-31, SS-14 and SS-12) and antimony in 12 borings (MW9, SB-5, SB-12, SB-26, SB-30, SB-75, SS-31, SS-32, SS-36, SS-37, SS-38 and SS-41) at concentrations above the PCLs. Concentrations of copper and antimony exceeding PCLs were only detected in shallow soil samples. Copper concentrations ranged from 6.7 mg/kg (SB-73) to 4,560 mg/kg (SB-26), and antimony concentrations from 6 mg/kg (SB-79) to 320 mg/kg (SB-26).

Organotins were detected at 15 of the 20 samples analyzed in soil borings completed during the initial RI sampling completed in 2008. Concentrations of tributyltin (TBT) as TBT ion ranged from 6.3 to 7,200 µg/kg. TBT was not detected in soil at concentrations above its PCL of 7,400 µg/kg (based on protection of marine surface-water). Therefore, TBT was not considered to be a preliminary indicator hazardous substance in soil.

Metals in TCLP Leachate

The results of TCLP metals analyses are summarized in Table 4-2. TCLP metals analyses on the six samples collected in 2003 and 2007 did not detect levels exceeding the dangerous waste characteristic criteria concentrations outlined in Dangerous Waste Regulations (WAC 173-303-090) with the exception of lead (5.0 mg/L) in one sample (SS5-0-1). Sample SS5-0-1 had a TCLP lead concentration of 8.9 mg/L and this sample was a composite surface soil collected from the southwest portion of the Site, near locations SS-5, SS-10, and SS-11. Paint chips and abrasive grit were noted on the ground surface in this area, and may account for the TCLP failure for lead.

Five additional samples, with elevated concentrations of arsenic and lead, collected during the RI, were also analyzed for TCLP metals. None of the TCLP analyses detected arsenic, lead, or the other metals at concentrations in TCLP leachate exceeding the dangerous waste characteristic criteria concentrations.

4.1.3 Petroleum Hydrocarbons

During Phases I and II of the RI, diesel- and/or oil-range petroleum hydrocarbons were detected in soil samples from borings SS-2, SS-5, SS-22, SB-6, SB-7, SB-24, SB-26, SB-73, and SB-74 (Figure 4-2) at concentrations exceeding the PCL of 2,000 mg/kg (based on the MTCA Method A soil cleanup level for unrestricted use). These exceedances were detected in samples collected at depths up to 3.5 ft bgs and in all but one case, the hydrocarbon concentrations reported in the underlying sample was below the cleanup level (Table 4-1). Diesel- and oil-range petroleum hydrocarbon concentrations exceeding the PCL were detected in three primary areas: near the southwestern corner of the Site, beneath Building 7 and near the west-central portion of the Site (Figure 4-2). The highest concentrations of oil-range petroleum hydrocarbons (27,000 mg/kg) were identified beneath Building 7. Oil-range petroleum hydrocarbons exceeding the PCL beneath Building 7 ranged in concentrations from 4,500 mg/kg (SB-73) to 27,000 mg/kg (SB-7). During drilling within Building 7, a concrete sub-slab was evident below the floor slab, and soil between the two slabs appeared to be stained with cutting oils or other petroleum substances. Also, during field screening of soils below the sub-slab, petroleum odors and staining were noted in some of the soil borings (Figure 3-2). Petroleum hydrocarbons were also detected throughout the Site at concentrations below the PCL (Table 4-1).

During Phase III, diesel-range petroleum hydrocarbons exceeded the PCL of 2,000 mg/kg in samples collected from 6 of the 15 borings located east of the Port of Everett Travel Lift Boat Haul-out, including: SB-95, SB-96, SB-97, SB-100, SB-101, and SB-102 (Figure 4-2). The highest concentration of diesel-range petroleum hydrocarbons (8,400 mg/kg) was detected in boring SB-102 at a depth of 4 to 5 ft bgs. Diesel and oil-range petroleum hydrocarbons were detected at concentrations below the Method A soil cleanup level at borings SB-93, SB-94, SB-98, SB-103, and SB-104 (Table 4-1).

No hydrocarbon odor or sheen was evident in the samples collected from borings SB-93A, SB-106 and SB-107 (Figure 4-2). Soil samples collected from the remaining 12 borings completed in this area exhibited hydrocarbon odors and/or a sheen. The intervals exhibiting odors extended from depths of 2 to 16 feet bgs, with the shallowest (less than 4 feet bgs) evidence of impacts observed in borings SB-100, SB-101 and SB-102. A hydrocarbon sheen was evident on one or more of the soil samples collected from most of the borings where a petroleum hydrocarbon odor was observed. Measurable free product was not evident in any of the borings and none of the samples exhibited elevated PID readings.

4.1.4 cPAHs

Carcinogenic PAHs (cPAHs) were reported in soil samples from 48 soil borings at concentrations exceeding the PCL (Figure 4-3). The PCL for cPAH is based on the calculated total toxicity of the cPAH mixture, using the toxicity equivalency factors established in WAC 173-340-780. The cleanup level for cPAHs is based on the total toxic equivalent concentration (TTEC) concentration (140 µg/kg). All seven of the cPAHs were often detected in samples having TTEC concentrations exceeding preliminary cleanup levels.

Carcinogenic PAH concentrations exceeding the PCL were noted across the Site, including both the unpaved and paved areas, beneath the Everett Engineering buildings

(Nos. 7 and 9), and the machine shop. Soil samples collected from a limited number of borings located within other buildings (e.g., weld shop, office, wood shop and boat shed) also detected levels of cPAHs exceeding the PCL. Typically in samples exceeding PCLs, either chrysene or benzo(a)pyrene was detected at the highest concentration. The highest cPAH TTEC value (4,692 µg/kg) was reported at boring SB-42, in the vicinity of the former net dipping operation located south of the former Fish Processing building. The highest cPAH TTEC value within the Lease Area was detected at SB-24 (3,890 µg/kg). At the majority of the boring locations, cPAHs exceeding the PCL were detected in shallow soils at depths of less than 1 foot bgs (Table 4-1, Figure 4-3). The deepest occurrences of cPAHs generally extended to between 2 feet to 3 feet bgs.

4.1.5 PCBs

PCBs were detected in soil samples at 14 borings locations at concentrations exceeding the PCL of 1,000 µg/kg (based on the MTCA Method A cleanup level for total PCBs) (Figure 4-4). PCB concentrations ranged from 34 µg/kg (SB-61) to 74,900 µg/kg (SB-80). PCB occurrence at the Site was generally localized beneath and adjacent to Building 9. PCB concentrations exceeding the PCL were noted in the shallow fill to a depth of less than 2 feet bgs or below the base of structural fill materials beneath the Building 9 concrete slab. Three PCB isomers, Aroclor 1248, 1254, and 1260 were detected in the soils beneath and around Building 9. In most cases, elevated PCB concentrations in this area were co-existed with elevated levels of metals and cPAHs (Figure 4-5a).

PCB detections were also identified in three borings (SB-24, SB-25, and SB-26) along the western portion of the Site and in one boring (SB-55) beneath the boat shed (Figure 4-4). The apparently isolated PCB detections typically consisted of Aroclor 1254 and/or 1260.

PCB concentrations in two borings, SB-77 and SB-80, located on the south side of Building 9 exceeded the TSCA regulatory criteria of 50,000 µg/kg for total PCBs (see Section 7.3.3). The vertical extent of the PCBs at these locations was less than 3 feet.

4.1.6 VOCs

During Phases I and II, tetrachloroethene (PCE) and methylene chloride were the only VOCs detected in the Site soils at concentrations exceeding PSLs. PCE was detected in a sample from boring SB-28 collected beneath the boat shed at a depth of 4 to 5 feet (13 µg/kg). The PCE concentration in this sample was below the PCL of 1,900 µg/kg. Methylene chloride was detected in five samples at concentrations ranging from 3.1 µg/kg (SB-19) to 6.4 µg/kg (SB-17), which is below the PCL of 130,000 µg/kg.

Based on the presence of odors and sheen noted during Phase III investigations, selected soil samples from borings SB-93, SB-94 and SB-95 were analyzed for VOCs. Ten VOCs were detected in the soil samples at concentrations below PCLs (Table 4-1). The highest concentrations of VOCs were detected in boring SB-94 at 15 feet bgs. Naphthalene was not detected in the soil samples.

VOCs detected are not considered to be indicator hazardous substances in soil at the Site because they were not detected above the PCLs.

4.1.7 SVOCs

Two SVOCs were detected in the Site soils: pentachlorophenol (PCP) and BEHP. PCP was detected in the shallow surficial soils at borings SB-30 (440 µg/kg) and SS-41 (290 µg/kg) at concentrations below the PCL of 8,300 µg/kg. These two borings are located in close proximity to each other west of the Everett Engineering machine shop. BEHP was detected across the Site at concentrations ranging from 220 µg/kg (SS-37) to 5,900 µg/kg (SB-7). The detections were noted in the shallow soil to a maximum depth of 2 feet. The BEHP and PCP concentrations detected in soil did not exceed their respective PCLs (based on MTCA Method B direct contact cleanup levels) and therefore, these constituents are not considered to be an indicator hazardous substance for soil at the Site.

4.1.8 Extent and Magnitude of Soil Contamination

The investigations conducted at the Site have identified four metals (arsenic, lead, copper, and antimony), cPAHs, PCBs, and oil- and diesel-range petroleum hydrocarbons in the soils at concentrations exceeding their respective PCLs. The distribution of these indicator hazardous substances in soil is depicted on Figures 4-5a and 4-5b. Site soil contamination was found to be covering the majority of the Lease Area and extends beyond the south and southeastern portion of the Lease Area boundary. However, soils in the northwestern corner of the Lease Area and beneath selected buildings as shown in Figure 4-5a were not found to be impacted during the RI. The majority of the contamination was noted in the surficial fill material and/or the uppermost portion the underlying hydraulic fill material. The vertical extent of soil impacts were generally limited to less than 3 feet bgs.

Metals and cPAHs are the most common constituents detected in the shallow soils at concentrations exceeding PCLs. The highest concentrations of metals are present within the unpaved areas within the Lease Area boundary. Contamination noted outside of the Lease Area boundary to the south, but was limited to elevated levels of cPAHs, including the highest concentrations of cPAHs, which were detected south of the former Fish Processing building. Isolated areas of primarily cPAH contamination were also located outside of the Lease Area boundary along the west side of the Site and near the northeastern corner of the Site beneath the recently constructed sidewalk. Arsenic also exceeded its PCL in two borings near the northeast corner of the Site. cPAHs also exceeded PCL in the vicinity of the marine railway alignment (SB-36 and SB-26). Additional soil sampling in this area will be conducted as needed during remedial design and/or the remedial action.

PCBs exceeding the PCL of 1,000 µg/kg (the Method A cleanup level) are primarily located in the shallow soil beneath and adjacent to Building 9. PCB detections in other areas of the Site were sporadic in nature. The highest concentrations of PCBs detected at the south end of Building 9 exceeded the TSCA regulatory criteria of 50,000 µg/kg and would require special handling if removed (see Section 7.3.2). The soils exceeding the TSCA regulatory criteria extend over an area of approximately 50 feet by 20 feet by 2 feet in thickness. With the exception of two instances (SB-24 and SB-26), PCBs did not co-exist with elevated levels of petroleum hydrocarbons.

Elevated concentrations of petroleum hydrocarbons were detected beneath Building 7 in the area of the sub-slab associated with Everett Engineering machining equipment. The petroleum hydrocarbons detected in other areas of the Site during the initial phases of investigation were generally sporadic, with only two small areas along the western portion of the Site where the Method A cleanup level was exceeded.

The soil investigation performed east of the Port of Everett Travel Lift Boat Haul-Out bulkhead identified diesel-range petroleum hydrocarbon affected soils at concentrations exceeding the PCL of 2,000 mg/kg in samples collected from 6 of the 15 borings completed in this area (Figure 4-2). Concentrations of oil-range petroleum hydrocarbons and VOCs did not exceed PCLs in any of the borings. The highest concentration of diesel-range petroleum hydrocarbons was detected in boring SB-102 at a depth of 4 to 5 feet bgs, which is within the unsaturated zone. The distribution of hydrocarbons (e.g., shallow depth and concentration) suggests that this boring is located near a source of petroleum hydrocarbons. Based on the geophysical survey results (see Section 3.3.3), two metallic features (Figure 4-5b) were identified east of the borings SB-100 and SB-101. These features are suspected to be potential UST locations, and may be the potential source of the petroleum hydrocarbon contamination. The extent of petroleum hydrocarbons in soil is bounded to the west by the bulkhead. Petroleum hydrocarbon concentrations exceeding the PCL were present in close proximity to the bulkhead at depths between 7 and 14 feet in borings SB-95, SB-96 and SB-97. These samples were collected within the saturated zone and near the top of the groundwater table. The northern extent of impacted soil appears to be bounded by analytical results for samples collected from boring SB-98, and the southern extent is bounded by results from borings SB-93 and SB-103. The eastern extent of impacted soil is partially bounded by results from borings SB-104 through SB-107. However, the extent of impacted soil east of boring SB-97, adjacent to the Harbor Marine building is uncertain.

4.2 GROUNDWATER

Groundwater investigations were conducted at the Site by Landau in 2003 and by URS during the RI (URS, 2009 and 2010). Groundwater samples were collected from the Site monitoring well network (MW-1 through MW-10) and from 13 soil borings (LB4 through LB8; and SB-01, SB-07 through SB-11, SB-19 and SB-43). Groundwater sampling locations are shown on Figure 2-1 and analytical results are summarized in Table 4-3.

Six compounds were detected in groundwater at concentrations exceeding the PSLs (see Appendix C) and were identified as the preliminary indicator hazardous substances for groundwater: arsenic, copper, nickel, zinc, BEHP, and diesel-range petroleum hydrocarbons. Because of the proximity of the Site to marine surface water (the North Marina), groundwater cleanup levels are based on protection of surface water beneficial uses. PCLs for the compounds detected in the groundwater samples are listed in Table 4-3 and described in Section 6.2.1. The PCL for copper is less stringent than the PSL and therefore, copper is no longer considered to be an indicator hazardous substance in groundwater. Analytical results for hazardous substances in groundwater are shown on Figure 4-6.

The PCL for arsenic is based on the background concentrations for the State of Washington (WAC 173-340-900, MTCA Method A Cleanup Levels for Groundwater), because the most stringent applicable or relevant and appropriate requirement (the

National Toxics Rule for human health) is more stringent than the natural background concentration for arsenic. Compliance with this PCL is based on the total fraction unless a properly constructed monitoring well does not provide low turbidity water samples. For copper, nickel and zinc, the PCL is based on the marine water chronic surface water quality standards (SWQS) under Chapter 173-201A WAC and compliance with these standards is based on the dissolved fraction as described in the rule. For nickel, the SWQS value of 0.0082 milligrams per liter (mg/L) exceeds the Practical Quantitation Limit (PQL) for nickel (0.010 mg/L) and the PCL in Table 4-3 reflects the PQL. For BEHP, the PCL is based on the National Recommended Water Quality Criteria (NRWQC) and compliance with this standard is based on the total concentration.

The analytical results for these constituents are discussed below relative to the PCLs. Results for other constituents detected are compared to the preliminary screening levels presented in the *Final RI/FS Work Plan* (URS, 2008a).

4.2.1 Metals

Arsenic

Arsenic was only reported above the MTCA Method A cleanup level (0.005 mg/L) in two wells (MW-4 and MW-6). Arsenic concentrations in well MW-4 were consistently detected in both total and dissolved (filtered) samples exceeding the MTCA Method A cleanup level. Dissolved arsenic concentrations in this well were the highest in January 2009 (0.025 mg/L) and ranged from 0.006 mg/L to 0.010 mg/L during the other sampling events. The only other arsenic concentration reported above the MTCA Method A cleanup level was detected in MW-6 (0.007 mg/L) during the April 2009 sampling event. Arsenic was detected in MW-6 at concentrations ranging from less than the detection limit to 0.0001 mg/L during the other three sampling events.

The majority of the groundwater samples collected from the borings did not detect arsenic. Where detected, the highest concentrations were noted in SB-8 and SB-43 (0.002 mg/L) and were below the MTCA Method A cleanup level.

Copper

Total copper concentrations exceeding the SQWS (0.003 mg/L) were reported in one or more of the sampling events at monitoring wells MW-2, MW-4, MW-6 and MW-7. Total copper concentrations exceeded the cleanup level (0.0031 mg/L) in 4 of the 25 samples collected from the monitoring wells. Total copper concentrations in the monitoring well samples ranged from 0.004 mg/L (MW-2 & MW-7) to 0.020 mg/L (MW-6). The two samples with the highest copper concentrations had relatively high field turbidity measurements (67.7 to 209 NTUs) and the copper concentrations show a strong correlation with turbidity (R^2 - Coefficient of Determination = 0.97) (URS, 2010a). The corresponding dissolved copper concentrations in wells MW-4 and MW-6 were significantly lower. Therefore, it appears that the total copper concentrations are not representative of the groundwater quality and were the result of suspended solids in the groundwater samples.

Compliance with the SWQS is based on dissolved concentrations and dissolved copper was not detected at concentrations exceeding the PCL in any of the monitoring well or boring groundwater samples. Therefore, copper is not considered to be an indicator hazardous substance in groundwater.

Nickel

Total nickel was only detected in 3 of the 26 samples collected from the borings and monitoring wells. Total nickel was detected in samples from wells MW-6 and MW-7 at concentrations ranging from 0.02 mg/L to 0.03 mg/L. Similar to copper, total nickel was generally detected in samples with elevated turbidity; therefore, the dissolved concentrations are considered to be more representative of the groundwater quality.

Compliance with the SWQS is based on dissolved concentrations and dissolved nickel concentrations exceeding the PCL were only detected in MW-7 (0.03 mg/L) during the April 2009 sampling event. It is noted that both total and dissolved concentrations of nickel were not detected above laboratory reporting limits in the next two rounds of groundwater sampling at MW-07.

Zinc

Total zinc was detected above the reporting limit in two samples collected from the monitoring wells (MW-6 and MW-7). However, total zinc was only detected in MW-7 (January 2009) at concentrations exceeding the PCL. Similar to copper and nickel, the elevated zinc concentration was detected in the sample with elevated turbidity.

As discussed above, compliance with the SWQS is based on dissolved concentrations and dissolved zinc concentrations exceeded the PCL in only one sample, MW-7 (0.42 mg/L). It is noted that both total and dissolved concentrations of zinc were either not detected above laboratory reporting limits, or were below the PCL in the next three rounds of groundwater sampling at MW-07. Also, only one of the groundwater samples collected from the borings contained dissolved zinc level above the reporting limit (SB-43, 0.03 mg/L).

Organotins

With the exception of monitoring wells MW-1 and MW-2, none of the groundwater samples collected detected organotins above the reporting limits. Butyl tin was only detected in monitoring well samples from MW-1 (0.008 mg/L) and MW-2 (0.024 mg/L) and a groundwater cleanup level has not been established for this tin ion.

4.2.2 SVOCs

Six SVOCs were detected in the groundwater and only BEHP was detected above the PCL of 2.2 µg/L. BEHP was reported in the January 2009 samples at MW-02 and MW-07, and in the April 2009 sample from MW-07 at concentrations ranging from 2.3 µg/L to 260 µg/L. BEHP has not been detected above the PQL in subsequent groundwater samples from the monitoring wells or at SB-43.

4.2.3 VOCs

During Phases I and II, low concentrations of chlorinated VOCs were detected in the groundwater including: PCE, 1,2-dichloroethane (EDC), 1,1,2,2-tetrachloroethene and chloromethane. PCE was detected the most frequently, including groundwater samples collected at SB-07 (0.074 µg/L) and MW-7 (0.09 to 0.2 µg/L), located beneath and downgradient of the Everett Engineering Buildings 7 and 9, respectively. None of the chlorinated VOCs exceeded PSLs (URS, 2008a).

Other VOCs detected in the groundwater during Phases I and II included low concentrations of acetone, chloromethane, and methyl tert-butyl ether (MTBE). MTBE was detected the most frequently, including multiple detections at sampling locations MW-1 (2.3 to 4.6 μg/L), MW-2 (1.0 to 1.1 μg/L) and MW-6 (0.8 to 0.9 μg/L). These VOCs do not have established screening levels for the protection of marine surface water.

During Phase III investigations, VOCs (e.g., toluene; xylenes; 1,2, 4-trimethylbenzene, isopropylbenzene; n-propylbenzene, and tert-, sec- and n-butylbenzenes) were detected in the groundwater samples collected from the borings SB-93, SB-94 and SB-95 (Table 4-3). None of the VOC detections exceeded PCLs.

4.2.4 Petroleum Hydrocarbons

During the initial two phases of investigation, including the first two quarterly monitoring events, diesel- and oil-range petroleum hydrocarbons were not detected above the PCLs.

During Phase III, diesel-range petroleum hydrocarbons were detected in all of the groundwater samples collected from the borings completed east of the Port of Everett Travel Lift Boat Haul-Out (Table 4-3). Diesel-range petroleum hydrocarbons concentrations ranged from 0.17 mg/L (SB-95) to 6.0 mg/L (SB-94). Only one of the groundwater samples (SB-94) exceeded the PCL of 0.5 mg/L. Oil-range petroleum hydrocarbons were not detected in any of the samples at concentrations above the PCLs.

4.2.5 Spatial Distribution of Groundwater Contamination

Groundwater contamination by the indicator hazardous substances (i.e., arsenic, nickel, zinc, diesel-range petroleum, and BEHP) appears to be sporadic and limited in lateral extent. Groundwater monitoring indicated that low level exceedances of PCLs were identified in monitoring wells MW-2, MW-4, MW-6, and MW-7. Groundwater samples collected from borings did not detect any of the indicator hazardous substances above PCLs.

Dissolved arsenic was detected in groundwater (Figure 4-6) at MW-4 (0.006 to 0.02 mg/L) during all four sampling events at concentrations exceeding its PCL based on the MTCA Method A cleanup level of (0.005 mg/L). Dissolved arsenic exceeding the PCL was also detected during one sampling round at MW-6. Both MW-4 and MW-6 are situated adjacent to the western Site boundary. Groundwater sampling locations upgradient (e.g., east) from MW-6 did not detect dissolved arsenic. Other monitoring wells and groundwater sampling locations along the western part of the Site (e.g., SB-43, MW-1 and MW-5) did not detect dissolved arsenic. Nickel and zinc were detected at MW-7 at levels exceeding the PCL. Sample locations upgradient (SB-7 and SB-8) and downgradient (MW-5) from MW-7 did not detect nickel or zinc. Based on these data, it appears that arsenic occurrence in the groundwater, as well as nickel and zinc, are localized. Dissolved copper concentrations did not exceed the PCL.

Only one SVOC, BEHP, was detected at concentrations exceeding the PCL. In January 2009, BEHP was reported at a concentration of 80 μg/L in well MW-2; however, BEHP was not detected above the reporting limit at well MW-2 during the four other sampling events at this location. BEHP was also detected at a concentration of 260 μg/L in the sample from well MW-7 in January 2009, but it was not detected above the reporting limit in the field duplicate sample collected from this well during the same sampling event. BEHP is a common field and laboratory contaminant and the elevated concentrations detected in wells MW-2 and MW-7 in January 2009 appear to be the result of field or laboratory contamination based on the results of the field duplicate and the concentrations reported in subsequent sampling events.

MTBE and PCE were the only VOCs detected in the groundwater at more than one sampling location. MTBE detections were situated in the northwestern portion of the Site, downgradient of the weld and wood shop buildings at monitoring wells MW-1, MW-2 and MW-6. PCE detections were localized beneath and directly downgradient of the Everett Engineering Buildings 7 and 9, respectively. None of the VOCs detected in the groundwater exceeded PCLs. Low concentrations of PCE (36 µg/kg) were detected in the shallow soils beneath Building 7, upgradient of MW-7.

Diesel-range petroleum hydrocarbons were detected in the groundwater in borings completed within the diesel-impacted soils identified east of the Port of Everett Travel Lift/Boat Haul-Out bulkhead. The extent of diesel-range petroleum hydrocarbons was not defined; however, based on the soil data, contamination in this area appears to be bounded to the north by boring SB-98 to the south by, SB-93, to the east SB-104, 105 and 106. The highest concentrations of diesel-range petroleum were detected in SB-94 (6.0 mg/l) which is located down-gradient from the SB-102, which had the highest detected levels of diesel-range petroleum detected in both unsaturated (8,400 mg/kg) and saturated zone soils (4,800 mg/kg).

4.3 MARINE SEDIMENT

Table 4-4 presents a comparison of the RI sediment data to the screening levels identified in the RI/FS Work Plan, namely the Washington State Sediment Management Standards (SMS), composed of the Sediment Quality Standards (SQS) and the less stringent Cleanup Screening Levels (CSL). No SQS or CSL values have been promulgated for organotins. The screening values used in this table for organotins are those used in conjunction with the Puget Sound Dredged Disposal Analysis (PSDDA) program. The working organotins values are informally referred to in this document as though they were SMS criteria.

Both detected values and non-detects that exceed the criteria are highlighted in Table 4-4. Figure 4-7 summarizes the detected concentrations in shallow sediment samples that exceed the screening criteria, as discussed further below. The variation in sediment dredging history for different areas of the Site sediment may contribute to the variation in contaminant distribution found in Site sediment.

4.3.1 Sediment Core Samples

Three sediment cores were collected in the vicinity of ESY during an investigation carried out by the Port of Everett in 2004 (Landau 2004). Cores NMA-core-1 and NMA-core-2 were collected just south and north of the nearshore end of the marine railway, approximately 20 feet from the bulkhead. Core NMA-core-3 was collected approximately 100 feet southwest of the shoreward end of the slip associated with the

Port's Travel Lift. Two samples were prepared and analyzed from each of the three cores.

A sample prepared from the 0.5- to 2.0-foot horizon of core NMA-core-1 had only limited exceedances of the sediment criteria, namely for the PAH acenaphthene and bulk TBT. A deeper sample from this core, collected from 2.0 to 3.9 feet, had exceedances for the PAHs acenaphthene and fluoranthene, copper, mercury, and bulk TBT.

Samples were prepared from the 0.5- to 3.2-foot and 3.2- to 6.3-foot horizons of core NMA-core-2. Both samples exceeded the criteria for numerous PAHs, several SVOCs, multiple metals including copper, mercury, and zinc, and bulk TBT.

The samples for core NMA-core-3 were prepared from the 0.5- to 1.8-foot and 1.8- to 3.1-foot horizons. There were no reported detected analytes that exceeded the criteria in either sample.

A total of six sediment cores were collected during the RI, all in Phase I. Two pairs of cores were collected along the north and south sides of the marine railway. The other two cores were collected from the vicinity of Outfall A near the north end of the Site, and Outfall C, at the south end of the Site.

The work plan (URS, 2008) suggested that samples should be prepared from one-foot core sections, but acknowledged that compositing of longer sections might be necessary to obtain sufficient sample material to support analyses for the full SMS suite. In practice, typically two-foot core sections were found necessary to obtain the needed sample quantity.

The work plan called for samples from the lower end of each sediment core to be analyzed initially, with the other samples from each core analyzed for only those analytes with short holding times, namely porewater tributyltin and mercury, and then frozen for archival. In order to establish the maximum exceedance depth, additional samples from a given core were to be analyzed if the lower sample(s) were found to be free of exceedances.

Native material was found at an approximate depth of 9 feet at location SC-1. A sample from the 7- to 9-foot horizon had no detected concentrations above the screening criteria. The detection limit for one VOC exceeded the SQS in a sample from the 4- to 6-foot horizon in this core. A third sample, from 2 to 4 feet, exceeded the upper criterion for porewater TBT and the SQS for mercury.

Native material was found at a depth of approximately 3.5 feet in core SC-2. No exceedances of the screening criteria were observed in a sample prepared from the 3.5- to 5.5-foot horizon. No detected analytes exceeded the screening criteria in a second sample from the 1.5- to 3.5-foot horizon, but the detection limit for one VOC exceeded the SQS.

The samples initially designated for analysis from cores SC-3, SC-4, SC-5, and SC-6 were found to exceed either the SQS or CSL criteria (Table 4-4).

Core SC-3 was driven to a maximum depth of about 7.5 feet. Native material was not observed in this core. The sample collected from the 4.5- to 6-foot core horizon had marginal exceedances of the SQS levels for Total PCBs and mercury.

Native material was observed in core SC-4 at a depth of approximately 3 feet. The sample from the 3.5- to 5.5-foot horizon had a single exceedance for bulk organotins.

Because native material was observed at a depth of less than one foot in core SC-5, the shallowest sample from this core, representing the 1- to 3-foot horizon, was initially subjected to analysis. This sample exhibited a CSL exceedance for porewater tributyltin. The results also include an SQS exceedance for total PCBs. The total organic carbon result for this sample, used in calculating the carbon-normalized PCB value for comparison to the SMS, was at the lower limit generally considered valid. For comparison, the bulk PCB result slightly exceeded the screening value used by the Dredged Material Management Program. The detection limit for one VOC also slightly exceeded the SQS criterion. Based on these exceedances, the second sample from this core, prepared from the 3- to 5-foot horizon, was also analyzed. The second sample had a detection limit SQS exceedance for the same VOC noted in the first sample. The second sample also had a minor detection limit exceedance of the SQS for porewater organotins.

Native material was observed at a depth of approximately 3 feet in core SC-6. The sample from the 3.5- to 4.75-foot horizon was free of detected concentrations exceeding the screening criteria, but the detection limit for porewater tributyltin exceeded the lower criterion. A second sample from the 0.75- to 2.5-foot horizon exceeded the higher porewater tributyltin criterion as well as the CSL for mercury.

4.3.2 Sediment Grab Samples

Outfall C Area

The only pre-RI sediment sampling known to have been conducted in the vicinity of Outfall C south of the Site involved a single sample collected at a location designated ESY-MS6. Detection limits for two organic compounds exceeded the screening criteria in this sample, but there were no detection exceedances.

RI Phase I sample SG-13, also collected at Outfall C, had exceedances of the SQS criteria for several SVOCs and a CSL exceedance for BEHP. Figure 4-7 summarizes the SMS exceedances for detected analytes by location. This figure also shows exceedances of the SMS for detected analytes in historical (2003 and 2004) sampling.

To assess whether the limited exceedances at location SG-13 pose a risk to biota and potentially overrule the chemical exceedances as allowed under the SMS, this location was resampled in Phase II to conduct bioassays, designating the new sample as SG-31. Sample SG-31 was analyzed for the sediment conventionals and used in conducting bioassays using *Mytilus*, *Neanthes*, and *Eohaustorius* species.

The results of the Phase II bioassays can be summarized as follows. The percent fines of the reference sample and test sample were quite similar, at 78 and 68 percent fines, respectively. The acute amphipod bioassay was performed using *Eohaustorious estuarius*. The mortality in the test sample was more than 30 percent greater than in the reference sediment, so the test sample was deemed to have failed the acute amphipod bioassay. The acute larval bioassay used *Mytilus galloprovincialis*. The reference sample collected in Holmes Harbor on Whidbey Island did not perform well on the larval bioassay. The SMS has no reference sample performance criterion, but the criterion developed for use in the Dredged Material Management Program (DMMP) is sometimes used to assess reference sample performance. This criterion involves comparing the number of normal surviving larvae in the reference sample to the results for the seawater control. The reference sample did not meet the DMMP criterion, having considerably fewer normal survivors than in the control. The test sediment had substantially more normal survivors than the reference sediment and only moderately fewer than the seawater control. This test was interpreted to have been passed. The chronic polychaete bioassay utilized *Neanthes arenaceodentata*. Since the growth rate for the polychaete worms was slightly higher in the test sediment than in the reference sediment, this bioassay was also passed. Overall, because of the acute amphipod result, the SG-31 sediment was interpreted to have failed the bioassays.

As a contingency in case the bioassays were not successful, three new locations distributed in an arc around and approximately 40 feet from the SG-13/SG-31 location were sampled in Phase II. These three samples were analyzed for the sediment conventional parameters and archived pending completion of the bioassays. After sample SG-31 was reported to have failed the bioassays, the three archived samples were analyzed for SVOCs. There were no exceedances in any of these three samples for the compounds found in exceedance in Sample SG-13. However, Sample SG-32 exceeded the CSL for the SVOC 4-Methylphenol by a factor of approximately 2 and SG-33 had a marginal exceedance of the CSL for this same SVOC. These two samples also had detection limit exceedances of the SQS for one VOC and one pesticide. Sample SG-34 had only detection limit exceedances of the SQS for the same VOC and pesticide.

The SVOC 4-Methylphenol was detected below the criteria in Sample SG-34 but was not detected in original Phase I sample SG-13. There are a number of possible explanations for the lack of an exceedance of the screening criterion for 4-Methylphenol in sample SG-13, collected in closest proximity to Outfall C, including:

- The outfall is not the source of the 4-Methylphenol;
- Releases of the compound from the outfall have been sporadic; or
- 4-Methylphenol close to the outfall has broken down into other chemicals or been transported away.

One common source of 4-Methylphenol is coal tar, and the compound is commonly found in creosote, which is derived from coal tar. However, if creosote were the source of the 4-Methylphenol, e.g. via release from creosote-treated pilings in the marina, it would seem logical to find the compound accompanied by comparable concentrations of the numerous other PAHs common to coal tar and creosote. However, none of the PAHs were found in exceedance of the criteria in any of the three Phase II samples. 4-Methylphenol is also a hydroxylation product of toluene. Toluene is a primary constituent of most gasoline formulations, and the 4-Methylphenol found in the Outfall C area may be a result of historical over-water gasoline releases.

Phase II locations SG-32 and SG-33 were resampled in Phase III in order to run bioassays and possibly overrule the chemical exceedances observed at these locations in Phase II. These locations were renumbered SG-36 and SG-37, respectively, for the Phase III sampling. The Phase III bioassays utilized *Mytilus galloprovincialis* and *Neanthes* *arenaceodentata*, as in Phase II. However, because of the high fines content observed at these locations, a field change was made in consultation with Ecology to use *Ampelisca abdita*, a species comparatively tolerant of fine-grained sediments, for the acute amphipod test in Phase III instead of *Eohaustorious*.

Field wet-screening procedures were used to attempt to match the percent total fine grain sediments in the test samples with one or more reference samples. The subsequent laboratory analysis demonstrated that the Phase III samples in the Outfall C area had very high total fines, routinely in excess of 90 percent. Samples SG-36 and SG-37, used in the bioassays, had total fines of 90 and 96 percent. The reference sample collected in Holmes Harbor had total fines of 69 percent.

The percent mortalities for *Ampelisca* were lower in the test sediments than for the reference sediment, so this bioassay was passed. The number of normal surviving *Mytilus* larvae was considerably higher in the test sediments than in the reference, so this bioassay was also passed. The individual growth rate reported for *Neanthes* in the test sediments was significantly lower than in the reference sediment but met the numerical criteria, so this test was also passed. Overall the sediments from locations SG-36 and SG-37 both passed the Phase III bioassays.

Because samples SG-36 and SG-37 passed the bioassays, no additional analyses were performed on archived grab samples SG-38 through SG-46 collected as a contingency in case of bioassay failure.

Bulkhead South of Former Tidal Grid

The RI Phase I grab samples collected from locations SG-10, SG-11, and SG-12 along the bulkhead south of the former Tidal Grid location were free of exceedances of the SMS.

Former Tidal Grid to Travel Lift and West Bulkhead

The nearshore sediments between the former Tidal Grid location and the bulkhead just west of the Travel Lift contain a variety of contaminants in the surface sediments at concentrations in exceedance of the SQS. The band of contamination reaches an average of approximately 60 feet offshore. These nearshore sediments can be divided into four subareas based on differing patterns of contamination. These contamination patterns may be partly a result of historical navigation dredging in the North Marina. Sediments in the vicinity of the marine railway contain a variety of hazardous substances exceeding the SQS, including SVOCs, metals, and TBT. Sediments around Outfall A exhibit exceedances only for TBT. Sediments around the Travel Lift and the bulkhead to the west contain a variety of hazardous substances exceeding the SQS, including several SVOCs, the metals copper and zinc, and TBT. A variety of contaminants has also been found in the mix of backfill and sediment contained between the upper and lower bulkheads stretching from Outfall A to the Travel Lift and west to the newer sheetpile bulkhead. Additional details of the findings for these four subareas are provided below.

Marine Railway Vicinity

Ten of the 14 locations in the general vicinity of the marine railway where grab samples were collected and analyzed during the RI had no analytes that exceeded the state criteria

(Table 4-4). This includes locations SG-2, SG-5, SG-6, SG-7, SG-8, SG-18, SG-19, SG-20, SG-21, and SG-22.

Sample SG-1 had exceedances of the screening criteria for several SVOCs, for both bulk and porewater TBT, and for several metals, including mercury.

Sample SG-3 had a single exceedance of the criterion for bulk TBT.

Sample SG-4 had exceedances of the screening criteria for numerous SVOCs.

Sample SG-9 had a minor exceedance of the SQS for one SVOC, exceedances of the higher screening value for both bulk and porewater TBT, and of the CSL for lead.

Because none of the initially analyzed samples in the outermost tier around the marine railway exhibited any exceedances of the state criteria, no analysis was performed on the four archived samples from locations SG-24 through SG-27.

Several samples collected from the vicinity of the marine railway and analyzed during two pre-RI events also had exceedances of various screening criteria. Sample ESY-MS3 had exceedances for several SVOCs, several metals, and both bulk and porewater TBT. Sample ESY-MS5 also had exceedances for several SVOCs, two metals, and porewater TBT. Sample NMA-Grab9 had an exceedance for porewater TBT.

Outfall A Area

Samples SG-14 and SG-15, collected in the nearshore area just south and north of Outfall A, had exceedances of the screening criteria only for TBT. SG-14 had an exceedance for bulk TBT, while SG-15 had exceedances for both bulk and porewater TBT.

Pre-RI sample ESY-MS1 had exceedances for bulk and porewater TBT. Pre-RI sample NMA-Grab8 had an exceedance for porewater TBT.

Travel Lift and West Bulkhead

Sample SG-16, collected in the vicinity of the Travel Lift, had exceedances for two SVOCs, for bulk and porewater TBT, and for copper and zinc.

Sample SG-17, collected at the Travel Lift, had a comparatively minor SQS exceedance for one SVOC as well as exceedances for bulk and porewater TBT and one metal.

Sample SG-23, collected west of the Travel Lift, had a minor SQS exceedance for one SVOC and exceedances for both bulk and porewater TBT.

Samples SG-28, SG-29, and SG-30 were collected around location SG-23 in Phase II with the goal of better defining the limits of the exceedances found at SG-23. Each of these three samples had between two and six detection limit exceedances of the screening criteria, but no detected value exceedances.

Bulkhead Sediments

The sediments between the dual timber bulkheads running between Outfall A and the Travel Lift and west to the newer sheetpile bulkhead were characterized in May and June 2010 using manual sampling methods. Shallow grab samples from 0 to 10 cm in depth and subsurface grab samples from 2 to 3 feet in depth were collected at six locations (BC-1 through BC-6) approximately evenly distributed throughout this narrow band of bulkhead sediments. Four additional locations (BC-7 through BC-10) at and north of

Outfall A were subsequently investigated and sampled in response to observations of apparent petroleum contamination in the area of bulkhead locations BC-1 and BC-2 including evidence of non-aqueous phase liquid (NAPL) at a depth of approximately 1.8 feet bgs at location BC-1. Subsurface grab samples were collected from depths of up to 4 feet at BC-7 through BC-10.

Exceedances of the SMS criteria were found to be widespread in the shallow bulkhead sediments (Table 4-4). Multiple SVOCs were found to exceed the criteria at locations BC-1 through BC-6. PCBs were found to exceed the SMS criteria at locations BC-1 through BC-5. Both bulk and porewater TBT also exceeded the working criteria at locations BC-1 through BC-5. Multiple metals including arsenic, copper, lead, mercury, silver, and zinc also exceeded the criteria in one or more of these five locations.

The subsurface samples from locations BC-1 through BC-6 also exhibited exceedances for a smaller number of analytes, typically at lower concentrations than the shallow samples.

Based on initial bulkhead field observations consistent with petroleum contamination, several samples were submitted for hydrocarbon screening (HCID) analysis in addition to the original planned lab work. As noted, four additional locations in the vicinity of BC-1 and BC-2 were also investigated for evidence of petroleum contamination and submitted for HCID analysis. Those samples that exceeded HCID reporting limits were also subjected to extended petroleum analysis (NWTPH-Dx) to quantify detected petroleum fractions.

Overall, the results of the hydrocarbon analyses performed on the bulkhead sediments suggest the presence of a plume of petroleum contamination in the bulkhead material centered on locations BC-1 and BC-10. The highest concentrations tend to occur at depths of from 1.5 to 4 feet. Both diesel- and oil-range petroleum hydrocarbons are detected in this area, with diesel the predominant fraction. Concentrations diminish moving north; a sample from location BC-9 did not exceed the HCID reporting limits, although both diesel and oil were detected at low concentrations in the subsurface sample from location BC-2.

Evidence of petroleum was also found in the surface sample from location BC-4, west of the Travel Lift. This sample exceeded the HCID reporting limits and had moderately elevated detections of both diesel and oil fractions in the NWTPH-Dx analysis.

5.0 CONCEPTUAL SITE MODEL

This section presents a conceptual site model that identifies potential and/or suspected sources of hazardous substances, the types of hazardous substances detected in site media, transport mechanisms, and actual and potential exposures pathways and receptors.

5.1 POTENTIAL SOURCE AREAS

5.1.1 Primary Sources: Everett Shipyard and Everett Engineering Operations

Historical Site development and facility operations including suspected chemical use are summarized in Table 1-1. Primary sources of contamination associated with Site activities were abrasive blasting and painting operations from the Everett Shipyard and machining operations from Everett Engineering as discussed below.

- **Everett Shipyard –** The abrasive blasting and painting operations were historically conducted outside buildings primarily within the central and southwestern portions of the Site. Abrasive blasting operations reportedly began in the 1960s when the shipyard or its customers began to work on metal boats. Aerial photographs, interviews and Site observations indicate that significant quantities of abrasive grit accumulated in this area. Historically, copper slag was reportedly used as grit and may have resulted in release of copper and other metals into surface soils. Other abrasives (e.g., Kleen Blast and Green Diamond) were used for blasting and may also have released metals into the environment. Metals and antifouling agents, such as TBT, and other marine paint additives such as PCBs could also have been released during the blasting process as coatings were removed from vessels. Paint and solvent use and storage at the Site may also have resulted in accidental releases. Other hazardous substances used and stored at the Site included gasoline, heating oil, paints, solvents, cutting oils, glues, hydraulic oil, creosote, rust preventers, and antifreeze. Areas where these hazardous substances were used and stored are potential source areas. Other potential sources of petroleum hydrocarbons and/or cPAHs related to Everett Shipyard activities include the AST associated with the steam box, existing and former USTs, treated wood, and creosote.

- **Everett Engineering –** Everett Engineering conducted machining operations in three buildings on the eastern part of the Site and used significant quantities of cutting oil and lube oil with smaller quantities of solvents. The interior of these buildings were described in 2001 by Landau as well maintained (Landau, 2001). Since that time, the machinery previously installed and operated in the buildings has been removed and staining on the concrete floors in the buildings is evident. Inside Building 7, a sub-slab was constructed below the top floor slab and the soil between the two slabs appears to have been impacted, likely by oils Everett Engineering used in the machining operations. Other floor penetrations inside these building provide potential conduits for releases inside the buildings to reach the subsurface. In addition, the former compressor located near the northwest corner of the Everett Engineering maintenance shop appears to have been the source of a release of oil.

There is a limited potential for significant releases within the on-site buildings used by ESY due to the relatively small quantities of chemicals used in these buildings (see Table 1-1), and the integrity of the concrete/asphalt floors within most of the structures. Prior to construction of the Everett Engineering buildings, this area appears to have been used for vessel maintenance and some of the impacts in the soil beneath these buildings appear to be related to these historical activities rather than from releases inside the buildings. Similarly, impacts beneath the buildings used by ESY may be related to activities prior to building construction.

5.1.2 Other Potential Sources

The Site and surrounding area were also utilized by others including some operations by the Port. Examples include:

- An aboveground storage tank (AST) owned by the Port: Prior to 1998, the Port maintained a used oil collection facility adjacent to the southwest corner of Site (Figure 1-2). Potential releases associated with the AST may have impacted the Site.
- The net dipping operation: A net dipping operations was identified on Sanborn maps from the 1950s in the southeastern portion of the Site and north of the former Net Shed building. Historical information on techniques for preserving fishing nets indicates that one method of treatment involved the use of tar-based coatings to extend their useful life (Robertson, 1931). Based on this, the net dipping operation is considered to be a potential source of petroleum and cPAHs in the southeast corner of the Site.
- Boat Maintenance: While mechanical repairs were not routinely performed at the shipyard, boat owners were historically allowed to perform boat maintenance on the Site, and as a result, may have released indicator hazardous substances including petroleum products and cPAHs.

In addition to these operations, other potential sources of hazardous substances and operations in the North Marina area may have impacted areas on or adjacent to the upland and in-water portions of the Site, including:

- Businesses and operations north and northwest (e.g., former Everett Bayside Marine, Inc.) of the Site where hazardous substances may have been used and released into catch basins connected to outfalls along the bulkhead in the vicinity of the Travel Lift;
- Vessels transiting and moored within the marina area represent additional sources of potential sediment contamination, including releases of petroleum fuels and lubricants and leaching of hull coatings;
- Operations at the Port's former Tidal Grid located south of the marine railway, including boat maintenance and painting over water;

- The Port's Travel Lift and Boat Haul-out operation located northwest of the Site, historically used for boat washing and painting operations directly over water;
- A crane that was located near the south of end of the deck associated with the current Travel Lift and Boat Haul-out, that was used by the Port and others to lift boats in and out of the water prior to use of the current haul-out;
- Historical marine servicing and maintenance operations located north of the Port's Travel Lift and Boat Haul-out that may have discharged chemicals to the North Marina as overland flow or via outfalls that have been observed north and west of Outfall A;
- Operations within and adjacent to the building directly to the north of the Site (the Mall or Harbor Marine building) where metal grinding has occurred, oil staining has been observed on the pavement, and subsurface magnetic anomalies potentially representing USTs have been identified during the Phase III Geophysical Survey;
- Parked vehicles and other historical operations located along 14th Street north of the Site, between the Lease Area and the bulkhead and on the north side of the former Net Shed building that have existed for approximately 60 years;
- Chemically-treated wooden pilings along the bulkhead west of the Site and associated with the marine railway and marina;
- The use of oil to suppress dust when the area surrounding the Lease Area was unpaved; as reported by Everett Shipyard personnel;
- Fill material placed beneath roadways and buildings (i.e., base course or foundation fill) prior to construction which analyses have shown to contain concentrations of cPAHs exceeding PCLs (see results for borings SB-62, SB-63, SB-68, and SB-89); and
- Historical operations related to the Net Shed building and a small motor repair station located near the west end of the Net Shed building.

5.2 HAZARDOUS SUBSTANCES DETECTED IN UPLAND SOURCE AREAS

Metals (antimony, arsenic, copper and lead) have been detected in shallow soil throughout most of the Site not currently covered by buildings or pavement at concentrations exceeding PCLs. The areas with elevated metals in soil are generally consistent with the apparent extent of historical abrasive blasting operations at the Site. The highest concentrations of metals in soil were detected at a depth of approximately one foot or less and appear to be associated with the presence of abrasive grit which had previously accumulated on the ground surface. Metal concentrations generally decreased with depth and with only a few exceptions, metal concentrations in soil samples collected from 3 feet bgs did not exceed PCLs. This suggests limited vertical mobility of metals in soil at the site. PCBs, where detected, were generally co-located with elevated concentrations of metals. The highest concentrations of PCBs were detected in shallow soils beneath and adjacent to Building 9.

Petroleum hydrocarbon and cPAHs detections in soil were widespread. However, petroleum hydrocarbon concentrations (diesel and oil) exceeding the PCL (based on MTCA Method A soil cleanup levels) were limited to three general areas during Phases I and II including: beneath Building 7, adjacent to the former waste oil AST operated by the Port in the southwest corner of the Site, and the west central portion of the Site (Figure 4-5a). Carcinogenic PAHs were detected above the PCL throughout the upland portion of the Site. In the area to the south and west of the Lease Area, the cPAHs were the only constituents that exceeded PCLs suggesting that the type of the operations in these areas was different than within the Lease Area where cPAH exceedances are generally co-located with metals.

During Phase III, diesel-range petroleum hydrocarbon affected soils were encountered at concentrations exceeding the PCL (2,000 mg/kg) in samples collected from 6 of the 15 borings completed east of the Port of Everett Travel Lift Boat Haul-Out bulkhead identified area (Figures 4-2 and 4-5b). The distribution of hydrocarbons (e.g., shallow depth and concentration) suggests that the source was located near south of the Harbor Marine building near borings SB-100, SB-101 and/or SB-102. Based on the geophysical survey results (see Section 3.3.3), two metallic features (Figure 4-5b) were identified east of the borings SB-100 and SB-101. These features are suspected UST locations and may be the potential source of the petroleum hydrocarbon contamination. Based on the given sampling results the southern extent of impacted soil appears to be bounded by results from borings SB-93 and SB-103 and the eastern extent of impacted soil is partially bounded by results from borings SB-104 through SB-107.

VOCs, SVOCs and organotins were detected in the soil at the Site, but not at concentrations exceeding preliminary soil cleanup levels.

5.3 TRANSPORT MECHANISMS

Contaminants associated with marine vessel maintenance/repair activities that were released in the upland operations areas within the Site may have migrated beyond the Lease Area boundary in storm water runoff. Aerial deposition of wind blown particulates may have also dispersed contaminants (primarily during abrasive blasting operations) throughout both the upland an in-water portions of the Site. Contaminants may also have leached from the soil and migrated laterally and downward into the underlying groundwater which flows into the adjacent North Marina. Surface water discharges (e.g., overland flow and via stormwater outfalls) into the North Marina and contaminant releases directly into the marina would potentially accumulate in sediment which may be re-suspended and dispersed by several mechanisms. Each of these transports mechanisms and its significance is described further below.

5.3.1 Stormwater Run-off and Outfalls

Prior to the installation of catch basins at the Site, stormwater from the Site was managed primarily via infiltration, and contaminants released to surface soil may have been transported in storm water runoff onto adjacent unpaved areas depending on infiltration rates and Site grades. However, operational areas surrounding the vessel skids in the southwestern and central portions of the Site were maintained at an elevation below the surrounding grade level to facilitate access to the boats in the shipyard. Although the concrete footings for the westernmost skids form a nearly continuous barrier to storm water flow along the southwestern boundary of the Lease Area, it was common practice to allow sand-blast grit to accumulate in the work yard until elevations interfered with operations and accumulations of sandblast grit were observed west of the skids on the paved surface of Montague street till early 2010 (see discussion in Section 1.3.2 under *Handling of Stormwater and Surface Runoff Water*).

Soil at the Site consists of silty, sandy fill that appears, based on minimal evidence of significant ponding or overland flow in unpaved areas, to be conducive to infiltration throughout most of the unpaved portion of the Site. The unpaved road that historically bordered the Site on the north, west, and south reportedly had a "crown" in the middle that would generally minimize overland flow from crossing the road except during heavy precipitation periods. It is noted that the conditions described above may have helped reduce the impact from surface water runoff from these areas of the Site. Results of soil testing adjacent to the Lease Area generally support this finding, with the exception of the area near the northeast corner of the Lease Area where soil impacted with both metals and cPAHs has been detected beneath the recently constructed sidewalk and the area immediately south of Building 9 where metals, cPAHs and PCBs were detected. The remainder of the soil impacts adjacent to the Lease Area boundary is limited to cPAHs.

Catch basins were eventually installed on and adjacent to the Site, but the date of installation is not known. Storm water runoff from the Lease Area was collected in catch basins that discharged to the North Marina from Outfalls 001 and 002 located adjacent to the marine railway (Figure 1-3). In 2002, the catch basins previously connected to Outfall 002 were reconfigured to discharge into the sanitary sewer system. An additional catch basin was installed in 2008. Surface water from a small area adjacent to the marine railway continues to discharge to the marina as sheet flow. Outfall A is connected to a catch basin located northwest of the Weld Shop near the northern part of the Site. Outfall B is connected to a series of catch basins located west and south of the operational yard. Outfall C was reported by Landau (2003) to have been connected historically to catch basins located south of the Site; however, dye testing did not confirm the connection between the two catch basins (Outfalls Unk-2 and-3) in this area and Outfall C, which may be the result of a clogged drain line or a break in the system. It is noted that a 1996 Port of Everett map depicting the storm sewer system at North Marina shows a connection between catch basins Unk-2 and -3 and Outfall C. Storm drain sediment at catch basin Unk-3 (sampled by Landau in 2003) and sediments associated with Outfall C (see RI results for SG-13) both contain concentrations of TBT, suggesting that Outfall C may be a source for TBT. TBT concentrations in sediment sampled just north of Outfall C (see RI results for SG-12) show a TBT concentration that is about 5 times less than what was detected at Outfall C (sample location SG-13).

Analysis of accumulated solids in the catch basins in 2003 revealed elevated levels of arsenic, copper, zinc and TBT, indicating that releases from Site sources and/or off-site sources had likely entered one or more of the catch basins. Periodic monitoring of storm water discharges from 1999 to 2002 confirmed the presence of low levels of copper, lead and zinc in storm water discharges at Outfall 001. Other metals, TBT, and petroleum hydrocarbons were also likely discharged to the marina from this former outfall. These contaminants and sediment would tend to settle relatively close to the outfall given the protected nature of the marina and the relatively calm waters.

5.3.2 Air & Soil Vapor

Airborne material has also accumulated within, and adjacent to, work areas during abrasive blasting operations. This material had the potential to be redistributed to other upland areas within the Site and beyond (e.g., eastern portion of the Site along West Marine View Drive) the Lease Area as a result of wind re-suspension as fugitive dust during periods of significant wind velocity and/or operations. Similarly, fine airborne particulates may have been transported into the adjacent sediment and surface water body before thorough removal from the ground surface. As such, historical ESY operations had likely impacted both uplands and in-water of the Site that is well beyond Leasehold boundary via this type of transport mechanism. Results of soil testing adjacent to the Lease Area have not detected elevated concentrations of metals that would be expected if fugitive dust from blasting operations accumulating outside the Lease Area was significant. The soil data indicate that this pathway has not significantly impacted soil, with the possible exception of the area near northeast corner of the Site where impacted soil has been detected beneath the recently constructed sidewalk. In addition, the sediment analysis results immediately west of the Lease Area were below PCLs (e.g., SG-10, 11, and 12.)

Based on the VOC concentrations identified in the Site soils and groundwater, soil vapor concentrations, and the potential for vapor intrusion related impacts to indoor air quality are low. VOCs detected in the Site soils included PCE (SB-2; 13 µg/kg) and methylene chloride (SB-19; 3.1 µg/kg). Low concentrations of PCE, EDC, 1,1,2,2-tetrachloroethene and chloromethane were detected in the groundwater. PCE was detected in groundwater at two locations, SB-07 (0.074 µg/L) and MW-7 (0.09 to 0.2 µg/L), located beneath and downgradient of Buildings 7 and 9, respectively. Other VOCs detected in the groundwater included low concentrations of acetone, chloromethane, and MTBE. None of the VOCs detected in the Site soils or groundwater exceeded their respective PCLs. The VOC concentrations noted at the Site do not indicate that significant releases of solvents/degreasers, or other VOC-containing products have occurred. Thus, no apparent impacts to indoor air quality as a result of vapor intrusion associated with VOCs in soils and groundwater exist at the Site.

5.3.3 Groundwater

The saturated zone at the Site occurs within the hydraulic fill material and groundwater levels range from approximately 3 to 6 feet bgs. Fluctuations in groundwater levels were evident in response to tidal effects and local recharge following periods of precipitation. The groundwater flow direction is inferred to be predominantly westerly toward the marina.

Groundwater contamination at the Site appears to be sporadic and limited in lateral extent. Low level exceedances of PCLs were only identified in monitoring wells MW-2, MW-4, MW-6, and MW-7. Several of the groundwater samples were collected in close proximity to or downgradient of areas with elevated concentrations of metals, cPAHs, PCBs and/or petroleum hydrocarbons in shallow soil. Only selected metals (arsenic, nickel and zinc) and one SVOC (BEHP) were detected in groundwater detected above

PCLs. In the central eastern portions of the Site, none of these constituents were consistently detected above the PCLs. With the exception of dissolved arsenic, none of the downgradient wells located along the western side of the Site exhibit contaminant levels exceeding PCLs. The highest levels of dissolved arsenic were noted in the southwestern corner of the site (MW-4) with concentrations ranging from 0.006 mg/L to 0.02 mg/L. Significant levels of arsenic were not identified in the marine sediments samples collected along the bulkhead near this well.

Groundwater beneath the Site is not used for drinking water and groundwater should not be considered potable due to the proximity to marine waters and high level of salinity as outlined in WAC 173-340-720(2)(d). A review of available water well log logs did not identify any domestic or municipal water supply wells within a one-mile radius of the Site (URS, 2008). Groundwater flows west toward the North Marina. Therefore, Site contaminant transport to water supply wells is highly unlikely and the risk associated with the potential exposure to groundwater via human ingestion is not considered significant.

5.3.4 Marine Sediments

Vessel operations and navigation dredging within the North Marina have the potential to re-suspend and redistribute shallow sediments (e.g., through prop wash, particularly at low tide). Navigation dredging would also re-suspend and redistribute sediments. However, the sediment sampling results show contamination in exceedance of the criteria largely confined to a nearshore band of sediments reaching approximately 40 to 60 feet from shore.

The results of sediment sampling do not show any clear and consistent pattern of longshore current transport of contaminated sediments along the bulkheads. For example, bulkhead samples collected north of location SG-13 at the south end of the site near Outfall C did not exhibit any exceedances for the SVOCs found to be in exceedance at SG-13.

The pattern of contamination is more complex in the north Site area, from the former Tidal Grid to the Travel Lift. There appear to be four subareas here with relatively distinct patterns of contamination, as summarized below. If sediments were being transported along the bulkhead, the pattern of nearshore sediment contamination would likely be more uniform. Historical dredging in the marina may have influenced the distribution of contaminated nearshore sediments in this area (see Appendix G). For example, 1990 dredging potentially reached to within 20 feet of the bulkhead in most of this area, but a buffer was left around the marine railway and adjacent floating dock. Dredging in 2002 potentially removed sediments adjacent to the north side of the floating dock and other floating structures to the north, but left sediments south of the floating dock undisturbed.

Sediments in the nearshore area around the marine railway and floating dock appear to have been minimally affected by historical navigation dredging. Samples collected from this area have displayed a comparatively wide range of contaminants exceeding the screening criteria. Sediment contamination observed in this area likely reflects a combination of impacts from multiple sources, including discharges from Outfall 001 as well as other historical outfalls in this area, overland flow from the sloping pavement around the end of the railway, and operations at the Tidal Grid, and possibly airborne particulates from abrasive blasting operations conducted near the railway. Several RI samples and historical samples from this area exhibit exceedances for multiple SVOCs, several metals, and both bulk and porewater TBT.

A second subarea to the north consists of the nearshore sediments in the vicinity of Outfall A, which is believed to drain the extreme north end of the Site as well as a portion of 14th Street and the facilities to the north. The sediment contamination observed in this area differs from that found in the railway/floating pier area. The only chemicals exceeding the screening criteria in the samples collected from nearshore sediments at Outfall A are bulk and porewater TBT. The lack of exceedances of the SVOCs and metals found to exceed the criteria in the railway subarea suggests that there is at most a limited potential for sediments to be transported north along the bulkhead.

A third subarea consists of the nearshore sediments in the vicinity of the Travel Lift and the area to the west. The exceedances of the screening criteria found in this area again involve a comparatively diverse collection of analytes, including a comparatively high exceedance for one SVOC only rarely detected in the RI data set, several metals, and bulk and porewater TBT. The difference in the pattern of contamination between this subarea and the adjacent Outfall A subarea suggests that the potential for sediment to be transported along the shoreline may be limited. Phase III sediment analyses detected high concentrations of contaminants adjacent to four outfalls in this area, which do not receive runoff from the Site. Therefore, the sediment contamination found at the Travel Lift and in the area to the west appears likely to be at least partially the result of releases associated with operations at the Travel Lift and discharges through stormwater outfalls located in the dual timber bulkhead between Outfall A, the Travel Lift, and west to the sheetpile.

The fourth area of contaminated sediments in the north Site area consists of the material between the lower and upper bulkheads that make up the dual timber bulkhead running from Outfall A north to the Travel Lift and then west to the newer sheetpile bulkhead. This material, informally referred to as sediment, likely consists of a mixture of backfill materials placed during bulkhead construction, marine sediments deposited between the bulkheads, and materials discharged through a series of five outfalls that penetrate the upper bulkhead. Each outfall represents a potential source and only one of the outfalls (Outfall A) has been investigated. These bulkhead materials may act to retain any contaminants discharged from the uplands area. However, tidal action could tend to flush non-aqueous phase materials such as petroleum as well as water-soluble contaminants into the adjacent marina area. Staining that resembles petroleum can be seen on the outer surface of the lower bulkhead in the vicinity of locations BC-1 and BC-2, and surface sheens have been observed in the marine water in this area. The diesel-range petroleum hydrocarbons in the sediment at BC-1 and BC-2 appears to be the result of migration of the upland contamination from encountered in borings located directly east of the bulkhead (Figure 4-5b). The petroleum hydrocarbons appear to have migrated through the bulkhead at a depth approximately corresponding to groundwater table which is expected to fluctuate significantly in this area in response to the tides.

As described above in Section 5.2, there are numerous other potential sources of hazardous substances adjacent to the Site. Releases of chemicals from these sources would be subject to similar transport mechanisms, including overland flow into catch basins connected to outfalls that discharge into the North Marina, and may have co-mingled with releases from the Site.

5.4 POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS

The Site and adjoining areas are currently used for commercial purposes and marina operations. The Site is zoned Waterfront Commercial and the current redevelopment agreement with the City of Everett states the Site will be used for commercial and public access uses that may include residential use. The Port indicated that it may seek a modification to the agreement to allow for a different mix of uses, including commercial development such as professional office space and retail shopping. However, this would not completely rule out the possibility that the Site could be used for residential purposes based on its current zoning.

Construction workers, current and future commercial/industrial workers, marina users, site visitors, and future residents could be exposed to contaminants present at the Site.

Potentially significant current and future exposure pathways at the Site are:

- Soil
  - Human direct contact (i.e., ingestion and dermal exposure) with soil by construction and site maintenance workers, and future tenants or residents. It's noted that the data collected from the RI indicates that contaminant transport from soil to the underlying groundwater and then to the marina appears to be limited.
- Air
  - Exposure through inhalation of soil contaminants that have migrated to air as windblown/fugitive dust. Receptors may include site trespassers, construction and site maintenance workers, and future residents. This potential pathway also includes future indoor air exposure to commercial workers/residents who may occupy on-site buildings.
- Groundwater
  - Human dermal contact with shallow groundwater by construction and site maintenance workers.
- Marine Sediment
  - Direct human contact with sediments which would likely be limited to dredging operations and construction activity during cleanup because access to sediments is limited in this area.
  - Aquatic species including benthic invertebrates and fish can come in contact with marine sediments in the North Marina. Contaminants such as mercury have the potential to bioaccumulate in tissues and can be further concentrated moving up the food chain, ultimately potentially leading to exposures by fish including Chinook salmon, steelhead and bull trout which are threatened species, marine mammals, birds, and humans.

5.5 TERRESTRIAL ECOLOGICAL EVALUATION

As described in the *Final RI/FS Work Plan* (URS, 2008), the quality of the terrestrial habitat at the Site is low and the nearby habitat is limited and isolated from the Site. The undeveloped land is also unlikely to attract wildlife, and future redevelopment would include covering a large portion of the Site with buildings or pavement. Therefore, substantial exposure to terrestrial ecological receptors is unlikely and further terrestrial ecological evaluation was not warranted under WAC 173-340-7492 (2)(a)(ii). A worksheet documenting the analysis required under WAC 173-340-7492 is included in Appendix J.

6.0 CLEANUP ACTION OBJECTIVES AND PRELIMINARY CLEANUP STANDARDS AND REMEDIATION LEVELS

This section presents cleanup action objectives (CAOs) (also referred to as remedial action objectives, RAOs) and preliminary cleanup standards and remediation levels proposed for the Site. The CAOs and preliminary cleanup standards and remediation levels proposed for the Site are based upon an evaluation of the Conceptual Site Model (CSM) presented in Section 5.0 of this Report. The pathways presented in the CSM form the basis for establishing the CAOs and cleanup levels for groundwater, soil and marine sediment at the Site.

6.1 CLEANUP ACTION OBJECTIVES

The CAOs, referred to in the Agreed Order as RAOs, consist of chemical- and media-specific goals for the protection of human health and the environment and are intended to assist in focusing the development and evaluation of cleanup action alternatives. The CAOs specify the impacted media and contaminants of concern, potential exposure routes and receptors, and proposed cleanup goals defined in this subsection. The CAOs for the uplands and marine sediments are presented below in Section 6.1.1 and 6.1.2, respectively.

6.1.1 Uplands

The CAOs for the Uplands Area are to protect human health and the environment by eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route. Specifically, the CAOs for the Uplands Area are to mitigate risks associated with Site indicator hazardous substances for the following potential exposure pathways and migration routes:

- Direct contact (dermal, incidental ingestion, and inhalation) by visitors, workers (including construction and maintenance workers), and other Site users with indicator hazardous substances in soil and fugitive dust exceeding PCLs;
- Direct contact (dermal and incidental ingestion) by construction workers and site maintenance workers with indicator hazardous substances in groundwater exceeding PCLs;
- Exposure of marine aquatic organisms to hazardous substances at concentrations above the groundwater preliminary cleanup levels which are based on protection of marine surface water. This CAO is applicable at the downgradient point of compliance, which is generally defined as the shoreline to the North Marina; and
- Contaminated soil and abrasive grit migration to adjacent marine sediment and surface water in stormwater run-off and possibly windblown/fugitive dust.

The degree to which each cleanup action alternatives meets these objectives will be determined by applying the specific criteria identified in WAC 173-340-350(8) and -355.

6.1.2 Marine Sediments

The CAOs for the Marine Area are to eliminate, reduce, or otherwise control, unacceptable risks to the environment posed by site-specific indicator hazardous substances in marine sediment. Specifically, the CAOs for the Marine Area are to mitigate risks associated with Site indicator hazardous substances based on exposure of benthic organisms to concentrations exceeding cleanup levels (CLs) in the biologically active zone of sediment (i.e., the upper 10 cm below the mudline). There are several chemicals of concern that have the ability to bioaccumulate in the environment. The marine area at the Site is not considered under the provisions of the Sediment Evaluation Framework (SEF), because a dredge to native sediments is expected.

6.2 PRELIMINARY CLEANUP STANDARDS

Cleanup standards consist of cleanup levels that are protective of human health and the environment, the points of compliance at which the cleanup levels must be met, and the additional regulatory requirements that apply to the cleanup action because of the type of action and/or location of the Site (WAC 173-340-200). Preliminary cleanup levels (PCLs) were presented in the *Preliminary RI Data Report* (URS, 2009a) and the *Preliminary Phase II RI Data Submittal* (URS, 2010a) for the uplands and marine sediment portions of the Site. These PCLs are expected to be adopted as final cleanup levels by Ecology in the Cleanup Action Plan (CAP) and serve as the basis for the evaluation of the alternatives and the selection of the preferred cleanup action presented in this FS. These media-specific cleanup levels and points of compliance are summarized below in Sections 6.2.1 and 6.2.2.

6.2.1 Cleanup Levels

Preliminary cleanup levels for the Site are based upon an evaluation of the Conceptual Site Model (CSM) presented in Section 5.0 of this Report. The pathways presented in the CSM form the basis for establishing the groundwater, soil, and sediment cleanup levels at the Site. Based upon the CSM, the following PCLs have been established for the site:

- For groundwater, PCLs based upon the protection of the marine surface water resources beneficial uses under WAC 173-340-720(4)(b)(ii).
- For soil, PCLs based upon the protection of human health via direct contact, or residual saturation levels for petroleum hydrocarbons, using MTCA Method A or B for unrestricted land use under WAC 173-740(2)(b)(i) and 173-340(3)(b)(iii)(B).
- For sediment, CLs based upon the Marine Sediment Management Standards (SMS), set at concentrations at which sediment quality will result in no adverse effects, including no acute or chronic adverse effects on biological resources, (WAC 173-204-320). Under the SMS, the Sediment Quality Standards (SQS) will be used as a cleanup level. In addition, where CLs are more stringent than natural background levels or the practical quantification limit (PQL), the natural background level or PQL will serve as the basis for the CL as described in WAC 173-340-720(7)(c) and WAC 173-340-740(5)(c).

These preliminary cleanup levels for uplands soil and groundwater are presented in Tables 6-1 and 6-2, respectively. Cleanup levels for sediment are presented in Table 6-3. These cleanup levels are consistent with the information previously presented to Ecology in the *Final RI/FS Work Plan* (URS, 2008) and *Preliminary Phase II RI Data Submittal* (URS, 2010a).

In the development of CLs, the following site-specific information is relevant:

- Groundwater is not currently used at the Site as a source of drinking water for beneficial uses, and due to the proximity to the North Marina, is not considered suitable as a future source of drinking water beneficial use.
- The Site is currently zoned as waterfront commercial, which allows for commercial, residential, and limited industrial use. Under the current development agreement with the City of Everett, Site use is approved for commercial and retail development. However, this does not rule out the possibility that the property could be used for residential use based on its current zoning. The Port indicated that it may seek a modification to the agreement to allow for a different mix of uses, including residential.
- Sediment cleanup levels were developed according to MTCA and SMS requirements under the two SMS criteria promulgated by Ecology (WAC 173-204-320 and -520): 1) the SQS which are set at a concentration below which effects to benthos are unlikely, and 2) the CSL which are set at concentrations above which more than minor adverse biological effects may be expected. The SQS, the more stringent SMS criteria, are used in this FS as the sediment cleanup levels for the SMS constituents detected in sediment at the Site.

Based upon the CSM and information presented to Ecology (URS, 2008; URS, 2010a), the following cleanup levels are not established for the Site:

- Groundwater: Site groundwater is not a current or reasonably likely future source of drinking water; therefore, PCLs for the protection of groundwater as a drinking water source are not established.
- Soil:
    - An empirical evaluation of groundwater and soil data collected during Phase I and II of the RI and presented in the *Preliminary Phase II RI Data Submittal* (URS, 2010a), demonstrates that hazardous substances in Site soils are protective of groundwater and marine surface water resources. Therefore, a preliminary soil cleanup level based on the protection of marine surface water resources is not established. Petroleum hydrocarbons in groundwater were only identified in exceedance of the PCL at one location during the RI. Diesel-range petroleum hydrocarbons were detected above the PCL in groundwater at SB-94 during the Phase III investigation. Soil PCLs for petroleum hydrocarbons are based on MTCA Method A-Unrestricted Land Uses, which represent concentrations below which hydrocarbon product becomes mobile (i.e., residual saturation level).

- The Site has met the conditions under MTCA demonstrating that the pathway for ecological receptors is not significant. The exclusion from further terrestrial ecological evaluation using the criteria in WAC 173-340-7491 was documented in the *Final RI/FS Work Plan* (URS, 2008) and has also been updated and presented in Appendix J of this RI/FS report. Therefore, a PCL for the protection of ecological resources is not established.
- Because of the nature of the contamination detected at the Site (insignificant concentrations of VOCs), the vapor intrusion pathway is incomplete and does not require further evaluation (WAC 173-340-740(3)(b)(C)). Therefore, a PCL for the protection of the soil to vapor intrusion pathway is not established.

6.2.2 Points of Compliance

The point(s) of compliance under MTCA are the point or points on site where the cleanup levels must be attained for each specific environmental media. The point(s) of compliance must be considered in the development and evaluation of cleanup action alternatives in the FS. This section describes the preliminary points of compliance for groundwater, soil, and sediment.

Soil

Under MTCA, the standard point of compliance for the soil cleanup levels based upon human health via direct contact is throughout the Site from the ground surface to 15 feet bgs per WAC 173-340-740(6)(d). This depth represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of Site development activities. For cleanup actions that involve containment of hazardous substances, however, the soil cleanup levels will typically not have to be met at the points of compliance if the following criteria are demonstrated as required under WAC 173-340-740(6)(f):

- The selected remedy is permanent to the maximum extent practicable using the procedures in WAC 173-340-360;
- The cleanup action is protective of human health;
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors;
- Institutional controls are put in place that prohibit or limit activities that could interfere with the long-term integrity of the containment system;
- Compliance monitoring and periodic reviews are designed to ensure the long-term integrity of the containment systems; and
- The types, levels and amount of hazardous substances remaining on site and the measures that will be used to prevent migration and contact with those substances are specified in the draft CAP.

For alternatives that contain impacted soils above cleanup levels beneath buildings or pavement, this alternative point of compliance would be met.

Groundwater

Under MTCA, the standard point of compliance for groundwater is throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially affect by the site. Because the groundwater cleanup levels presented in Table 6-1 are based on protection of marine surface water and not protection of groundwater as drinking water source, existing wells (e.g., wells MW-1, MW-4, MW-5, and MW-6) or new wells located between the upland source areas and the marine surface waters will be used to demonstrate a point of conditional compliance.

Sediment

For marine sediments potentially affected by hazardous substances, the point of compliance for protection of human health and the environment is surface sediments within the biologically active surface water habitat zone, represented by samples collected across the top 10 centimeters (cm) (i.e., 0 to 0.3 ft) below the mudline.

6.3 PRELIMINARY REMEDIATION LEVELS

Cleanup alternatives developed and evaluated in the FS include remediation levels to distinguish when various proposed cleanup action components would be implemented. For two of the upland alternatives, remediation levels would be utilized to determine when the excavation component of a cleanup action with soils impacted with PCBs is complete.

The remediation level is based upon the requirements under the MTCA and Toxic Substances Control Act (TSCA). TSCA, 40 Code of Federal Regulation (CFR) 761.61, regulates the cleanup of soils considered to contain PCB Remediation Waste as defined in 40 CFR 761.3. The TSCA regulations for unrestricted use, or “high occupancy” areas, set an unrestricted cleanup level of 1,000 µg/kg PCBs. Soils, however, can be left on site if the concentration is less than or equal to 10,000 µg/kg and a cap is installed and deed restrictions are maintained. Therefore, a remediation level of 10,000 µg/kg is established for soils impacted with PCBs and the remediation level would apply to alternatives that do not achieve the MTCA Method A cleanup level for unrestricted land use.

7.0 APPLICABLE STATE AND FEDERAL LAWS

Under WAC 173-340-710, MTCA requires that cleanup actions comply with all legally applicable state and federal laws and regulations and those requirements identified and determined to be relevant and appropriate (hereinafter “ARARs”) for the Site. This section discusses potential ARARs being considered for the selection of cleanup action alternatives.

“Applicable” requirements under MTCA are those cleanup standards, standards of control, and other human health and environmental protection requirements, criteria, or limitations adopted under state or federal law that specifically address a hazardous substance, cleanup action, location, or other circumstance at a site (WAC 173-340-200).

“Relevant and appropriate” requirements include those cleanup standards, standards of control, and other human health and environmental requirements, criteria, or limitations established under state or federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site (WAC 173-340-200). WAC 173-340-710(4) identifies the criteria to be used in determining whether a requirement is relevant and appropriate which include:

- Whether the purpose underlying the requirement is similar to the purpose of the cleanup action;
- Whether the media regulated or affected by the requirement is similar to the media contaminated or affected at the site;
- Whether the hazardous substance regulated by the requirement is similar to the hazardous substance found at the site;
- Whether the entities or interests affected or protected by the requirement are similar to the entities or interests affected by the site;
- Whether the actions or activities regulated by the requirement are similar to the cleanup action contemplated at the site;
- Whether any variance, waiver, or exemption to the requirements are available for the circumstances of the site;
- Whether the type of place regulated is similar to the site;
- Whether the type and size of structure or site regulated is similar to the type and size of structure or site affected by the release or contemplated by the cleanup action; and
- Whether any consideration of use or potential use of affected resources in the requirement is similar to the use or potential use of the resources affected by the site or contemplated cleanup action.

In accordance with WAC 173-340-710(9)(b), cleanup actions conducted under a Consent Decree (CD) or Agreed Order (AO) are exempt from the procedural requirements of certain state and local laws, including the Washington State Clean Air Act (Chapter 70.94 RCW), Washington State Solid Waste Management Act (Chapter 70.95 RCW), Washington State Hazardous Waste Management Act (Chapter 70.105 RCW), Washington State Construction Projects in Water Act (Chapter 75.20 RCW, recodified at Chapter 77.55 RCW), Washington State Water Pollution Control (Chapter 90.48 RCW) and Washington State Shoreline Management Act (Chapter 90.58 RCW), as well as any laws requiring or authorizing local government permits or approvals for the action. The cleanup action must still comply with the substantive requirements of the laws in accordance with WAC 173-340-710(9)(c). It is part of Ecology's role under a CD or AO to ensure compliance with the substantive requirements, and to provide an opportunity for comment by the public, state agencies, and local governments (WAC 173-340-170[9][d]).

Because this exemption only applies to the above-referenced list of laws and regulations, the anticipated cleanup action will need to comply with both substantive and procedural requirements associated with regulations identified in a few federal programs, such as U.S. Army Corps of Engineers (USACE) Nationwide Permit 38 (NWP 38), federal consultation under the Endangered Species Act, and the Clean Water Act (CWA) Section 401 Water Quality Certification. Other substantive requirements must still be met by the cleanup action. Ecology will be responsible for issuing the final approval for the cleanup action following consultation with other state and local regulators. The USACE will separately be responsible for issuing approval of the project under NWP 38 following Endangered Species Act consultation with the federal Natural Resource Trustees, and also incorporating Ecology's 401 Water Quality Certification.

The list of ARARs is provided in Table 7-1.

7.1 POTENTIAL CHEMICAL-SPECIFIC APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS

Chemical-specific ARARs are health-based or risk-based numerical values that specify the acceptable amount or concentration of a hazardous substance that may be found in or discharged to the ambient environment. Preliminary cleanup levels were identified as the most stringent chemical-specific ARAR for a given hazardous substance and media, the background concentration, or the analytical laboratory PQL, whichever is greater. Site indicator hazardous substances are identified as those substances that exceed a PCL.

Preliminary cleanup levels for Site indicator hazardous substances are summarized in Tables 6-1, 6-2, and 6-3. The chemical-specific ARARs which serve as the basis for these PCLs are described below.

7.1.1 Groundwater

MTCA specifies several criteria for establishing cleanup levels for groundwater under WAC 173-340-720, which to include consideration of 1) applicable state and federal laws, 2) protection of surface water beneficial uses, and 3) protection of human health. Because Site groundwater is not a current or reasonably likely future source of drinking water, PCLs for Site groundwater need not be protective of a drinking water source. Therefore, the chemical-specific ARARs considered for evaluation for the Site include only those laws and regulations based upon the protection of marine surface water beneficial uses.

Washington State Water Quality Standards for Surface Waters, WAC 173-201A-24(3) and(5), and WAC 173-201A-600. Under Section 303(c) of the CWA, states are required to designate water body uses and adopt state SWQC based on those uses. In promulgating SWQC, states are to consider national recommended water quality criteria (NRWQC) published by the USEPA under Section 304(a) of the CWA. The State of Washington has designated beneficial uses for surface water bodies of the state and established SWQC for the protection of human health and aquatic life. Port Gardner Bay adjacent to the Site has the following designated uses under WAC 173-201A-612:

- Aquatic Life -- Good quality salmonid migration and rearing; other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning
- Shell Fish harvesting
- Secondary Contact Recreation
- Miscellaneous Uses - wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

For the metals, the SWQC are based upon the dissolved-phase concentrations and calculated based upon a prescribed conversion factor (CF) identified in the regulation. In addition, under WAC 173-201A-240(4) and (5), the USEPA Quality Criteria for Water, 1986, revised shall be used in the interpretation of listed SWQC for the protection of aquatic life, and for those substances not on the listed SWQC.

For human health-based water quality criteria, the state of Washington has adopted by reference the concentrations presented in 40 CFR 131.36, known as the NTR (WAC 173-201A-240(5)).

The SWQC are a potential chemical-specific ARAR that was used in evaluating and proposing the cleanup levels presented in Table 6-1.

Federal Clean Water Act, 33 USC 1251-1376, National Recommended Water Quality Criteria 2006. The NRWQC is guidance established by the USEPA for evaluating toxic effects on human health and aquatic organisms. NRWQC have been published and updated since the early 1980s. The NRWQC evaluated as part of this FS include the NRWQC published in 2006. As described for the SWQC, for several metals, the NRWQC are based on dissolved-phase concentrations and prescribed CFs. The NRWQC are a potential chemical-specific ARAR that was used in evaluating and proposing the cleanup levels presented in Table 6-1.

National Toxics Rule, 33 USC 1251; 40 CFR 131.36(b)(1) and(d)(14); WAC 173-201A-240(5). The NTR establishes water quality criteria for toxic substances for marine aquatic life and human health. The State of Washington has adopted by reference only the human-health based criteria as referenced in 40 CFR 131.36(d)(14) (WAC 173-201A-240[5]). The NTR marine aquatic life criteria have not been adopted by the state of Washington and are not potentially applicable or relevant and appropriate. Only the human-health based standards specified in 40 CFR 131.36(d)(14) are potentially applicable to Site surface water and are potentially relevant and appropriate to hazardous substances in groundwater that are likely to reach marine surface water. The NTR are a potential chemical-specific ARAR that was used in evaluating and proposing the cleanup levels presented in Table 6-1.

7.1.2 Soil

MTCA Regulations, WAC 173-340-740(3), and 173-340-355. MTCA Method A and B cleanup levels are potentially applicable to evaluating soil cleanup standards at the site. MTCA specifies several criteria for establishing cleanup levels for soils under WAC 173-340-740 which are to include consideration of 1) applicable state and federal laws, 2) environmental protection, 3) human health protection through via groundwater, 4) human health protection via soil direct contact, and 5) soil vapor pathway for volatile organic compounds. As described below, except for the protection of human health via the soil direct contact, none of the other chemical-specific requirements apply to the Site.

No state or federal laws establish cleanup levels for site soil. The Site has met the conditions under MTCA demonstrating that the pathway for ecological receptors does not exist. The exclusion from further terrestrial ecological evaluation using the criteria in WAC 173-340-7491 was documented in the *Final RI/FS Work Plan* (URS, 2008) (WAC 173-340-7490(2)(a). In addition, because of the nature of the hazardous substances at the Site, a soil to vapor pathway is not complete and does not require further evaluation. (WAC 173-340-740(3)(b)(C)).

Regarding human health protection via groundwater, because Site groundwater is not a current or reasonably likely future source of drinking water, PCLs for Site soils based upon protection of groundwater considered only the protection of marine surface water beneficial uses. An empirical evaluation of groundwater and soil data was conducted and presented in the *Preliminary RI Phase II Data Submittal* (URS, 2010a). The empirical evaluation demonstrates that hazardous substance concentrations in Site soils are currently protective of marine surface water beneficial uses because concentrations in groundwater do not exceed preliminary groundwater cleanup levels in monitoring wells closest to the North Marina. Therefore, the only chemical specific requirements considered in developing the preliminary soil cleanup levels relate to the protection of human health direct contact. As described in Section 6, these PCLs include the MTCA Method B soil direct contact values calculated using the equations in WAC 173-340-740(3)(b)(iii)(B) and the MTCA Method A cleanup levels for unrestricted land uses presented in Table 740-1.

The preliminary cleanup alternatives evaluated in this RI/FS also include remediation levels developed in accordance with WAC 173-340-355. The remediation level identifies the maximum concentration at which PCB-affected soil would remain on site and capped (See Section 6.3). The remediation level is based upon the chemical-specific requirements specified in the below-described TSCA regulations.

Toxic Substances Control Act, 15 U.S.C. §2601 et seq. 40 CFR 761.61. The Toxic Substances Control Act (TSCA) regulates, in part, the cleanup, management and disposal of polychlorinated biphenyls (PCBs) soils (referred to as PCB remediation waste) with concentrations greater than 50,000 µg/kg. The TSCA regulations do not apply to soils with concentrations less than 50,000 µg/kg. The TSCA regulations establish requirements for self-implementing, performance-based and risk-based cleanups. Management and disposal requirements of the TSCA regulation are described in Section 7.3.3.

Under TSCA's self-implementing and risk-based cleanups PCBs are allowed to remain on site above TSCA-prescribed or site-specific risk-based cleanup levels. Under the performance-based cleanup, PCB soils must be removed to the most stringent level. Under the TSCA regulations a cleanup level of 10,000 µg/kg is established for a "high occupancy area" where a cap and deed restrictions are implemented. A "high occupancy area" is an area where an individual not wearing dermal or respiratory protection spends more than 6.7 hours per week or 16.8 hours per week in an area with non-porous surfaces. Alternatively, a cleanup level of 1,000 µg/kg is established for a "high occupancy area" for unrestricted use. This unrestricted use value is consistent with the MTCA Method A unrestricted use value for total PCBs.

As presented in Section 6, the PCL for PCBs is 1,000 µg/kg and the remediation level for cleanup action alternatives involving containment of soils is 10,000 µg/kg.

7.1.3 Marine Sediment

Under WAC 173-340-710(7)(d), the Sediment Management Standards (SMS) are utilized for the evaluation of chemical-specific ARARs and development of cleanup levels at the Site. As presented in Section 6, these chemical-specific ARARs include the two SMS criteria promulgated by Ecology (WAC 173-204-320 and -520): 1) the Sediment Quality Standards (SQS) which are set at concentrations at which sediment quality will result in no adverse effects, including no acute or chronic adverse effects on biological resources and no significant health risk to humans;, and 2) the Cleanup Screening Levels (CSL) which are set at concentrations representing minor adverse effects, the Puget Sound marine sediment minimum cleanup level to be used in evaluation of cleanup alternatives and selection of the cleanup action. As presented in Section 6.0, the SQS, the most stringent SMS screening criteria, are selected as the preliminary sediment cleanup levels for the hazardous substances detected in sediment at the Site; unless the CSL are determined more appropriate.

7.2 LOCATION-SPECIFIC ARARS

Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because the substances occur or activities are conducted in specified locations. These requirements may limit the type of remedial action that can be implemented or may impose additional constraints on remedial alternatives. Location-specific ARARs are described below.

Endangered Species Act, 16 USC 1531-1543, 50 CFR 402, 50 CFR 17. The Endangered Species Act protects fish, wildlife and plants that are threatened or endangered with extinction. It also protects habitat designated as critical to the conservation of threatened or endangered species. The Endangered Species Act requires consultation with resource agencies for projects where federal permits, licenses, or other authorities that may affect threatened or endangered species and development of a biological assessment (BA)[3] or biological opinion (BO), as needed, to demonstrate compliance. For any of the proposed marine cleanup alternatives, the potentially liable persons (PLPs) will need to consult with United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries, and Ecology to evaluate whether threatened or endangered species will be impacted. Based upon the consultation, a BA may need to be conducted. This consultation will be coordinated the USACE and coverage under the CWA Section 404 Nationwide Permit 38.

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 USC 1801 et. seq., 50 CFR Part 600. The MSFCMA was adopted to conserve and manage the fishery resources found off the coasts of the United States, and the anadromous species and Continental Shelf fishery resources of the United States, by protecting essential fish habitat. The MSFCMA requires consultation with resource agencies for projects where federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. The MSFCMA also requires development of a BA or BO, as needed, to demonstrate compliance. For any of the proposed marine cleanup alternatives, the PLPs will need to consult with United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries and Ecology to evaluate MSFCMA requirements. Based upon the consultation, a BA, in coordination with Endangered Species Act requirements, may need to be conducted. This consultation will be coordinated with the Endangered Species Act consultation and the USACE and coverage under the CWA Section 404 Nationwide Permit 38.

Fish and Wildlife Conservation Act, 16 USC 2901; 50 CFR 83. The FWCA requires federal agencies to use their authority to conserve and promote conservation of non-game fish and wildlife. Non-game fish and wildlife are defined as fish and wildlife that are not taken for food or sport, that are not endangered or threatened and that are not domesticated. Requirements of the FWCA will be evaluated in conjunction with the Endangered Species Act consultation with USFWS and NOAA Fisheries.

Federal Coastal Zone Management Act (CZMA), 16 USC 1451-1464; RCW 90.58; WAC 173-27-060, 15 CFR 923-930. The CZMA requires that federal agency action that is reasonably likely to affect use of shorelines be consistent with the approved coastal zone management plan to the maximum extent practicable, subject to limitations set forth in the CZMA. A federal agency action will occur as part of the review by USACE for coverage under the Nationwide Permit #38. Ecology reviews the proposed project for consistency with state environmental requirements, including shoreline permitting requirements. If the project is consistent, Ecology concurs with the certification in writing. For the proposed marine cleanup alternatives, Coastal Zone Consistency requirements will be met.

Archaeological and Historic Preservation Act, 16 USC 469. This act establishes procedures to provide for the preservation of historical and archeological data that might

[3] A Biological Assessment (BA) or Biological Evaluation (BE) is prepared and submitted by the Federal Agency (e.g., Corps) to the Services when requesting consultation. The BE or BA is the consultation document. A letter of concurrence is prepared by the Service if the Service concurs with a determination of "not likely to adversely affect" a listed species. A biological opinion is prepared if adverse effects area is anticipated to occur.

be destroyed through alteration of terrain as a result of a federally licensed activity or program. Although the marine environment consists of sediments which have been disturbed through continual maintenance dredging, and the upland areas consist of fill, this regulation will be considered during implementation of the cleanup action. Appropriate measures will be taken during excavation activities and appropriate tribal members will be contacted in the event that an artifact is encountered.

Archaeological Resources Protection Act, 16 USC 470aa; 43 CFR 7. This act and regulations specify the steps that must be taken to protect archaeological resources and sites that are on public and Native American lands and to preserve data uncovered. Although the marine environment consists of sediments which have been disturbed through continual maintenance dredging, and the upland areas consist of fill, this regulation will be considered during implementation of the cleanup action. Appropriate measures will be taken during excavation activities and appropriate tribal members will be contacted in the event that an artifact is encountered.

7.3 ACTION-SPECIFIC ARARS

Potential action-specific ARARs are typically technology- or activity-based requirements or restrictions on actions taken with respect to hazardous substances. These potential requirements are triggered by the particular cleanup action alternative and set performance, design or other standards that will be used to implement the proposed remedial action. Action-specific ARARs are described below.

7.3.1 In-Water Work

Clean Water Act, Section 404 - Dredge or Fill Requirements Regulations, 33 USC 1344(a)–(d), 33 CFR Parts 320-330, 40 CFR 230. Section 404 of the CWA requires a permit for the discharge of dredged or fill material into waters of the United States, including filling or construction activities in navigable waters and wetlands. These requirements are applicable to in-water dredging, filling, and/or capping proposed for the marine cleanup alternatives. For these alternatives, the requirements of these regulations will be met by obtaining coverage under an USACE NWP No. 38. NWP No. 38 applies to the “Cleanup of Hazardous and Toxic Waste” and covers “specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority.” To obtain coverage, the PLP will either complete a Joint Aquatic Resource Permit Application or submit a letter along a project description and plans. Consultation with other agencies as identified in the location- and other-action specific ARARs will be conducted concurrent with USACE’s review of NWP No. 38 coverage.

Clean Water Act, Section 401, Water Quality Certification, 33 USC 1340, WAC 173-225-010. Section 401 of the Federal Water Pollution Control Act provides that applicants for a license or permit from the federal government relating to any activity which may result in any discharge into the navigable waters shall obtain a certification from the state that the water quality standards will be met. These requirements are applicable to in-water dredging, filling, and/or capping proposed for the marine cleanup alternatives and is coordinated between the USACE and Ecology through application for coverage under

NWP No. 38. To obtain certification, the PLPs will request review by Ecology as part of the NWP No. 38 process. Consultation with other agencies as identified in the location- and other-action specific ARARs will be conducted concurrent with Ecology's review of the CWA Section 401 water quality certification.

Temporary Modification of Water Quality Criteria and Other Requirements to Modify Water Quality Criteria, RCW 90.48; WAC 173-201A-410 through –450. Chapters 173-201A-400 through -450 specify requirements for modifying SWQC on a site-specific basis. These requirements include establishment of short-term water quality modification, variance, site-specific water criteria, and water quality offsets. Construction activity in or adjacent to surface waters that will unavoidably cause violations of the Washington SWQC may obtain a Short-term Water Quality Modification. This requirement is potentially applicable to the dredging, filling, capping, and/or construction in, or adjacent to the Port Gardner Bay.

Washington Hydraulics Project Approval, Chapter 75.55.061 RCW, Chapter 220-110 WAC. Hydraulic Project Approval and associated requirements for construction projects in state waters have been established for the protection of fish and shellfish. Any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state, requires a Hydraulic Project Approval from the Washington Department of Fish and Wildlife (WDFW). These requirements are applicable to in-water dredging, filling, and/or capping proposed for the marine cleanup alternatives. Because activities would occur on site as part of a MTCA cleanup action, no permit would be required and only substantive compliance with this ARAR would be required. The substantive requirements are potentially applicable to work which occurs below the high water mark and includes restrictions on dates of in-water work (in-water windows) used to protect fish species at critical life history stages (e.g., spawning season for salmonids). For the marine cleanup action alternatives, the in-water work windows will be met during performance of the cleanup action. Compliance with substantive requirement will be determined in consultation with WDFW and would include meeting technical provisions and timing restrictions.

7.3.2 Stormwater Management

Stormwater Permit Program, RCW 90.48.260; 40 CFR 122.26; Chapter 173-226 WAC. The Federal Clean Water Act (CWA), as delegated to Ecology under RCW 90.48.260, requires that coverage under the general stormwater permit must be obtained for stormwater discharges associated with construction activities disturbing over 1 acre. The disturbed area for this project is expected to be greater than 1 acre. To meet this requirement, the Project will obtain coverage under the Washington State General Stormwater Permit for Construction Activities. In addition, a stormwater pollution prevention plan (SWPPP) will be prepared before start of land disturbing activities, which will describe the best management practices (BMPs) that will be implemented to protect surface water quality. These requirements would be coordinated with any applicable local grading and erosion control.

7.3.3 Management of Wastes

Washington Solid Waste Management Act and Solid Waste Management Handling Standards Regulations, Chapter 70.95 RCW, Chapter 173-350 WAC. The solid waste requirements are potentially applicable to the off site disposal of solid nonhazardous wastes and contaminated media that may be generated as part of the shoreline repair activities. For off site disposal activities related to the upland and marine cleanup action alternatives, these requirements will be complied with to the fullest extent. Waste materials will be sent to facilities licensed and permitted to accept the specific waste material and documentation will be obtained of such disposition.

Resource Conservation and Recovery Act, 42 USC 6901 ; Dangerous Waste Act and Regulation, RCW 70.105; Chapter 173-303 WAC, Select provisions. Washington State has been authorized to implement portions of the Hazardous and Solid Waste Amendment and non-Hazardous and Solid Waste Amendment provisions of the Resource Conservation and Recovery Act (RCRA). In some instances, Washington State's authorized program is more stringent than the federal RCRA program.

Current analytical results indicate that soils would not designate as a hazardous waste. Cleanup action alternatives, involving active management, treatment and disposition of soils or other waste materials from alternatives which consider building demolition will consider the applicability of the dangerous waste regulations. The potential applicability of these requirements is triggered only when the materials are actively managed; for instance, soils are excavated and located to a different area of the Site. The following are potentially applicable requirements that may need to be considered during the remedial design for the selected remedial alternative.

- *Dangerous Waste Designation.* Under WAC 173-303-170, the Dangerous Waste regulations specify requirements for generators to follow including responsibility for designating dangerous and extremely hazardous waste, and an allowance for treating dangerous waste in tanks or containers without triggering permit requirements.

The following dangerous waste requirements are not ARARs for Site activities but may be applicable if dangerous or hazardous waste is transported off site:

- Notification numbers for generator, transporter and disposal facilities under WAC 173-303-060.
- Land disposal restrictions under WAC 173-303-140.
- Treatment, storage and disposal of dangerous waste under WAC 173-303-141.
- Manifest for off site transport of dangerous waste under WAC 173-303-180.
- Preparation of waste for shipment, including labeling, marking, packaging, placarding under WAC 173-303-190.
- Generator record keeping and reporting under WAC 173-303-210 and –220.
- Dangerous waste transportation off site under WAC 173-303-240.

Toxic Substances Control Act, 15 U.S.C. §2601 et seq. 40 CFR 761.61. As described in Section 7.1.2, the TSCA regulates, in part, the cleanup, management and disposal of PCBs. These regulations apply to sites with soils impacted with PCBs greater than 50,000 µg/kg. In addition to establishing cleanup levels, the action-specific applicable TSCA regulations establish requirements for management, transportation and disposal of soils impacted with PCBs. Soils with concentrations greater than 50,000 µg/kg will be disposed of at a properly licensed facility under 40 CFR 761.61 which includes many RCRA Subtitle C facilities. Soils greater than and equal to 1,000 µg/kg and less than or equal to 50,000 µg/kg will be disposed of at a properly licensed facility, permitted to accept such soils.

For alternatives that include capping of soil containing PCBs at concentrations greater than 1,000 µg/kg, the cap must be constructed and maintained in accordance with 40 CFR 761.61. In addition, a deed restriction meeting the requirements of 40 CFR 761.61 must be recorded and maintained. Because land use at the Site is considered "high occupancy", total PCBs concentrations greater than 10,000 µg/kg will not be contained under a cap on-site, but disposed of at a properly licensed facility, permitted to accept such soils.

The following TSCA requirements are not ARARs for Site activities but would be applicable if soils with concentrations greater than 50,000 µg/kg are transported off-site:

- Notification numbers for generator, transporter and disposal facilities under WAC 40 CFR 761.202 - .205.
- Manifest for off site transport of dangerous waste under 40 CFR 761.207 through .215.
- Certification of Disposal under 40 CFR 761.218.

Minimum Standards for Construction and Maintenance of Water Wells, Chapter 18.104 RCW; WAC 173-160-101, -121, -161 to –241, -261 to –341, -381. Well construction regulations establish minimum standards for water well construction. This regulation is potentially applicable to wells constructed for groundwater withdrawal and monitoring. This regulation is also potentially applicable to decommissioning of existing or future wells.

Regulation and Licensing of Well Contractors and Operators, Chapter 18.104 RCW; WAC 173-162-020, -030. These regulations apply to all water well contractors and operators who are providing well installation, maintenance, or abandonment services in Washington State. These regulations are potentially applicable to any well contractor or operator who installs wells at the Site.

General Regulations for Air Contaminant Source, Chapter 70.94 RCW; WAC 173-400-040(8); Puget Sound Clean Air Agency (PSCAA) Regulation 1, Section 9.15. The Washington Clean Air regulations require that owners and operators of fugitive dust source take reasonable precautions to prevent fugitive dust from becoming airborne and to maintain and operate the source to minimize emissions. PSCAA regulations identify specific requirements related to the control of fugitive dust, including the requirement to employ reasonable precautions to minimize the emissions. Reasonable precautions include, but are not limited to, the following: 1) the use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds; 2) surfacing roadways and parking areas with asphalt, concrete, or gravel; 3) treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or 4) covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials. For cleanup action alternatives which could result in fugitive dust emissions, fugitive dust emissions will be minimized per the Washington State and PSCAA requirements.

7.3.4 Local Requirements

Washington State Shoreline Management Act and City of Everett Shoreline Master Program (SMP), RCW 90.58, WAC 173-27-060, City of Everett Ordinance 3053-08 and SMP. The Shoreline Management Act and City of Everett SMP require a permit for any development or activity valued at $5,000 or as adjusted by inflation by the state legislature or where exempt under RCW 90.58.030(3)(e). Shorelines are defined as lakes, including reservoirs, of 20 acres or greater; streams with a mean annual flow of 20 cubic feet per second or greater; marine waters plus an area landward for 200 feet measured on a horizontal plane from the ordinary high water mark; and all associated marshes, bogs, swamps, and river deltas.

Cleanup actions under MTCA are exempt from shoreline management act permitting under MTCA and WAC 173-37-040(3). For upland cleanup action alternatives that include activities within 200 feet of the shoreline and marine cleanup action alternatives, this requirement will meet the substantive requirements. To meet the substantive requirements, the PLPs will consult with the City of Everett.

City of Everett Stormwater and Storm Drainage, Ordinance 2196-96, amending Title 14.28, Effective February 15, 2010; City of Everett Stormwater Management Manual, dated February 2010. The City of Everett Ordinance specifies requirements for the management of stormwater and development of storm drainage systems for new and redeveloped properties. These requirements include meeting Minimum Technical Standards, which may include some or all of the following based upon the size of the addition of the impervious surface: Erosion and Sediment Control for all sized projects, for projects adding greater than 5,000 SF of impervious surface: 1) development of a Stormwater Site Plan, Construction Stormwater Pollution Prevention Plan Large Parcel Erosion and Sediment Control Plan and Drainage Plan; 2) apply erosion and sediment controls; 3) preserve natural drainage; 4) apply source control BMPs; 5) apply runoff treatment BMPs where the project creates 5,000 SF or more of net additional pavement; treatment BMPs shall be sized to capture and treat a 6-month, 24-hour return period storm; 6) off site analysis and mitigation; and 7) operation and maintenance. The applicability of the substantive requirements of the stormwater and storm drainage ordinance, which were recently amended, will be determined through consultation with the City of Everett during the design phase of the selected cleanup action and any substantive requirements will be incorporated into the design documents.

City of Everett Grading Code, Title 18.28.200 EMC. Title 18.28 EMC, Land Division Evaluation Criteria and Development Standards, requires a grading plan to be submitted to the city engineer "before any site modification where existing natural features would be disturbed or removed." [18.28.200(A)]. The EMC establishes minimum standards for clearing and grading, generally based on following "sound engineering techniques." The EMC states, in relationship to environmentally sensitive areas, that "Clearing and grading limits shall be established so as to not impact environmentally sensitive areas, the required buffers, and adjacent properties," [18.28.200(E)(4)] and that "on projects that have environmentally sensitive features and in critical drainage areas, clearing and grading and other significant earth work may be limited to a specific time period as determined by the city." [18.28.200(F)]. The applicability of the substantive requirements of the grading code will be determined through consultation with the City of Everett during the design phase of the selected cleanup action and any substantive requirements will be incorporated into the design documents.

City of Everett Traffic Code, Title 46 EMC. Construction activities such as haul truck operations may require that traffic be directed by flaggers and signage. The applicability of the substantive requirements of the grading code will be determined through consultation with the City of Everett during the design phase of the selected cleanup action and any substantive requirements will be incorporated into the design documents.

City of Everett Discharge to POTW Title 14.40 EMC. Dewatering activities associated with the cleanup action alternatives involving hydraulic dredging will require a wastewater discharge permit to discharge water to the POTW. The applicability of the substantive requirements of the Title 14.40 EMC will be determined through consultation with the City of Everett during the design phase of the selected cleanup action and any substantive requirements will be incorporated into the design documents.

7.4 STATE ENVIRONMENTAL POLICY ACT

The State Environmental Policy Act (SEPA) (Chapter 43.21C RCW; Chapter 197-11WAC) and the SEPA procedures (Chapter 173-802 WAC) This state law is intended to ensure that state and local government officials consider environmental values when making decisions or taking an official action such as approving the CAP. The SEPA process will be coordinated by Ecology as part of the MTCA review process. The SEPA process will begin with the inclusion of a SEPA checklist along with the draft CAP that will undergo public review. It is expected that a Determination of Nonsignificance will be issued for the implementation of the selected cleanup action.

8.0 MTCA AND SMS EVALUATION CRITERIA

This section presents a description of the minimum requirements and procedures for selection of cleanup action alternatives under MTCA and SMS. Those requirements are:

- Threshold requirements, and
- Other requirements.

8.1 THRESHOLD REQUIREMENTS

Cleanup actions performed under MTCA must comply with several basic requirements. Cleanup actions alternatives that do not comply with these criteria are not considered suitable cleanup actions under MTCA. As provided in WAC 173-340-360(2)(a), the four threshold requirements for cleanup actions are that they must:

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring.

8.1.1 Protection of Human Health and the Environment

The results of cleanup actions performed under MTCA must ensure that both human health and the environment are protected by eliminating, reducing or otherwise controlling risks posed through each exposure pathway and migration route.

8.1.2 Compliance with Cleanup Standards

Compliance with cleanup standards requires that cleanup levels are met at the applicable points of compliance. A conditional point of compliance for this Site will be established for groundwater at existing or new wells located between surface water and upgradient source areas. For some upland cleanup action alternatives involving containment of hazardous substances, the points of compliance for soil will be established beneath buildings or other containment structures in accordance with the criteria specified in WAC 173-340-740(6)(f) as presented in Section 6.2.2. Preliminary cleanup levels and points of compliance are proposed in Section 6.0 of this report.

8.1.3 Compliance with Applicable State and Federal Laws

Cleanup actions conducted under MTCA must comply with applicable state and federal laws. The term "applicable state and federal laws" includes legally applicable requirements and those requirements that Ecology determines to be relevant and appropriate as described in WAC 173-340-710. ARARs are presented in Section 7 of this report.

8.1.4 Provision for Compliance Monitoring

The cleanup action must provide for compliance monitoring in accordance with WAC 173-340-410. Compliance monitoring consists of protection monitoring, performance monitoring, and confirmational monitoring. Protection monitoring is conducted to confirm that human health and the environment are adequately protected during construction and the operation and maintenance period of a cleanup action. Performance monitoring is conducted to confirm that the cleanup action has attained cleanup standards and, if appropriate, remediation levels or other performance standards. Confirmational monitoring is conducted to confirm the long-term effectiveness of the cleanup action once cleanup standards and, if appropriate, remediation levels or other performance standards have been attained.

8.2 OTHER MTCA REQUIREMENTS

Under MTCA, when selecting from the alternatives that meet the minimum requirements described above, the alternatives shall be further evaluated against the following additional criteria:

- Use permanent solutions to the maximum extent practicable using a "disproportionate cost analysis" (DCA)
- Provide for a reasonable restoration timeframe
- Consider public concerns

8.2.1 Use of Permanent Solutions to the Maximum Extent Practicable

MTCA requires that when selecting from cleanup action alternatives that fulfill the threshold requirements, the selected action shall use permanent solutions to the maximum extent practicable per WAC 173-340-360(2)(b)(i) and (3). "Permanent solution" or "permanent cleanup action" means a cleanup action in which cleanup standards of WAC 173-340-700 through 173-340-760 can be met without further action being required at the site being cleaned up or any other site involved with the cleanup action, other than the approved disposal of any residues from the treatment of hazardous substances as defined in (WAC 173-340-200). "Practicable" means capable of being designed, constructed and implemented in a reliable and effective manner including consideration of cost. When considering cost under this analysis an alternative shall not be considered practicable if the incremental costs of the alternative are disproportionate to the incremental degree of benefits provided by the alternative over other lower cost alternatives.

MTCA specifies that the permanence of these qualifying alternatives shall be evaluated by balancing the costs and benefits of each of the alternatives using a DCA in accordance with WAC 173-340-460(3)(e). Seven evaluation criteria for conducting the DCA are described in Section 8.3 per WAC 173-340-360(3)(f), and the DCA for the Site cleanup alternatives is presented in Section 10.

8.2.2 Provision for Reasonable Restoration Time

In accordance with WAC 173-340-360(2)(b)(ii), MTCA specifies the requirements for evaluating whether a cleanup action at a site provides for a reasonable restoration timeframe (WAC 173-340-360(4)(b)). These factors include:

- Potential risks posed by the site to human health and the environment,
- Practicability of achieving a shorter restoration timeframe,

- Current use of the site, surrounding areas, and associated resources that are, or may be, affected by releases from the site,
- Potential future uses of the site, surrounding areas, and associated resources that are, or may be, affected by releases from the site,
- Availability of alternative water supplies,
- Likely effectiveness and reliability of institutional controls,
- Ability to control and monitor migration of hazardous substances from the site,
- Toxicity of the hazardous substances at the site,
- Natural processes that reduce concentrations of hazardous substances and have been documented to occur at the site or under similar site conditions.

8.2.3 Consideration of Public Concerns

Public participation and consideration of public concern is an integral part of the Site cleanup process under MTCA. A draft of this RI/FS report was issued for public comment and the comments were considered prior to finalizing this report. A similar process will occur for the draft Cleanup Action Plan, prior to selection of the final cleanup action, as specified in WAC 173-340-380.

8.3 DISPROPORTIONATE COST ANALYSIS

The MTCA DCA is used to evaluate which of the alternatives that meet the threshold requirements are permanent to the maximum extent practicable. This analysis involves comparing the costs and benefits of alternatives and selecting the alternative whose incremental costs are not disproportionate to the incremental benefits. The evaluation criteria for the disproportionate cost analysis are specified in WAC 173-340-360(3)(f), and include:

- Overall protectiveness, including the degree to which existing risks are reduced, time required to reduce risk and attain cleanup standards, and improvement of the overall environmental quality;
- Permanence, including the degree to which the alternative permanently reduces the toxicity, mobility or volume of hazardous substances;
- Long-term effectiveness, including the degree of certainty that the alternative will be successful, the reliability during the period of time hazardous substances are expected to remain on-site above cleanup levels, the magnitude of residual risk, and the effectiveness of controls;
- Management of short-term risks, including risks to human health and the environment during construction and implementation, and the effectiveness of measure to manage such risks;
- Technical and administrative implementability, including consideration of whether alternative is technically possible, availability of necessary off site facilities, services and materials, administrative and regulatory requirements,

scheduling, size, complexity, monitoring, access, and integration with existing facility operations and other current or potential remedial actions;

- Public concerns, including whether the public has concerns and the extent to which the alternative addresses those concerns; and
- Cost, including cost of construction, the present worth of any long-term costs, recoverable agency oversight costs, monitoring, equipment replacement, and institutional controls.

As outlined in WAC 173-340-360(3)(e), MTCA provides a methodology that uses the criteria described in subsections 8.3.1 through 8.3.6 to assess whether the costs associated with each cleanup alternative are disproportionate relative to the incremental benefit of each alternative as compared to the next lowest-cost alternative. The comparison of benefits relative to costs may be quantitative, but will often be qualitative and require the use of best professional judgment. When possible for this FS, quantitative factors such as mass of contaminant removed or percentage of area of impacts remaining were compared to costs for the alternatives evaluated, but many of the benefits associated with the criteria described below were necessarily evaluated qualitatively. As specified in WAC 173-340-360(3)(e)(ii)(C), Ecology has the discretion to favor or disfavor qualitative benefits and use that information in selecting of a cleanup action.

In order to favor the benefits represented by particular criteria associated with the primary goals of the remedial action, this RI/FS report uses a weighting system[4] accepted once by Ecology. The first three criteria associated with environmentally-based benefits are more highly weighted than the other three criteria that are associated with non-environmental factors. Costs are disproportionate to benefits if the incremental costs of the more permanent alternative exceed the incremental degree of benefits achieved by the other lower-cost alternative (WAC 173-340-360(e)(i)). Where two or more alternatives are equal in benefits, Ecology selects the less costly alternative (WAC 173-340-360(e)(ii)(C)). Each of the MTCA criteria used in the DCA is described below.

8.3.1 Protectiveness: weighting factor of 30%

The overall protectiveness of a cleanup action alternative is evaluated based on several factors, including the degree to which existing risks are reduced, time required to reduce risk at the facility and attain cleanup standards, on site and off site risks resulting from implementing the alternative, and improvement of the overall environmental quality. This RI/FS report uses a weighting factor of 30 percent for the protectiveness criterion. This means that, despite being only one of 6 factors (17%) for which a numeric value is assigned, the numeric factor assigned to protectiveness for each alternative is up-weighted to represent 30% of the numeric benefit analysis. This high weighting is warranted because of the overall importance of protection of human health and the environment as a primary goal of cleanup at the Site.

8.3.2 Permanence: weighting factor of 20%

The overall permanence of the cleanup action must be considered in the disproportionate cost analysis. Evaluation criteria include the degree to which the alternative permanently

[4] Refer to http://www.ecy.wa.gov/programs/tcp/sites/whatcom/ww_archive.htm

reduces the toxicity, mobility or mass of hazardous substances, including the effectiveness of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of waste treatment processes, and the characteristics and quantity of treatment residuals generated. A weighing factor of 20 percent was assigned to the numeric values associated with this evaluation criterion. This criterion has the second highest weighting factor.

8.3.3 Effectiveness over the Long Term: weighting factor of 20%

Long-term effectiveness includes the degree of certainty that the alternative will be successful, the reliability of the alternative during the period of time hazardous substances are expected to remain on site at concentrations that exceed cleanup levels, the magnitude of residual risk with the alternative in place, and the effectiveness of controls required to manage treatment residues or remaining wastes. The MTCA regulations specify a guide for ranking cleanup action components in descending order: reuse/recycling, destruction or detoxification, immobilization or solidification, on site or off site disposal in an engineered, lined and monitored facility, on site isolation or containment with attending engineering controls, and institutional controls and monitoring. The MTCA preference ranking must be considered along with other site-specific factors in the evaluation of long-term effectiveness. A weighting factor of 20-percent was assigned to the long-term effectiveness criterion.

8.3.4 Management of Short-Term Risks: weighting factor of 10%

The short-term risks criteria evaluates the risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of the measure that will be taken to manage such risks. Examples of risks include potential exposure to hazardous substances during implementation of the selected remedy or general construction hazards. A weighting factor of 10 percent was assigned to this criterion. This lower rating is based on the limited time-frame associated with the risks and the general ability to correct short-term risks during construction without significant effect on human health and the environment.

8.3.5 Technical and Administrative Implementability: weighting factor of 10%

Implementability is an overall metric expressing the relative difficulty and uncertainty of implementing the cleanup action. Evaluation of implementability includes consideration of technical factors such as the availability of mature technologies and experienced contractors to accomplish the cleanup work. It also includes administrative factors associated with permitting and completing the cleanup. The weighting factor that was assigned to the implementability criterion was 10 percent. Implementability is less associated with the primary goal of the cleanup action, protection of human health and the environment, and therefore has a lower weighting factor than criteria with greater environmental benefit. In addition, the issues associated with the implementability of a remedy are often related to the level of effort to perform the cleanup action.

8.3.6 Consideration of Public Concerns: weighting factor of 10%

Public concerns were evaluated following receipt of comments from the public on the draft RI/FS Report. The weighting factor that was assigned to the public concern criterion was 10 percent.

8.3.7 Cost

No weighting factor is applied to this quantitative category, as costs are compared against the numeric analysis. The analysis of cleanup action alternative costs under MTCA includes all costs associated with implementing an alternative, including design, construction, long-term monitoring, and institutional controls. Costs are intended to be comparable among different alternatives to assist in the overall analysis of relative costs and benefits of the alternatives. The costs to implement an alternative include the cost of construction, the net present worth of any long-term costs, and agency oversight costs. Long-term costs include operation and maintenance costs, monitoring costs, equipment replacement costs, and the cost of maintaining institutional controls. Cost estimates for treatment technologies describe pretreatment, analytical, labor, and waste management costs. The design life of the cleanup action is estimated, and the costs of replacement or repair of major elements are included in the cost estimate. Costs are compared against benefits to assess cost-effectiveness and practicability of the cleanup action alternatives.

8.4 ADDITIONAL SMS EVALUATION CRITERIA

Remedy selection criteria under SMS regulations are generally the same as those required under MTCA. The SMS evaluation criteria are specified in WAC 173-204-560(4)(f) through (k), and include the following:

- Overall protection of human health and the environment;
- Attainment of cleanup standards;
- Compliance with applicable state, federal, and local laws;
- Short-term effectiveness;
- Long-term effectiveness;
- Ability to be implemented;
- Cost;
- The degree to which community concerns are addressed;
- The degree to which recycling, reuse, and waste minimization are employed; and
- Analysis of environmental impacts consistent with SEPA requirements.

Requirements under SMS for cleanup decisions are specified in WAC 173-204-580(2) through (4). This portion of the regulation specifies factors that are to be considered by Ecology in making its cleanup decision. Most of these requirements overlap with the cleanup decision requirements under MTCA. SMS cleanup decision requirements include the following:

- Achieve protection of human health and the environment;

- Comply with applicable state, federal, and local laws;
- Comply with site cleanup standards;
- Achieve compliance with sediment source control requirements;
- Provide for landowner review of the cleanup study and consider public concerns raised during review of the draft cleanup report;
- Provide adequate monitoring to ensure the effectiveness of the cleanup action;
- Provide a reasonable restoration time frame;
- Consider the net environmental effects of the alternatives;
- Consider the relative cost-effectiveness of the alternatives in achieving the approved site cleanup standards; and
- Consider the technical effectiveness and reliability of the alternatives.

Like MTCA, the SMS regulations include a requirement for a reasonable restoration time frame. However, SMS includes a preference for restoration time frames that are less than ten years [WAC 173- 204-580(3)]. Longer restoration time frames may be authorized, but only where it is not practicable to accomplish the cleanup action within a ten-year period.

Of the SMS evaluation criteria listed above, all but two are addressed as part of the MTCA evaluation of alternatives presented in this FS. The two exceptions are: 1) the completion of a SEPA analysis of environmental impacts[5], and 2) consideration of the net environmental effects of the alternatives. These criteria will be addressed during the development of the draft CAP.

8.5 CURRENT AND FUTURE LAND USE AND SITE USE

The final cleanup action must be compatible with current land use and site use and expected planned future land use and site use. As such, the final cleanup action is a "permanent solution to the maximum extent practicable" by achieving cleanup standards in a reliable and effective manner while considering seven criteria specified in Section 8.3. Below is a summary of the current and future land use and reasonably expected future land use and site use.

The Site is currently developed with buildings and other structures as described in Section 2.0. Structures within the Lease Area are currently vacant. Portions of the Lease Area, including most of the unpaved portions, are enclosed within a chain-link fence to prevent unauthorized access. The upland portion of the Site beyond the Lease Area boundary is covered by buildings or pavement. The in-water portion of the Site includes the inactive marine railway, several docks and the Port's Travel Lift.

The City of Everett zoning map (City of Everett, 2008) identifies the zoning of the Site as Waterfront Commercial which allows for commercial, residential, and limited industrial use. Industrial use is limited to research/testing labs (zoning does not allow for mass

[5] SEPA has specific requirements pertaining to the implementation of the MTCA per WAC 173-240-130(8).

production or manufacturing of goods), which does not fit within MTCA's characteristics of Industrial Land Use.

The Site is located within the planned Port Gardner Wharf redevelopment. The Port Gardner Wharf development is a planned mixed use development that will include residential in areas outside the Site, commercial, and potentially light industrial uses. The Port Gardner Wharf development has been subjected to public review, including public review of an environmental impact statement (EIS) under SEPA.

The Port has prepared a preliminary redevelopment plan and has a development agreement with the City of Everett that states the Site will be used for commercial and public access uses which could include commercial development such as professional office space and retail shopping. The Port may seek a modification to the agreement to allow for a different mix of uses, including possibly residential. Redevelopment plans also include reconfiguring docks in the North Marina, replacement of several bulkheads, and removal of the Port's Travel Lift.

Although redevelopment of the Site would include covering a large portion of the Site with buildings or pavement, opportunities for green/low impact development will be looked at including the incorporation of additional landscaped areas where possible to help minimize the amount of stormwater runoff that would need to be managed. Future use of the Site for heavy industrial purposes is not anticipated at this time, and would not be allowed under the current zoning code. The timing for redevelopment is uncertain.

Regardless of the specific use (residential, commercial, light industrial), it is anticipated that all existing buildings and other structures will be removed from the Site and new infrastructure will be constructed, including roadways and utilities. Sub-grade parking may be constructed to service new structures, depending on building density.

9.0 DEVELOPMENT OF CLEANUP ALTERNATIVES

This section summarizes the environmental media requiring cleanup and discusses potential cleanup action technologies and cleanup action alternatives for upland soils and marine sediments. The identified cleanup action alternatives are further evaluated in Section 10, in accordance with Ecology's requirements for a cleanup action under the MTCA Cleanup Regulation and SMS standards. The preferred cleanup action alternatives for upland soils and marine sediments are identified in Section 11.0.

When appropriate, MTCA allows for an initial screening of cleanup action alternatives such that the number of alternatives carried forward to the detailed analysis is reduced. MTCA stipulates that the following cleanup action alternatives or components may be eliminated from further consideration in a Feasibility Study:

- Alternatives or components that clearly do not meet the minimum requirements established for cleanup actions under WAC 173-340-360, including those alternatives for which costs are clearly disproportionate.
- Alternatives or components which are not technically possible.

For the purpose of the initial screening process, Tables 9-1 and 9-2 summarize potential general response actions for upland soils and marine sediments, respectively. The response actions identified in these tables are screened for applicability to the Site, and are either retained or rejected from further evaluation. As indicated in Table 9-1, retained response actions for upland soils include:

- Institutional controls and long-term monitoring;
- Removal (excavation) and off-site disposal; and
- Containment with an engineered cap.

Of these potential response actions, institutional controls and containment would only be considered as components of a cleanup action alternative that would also include soil removal and off-site disposal. Similar to the upland soil cleanup action alternatives, the marine sediment cleanup action alternatives would include dredging and disposal as at least a component to all of the cleanup action alternatives.

The no action and natural attenuation response actions were rejected in Table 9-1 for upland soils since they are clearly not expected to meet the minimum MTCA threshold requirements per WAC 173-340-360. Other response actions in Table 9-1 were rejected because they are either clearly not applicable to contaminants of concern (e.g., in situ treatment) or the affected media (e.g., hydraulic controls), or clearly are not suitable to existing or reasonably foreseeable future land uses at the Site. Soil stabilization was also rejected as a potential containment cleanup action technology because stabilization is generally not applicable to contaminants of concern at the Site and would also not be expected to be compatible with potential future site redevelopment.

As shown on Table 9-2, the retained general response actions for marine sediments include:

- Institutional controls and long-term monitoring,
- Monitored natural recovery,
- Dredging and off-site disposal,
- In-situ treatment, and
- Containment with a cap.

As indicated above, institutional controls and long-term monitoring, natural recovery, and removal/disposal response actions were retained in Table 9-2 for marine sediments. Other response actions are not applicable to the indicator hazardous substances at the Site.

Key decisions relevant to the retained response actions relate to the relative degree to which cleanup standards are achieved through removal and off-site disposal, versus various combinations of removal and capping alternatives. Given Ecology's preference for removal over capping (see Section 8.3.4), all of the cleanup action alternatives presented in this RI/FS report include excavation of upland soils and dredging of marine sediments at least as a significant component of the cleanup action alternatives. Institutional controls and long-term compliance monitoring would be required for an alternative that relies on containment technology to ensure long-term protectiveness.

MTCA establishes a preference for cleanup actions that are permanent to the maximum extent practicable. For this Site, the most permanent alternative would include complete removal of upland soils and marine sediments with hazardous substances above PCLs. This alternative is practically available at this point except for the eastern upland portion of the Site which was recently capped through installation of the City's 17-foot wide concrete sidewalk. Therefore, other alternatives must be considered for this very limited upland portion of the Site. Remedies that rely on containment, institutional controls, and long-term compliance monitoring are evaluated against the complete soil removal alternative using a DCA, as discussed in Section 10.0.

9.1 ENVIRONMENTAL MEDIA REQUIRING CLEANUP

The environmental media requiring cleanup based on the RI data and the PCLs are discussed by medium in subsections 9.1.1 through 9.1.3.

9.1.1 Upland Soil

Figure 4-5a shows the areal extent where soil contaminant concentrations exceed the PCLs (see Section 6.2). A total of approximately 18,800 CY of soil exceed the PCLs at the site. This estimated volume includes 240 CY of soils with concentrations equal to or greater than 50,000 µg/kg PCBs that would be disposed of as TSCA remediation waste, based on an estimated excavation depth of 4 feet bgs within a limited area. The remaining soil (approximately 18,600 CY) would be expected to be classified as a non-hazardous environmental media. This volume of non-hazardous soil is based on an average depth of 3 feet bgs, except in the bulkhead area where a depth of 14 feet bgs was assumed. A swell factor of 25 percent was assumed in this volume estimate for soil to account for the increase in the volume when soil is excavated. As illustrated on Figure 4-

5a, the major areas at the Site where soil contamination exceeds PCLs within the Lease Area include:

- 17,000 SF beneath existing buildings with asphalt or concrete floors
- 3,000 SF beneath existing buildings with wooden floors
- 33,000 SF beneath outside paved surfaces
- 58,000 SF beneath outside unpaved surfaces

The estimated areal extent of upland soils exceeding PCLs beyond the Lease Area is approximately 21,000 SF. This area includes:

- Asphalt paved surfaces located beneath and adjacent to the marine railway between the Lease Area and the marina;
- Asphalt paved surfaces located southeast of the Port's Travel Lift investigated during Phase III study;
- An area beneath the former Fish Processing Building;
- Asphalt paved areas located south and west of the former Fish Processing Building;
- A paved area southwest of the Lease Area; and
- An area beneath the recently constructed sidewalk in the northeast portion of the Site.

As described in Section 5.0, in the area southeast of the Port's Travel lift, suspected sources of petroleum hydrocarbons include the former crane and the suspected USTs identified during the Phase III Geophysical Survey. The former crane and suspected USTs are located outside the Lease Area boundary.

9.1.2 Groundwater

Arsenic was the only indicator hazardous substance detected in groundwater that consistently exceeded the preliminary groundwater PCLs during a year-long groundwater monitoring program conducted during the RI. Dissolved arsenic was consistently detected (i.e., detected in four consecutive quarters) in samples collected at well MW-4 at concentrations between 0.02 and 0.006 mg/L, which marginally exceeds the PCL (0.005 mg/L). Significant levels of arsenic were not identified in the marine sediment samples collected along the bulkhead near this well.

During Phase III investigations, diesel-range petroleum hydrocarbons were detected in groundwater southeast of the Port's Travel Lift at a concentration exceeding the PCL.

It is anticipated that concentrations of arsenic at well MW-4 and the diesel-range petroleum hydrocarbons southeast of the Port's Travel Lift would achieve compliance with the preliminary groundwater cleanup levels following implementation of the upland cleanup action alternatives described in Section 9.3 via natural attenuation in response to the removal of source material (i.e., arsenic- and petroleum hydrocarbon-impacted soil) or elimination of infiltration which leaches low concentrations of arsenic from the overlying soil, or a combination of both. Therefore, treatment of groundwater is not included in any of the cleanup action alternatives. However, as described in Section 6.2.2, long-term groundwater compliance monitoring program would be conducted to demonstrate that groundwater PCLs are achieved following implementation of the cleanup action.

9.1.3 Sediment

Three areas in the North Marina adjacent to the Lease Area have been found to have levels of one or more chemicals exceeding the Washington State SMS. Figure 4-7 shows the areas of SMS exceedances in shallow sediment. There is a comparatively small area around Outfall C at the extreme south end of the site that exhibits moderate exceedances for a few SVOCs. A larger area of nearshore sediments reaching from the former Tidal Grid along the north-south bulkhead to the Port's Travel Lift and west along the adjacent bulkhead has exceedances of the criteria for SVOCs, several metals, and TBT. Material between the dual bulkheads between Outfall A and the Travel Lift and west along the bulkhead to the sheetpile also has exceedances for a variety of organic compounds, metals, TBT, and petroleum.

Outfall C Area

A small area sediment around Outfall C at the south end of the Site contains several SVOCs at concentrations exceeding the SMS at location SG-13. Subsequent exceedances at SG-32 and SG-33 were shown to not represent unacceptable toxicity through bioassay tests conducted on samples collected at these locations in Phase III. Based on these findings, an area of approximately 1,000 square feet around SG-13 is established as a cleanup area. The single core collected at Outfall C had limited exceedances for several detected chemicals in the 1 to 3 foot horizon. Assuming a maximum contaminant depth of 5 feet and average depth of 2.5 feet in this area leads to a working estimated sediment volume of 100 CY.

Tidal Grid to Travel Lift Area

Nearshore sediments in the area from the Tidal Grid to the Port's Travel Lift and west along the bulkhead are also a candidate for cleanup action. These sediments involve an area of approximately 22,000 SF. Based on SMS exceedances observed at depths of up to 6.3 feet in nearshore cores, a maximum depth of approximately 10 feet of contaminated sediments is assumed to exist at the bulkhead. However, in most locations, a depth of 2 feet or less of sediment appears to exceed the cleanup levels. Using an average dredge depth of 4 feet, a working estimate of the volume of sediment requiring cleanup in this area is approximately 3,300 CY.

In addition to nearshore sediments located between the Tidal Grid and the Travel Lift, sediments further offshore beneath the outer portion of the marine railway may require cleanup. The basis for this conclusion is some limited evidence of contamination at depth in sediment that will have to be removed to restore navigation depth once the railway is demolished and removed. Core SC-3, collected approximately 120 feet from shore north of the railway, had marginal exceedances of the SQS levels for two analytes in a sample prepared from the 4- to 6-foot horizon. Core SC-4, also collected approximately 120 feet from shore and south of the railway, had a CSL exceedance for bulk TBT in the 3.5- to 5.5-foot horizon. Because the maximum depth of contamination was not established in every core location, a maximum depth of up to 10 feet is assumed to require removal under portions of the railway, with the depth assumed to decrease towards the outer portion of the railway. A working estimate of the volume of sediment potentially subject to removal under the outer section of the railway is 1,000 CY, but additional information including a bathymetric survey and likely additional sediment core collection and analysis will be needed to refine this figure and guide the dredging design.

Thus the total working estimated sediment volume in the tidal grid to travel lift area potentially subject to removal is 4,300 CY.

Dual Timber Bulkhead Area

The sediments between the dual bulkheads stretching between Outfall A and the Travel Lift and west to the newer sheetpile extend over an approximate area of 2,100 SF. Exceedances of the SMS were reported at depths of 2 to 3 feet for most of the sampled locations, but the maximum depth of SMS exceedances has generally not been established. In addition to the exceedances of the SMS, a plume of hydrocarbons was found in the bulkhead sediments in the area of Outfall A. Maximum petroleum concentrations tended to be found at depths of 1.5 to 4 feet. A possibly separate observation of hydrocarbon material was made at location BC-4, north of the Travel Lift. Based on the observed contaminant depths, it has been assumed that the bulkhead sediments are on average contaminated to a depth of 5 feet. This leads to an approximate volume of bulkhead sediments potentially subject to remediation of 400 CY.

9.2 Cleanup Action Technologies

This section describes cleanup action technologies associated with the retained general response actions in Tables 9-1 and 9-2. Common factors that influence the screening process include contaminant type and concentration, subsurface conditions (e.g., depth of contamination, geologic matrix), and access constraints (e.g., presence of surface features such as buildings).

9.2.1 Upland

General response actions for upland soils that were retained for further evaluation include: (1) institutional controls and long-term compliance monitoring; (2) engineered cap; and (3) removal and off-site disposal. These general response actions are broad actions that, singly or in combination, may be expected to meet the minimum threshold requirements for a MTCA-compliant cleanup action. Applicable cleanup technologies for these general response actions are discussed below.

Institutional Controls: Institutional controls per WAC 173-340-440 are measures undertaken to limit or prohibit activities that could interfere with the integrity of an interim action or cleanup action or that could result in exposure to hazardous substances at a site. Institutional controls may include:

- Physical measures such as fences;
- Use restrictions such as limitations on the use of property or resources; or requirements that a cleanup action occur if existing structures or pavement are disturbed or removed;

- Maintenance requirements for engineered controls such as the inspection and repair of monitoring wells, treatment systems, caps or groundwater barrier systems;
- Educational programs such as signs, postings, public notices, health advisories, mailings, and similar measures that educate the public and/or employees about site contamination and ways to limit exposure; and
- Financial assurances.

In addition to meeting each of the minimum requirements specified in WAC 173-340-360, cleanup actions are required not to rely primarily on institutional controls and monitoring where it is technically possible to implement a more permanent cleanup action for all or a portion of the site. Institutional controls are required for any alternative that leaves contamination in place at levels above the PCLs, which are based on an unrestricted land use scenario. Therefore, any cleanup action alternative that relies on containment technology to prevent exposure to hazardous substances above PCLs would require institutional controls per WAC 173-340-440. At a minimum, the institutional controls would require periodic inspections of the engineered cap, maintenance of the cap to ensure its integrity and proper function, and an environmental covenant appropriately to document the institutional controls on the property title report. In addition to complying with applicable MTCA provisions in WAC 173-340-420 and WAC 173-340-440, institutional controls must also meet the requirements of the Uniform Environmental Covenants Act (UECA) enacted by the State of Washington in 2007. Ecology is required to review periodically compliance with institutional control requirements under WAC 173-340-420 every five years, as long as the institutional controls are in effect. Institutional controls applied at the Site would also be compatible with current/future zoning and future site redevelopment plans.

Containment - Engineered Cap: This technology is a type of containment response, where exposure to hazardous substances is physically prevented by placing an engineered cap over the affected soil. Three types of engineered caps would be applicable to the Site:

- New asphalt pavement for areas that currently are not paved. The new asphalt would consist of 2 to 6 inches of asphalt over a compacted base material. Thicker asphalt would be applied in areas of identified PCB soil contamination above 1,000 µg/kg PCBs to meet the requirements of TSCA an engineered cap. Preparation of the capped area would include removal of aboveground structures such as the wooden racks and final grading of the area to establish desired grades of the new pavement.
- Asphalt overlay – Existing paved areas would be improved by placement of an asphalt overlay and sealcoat over existing asphalt paved surfaces.
- Building Floor Slabs and Foundations – Existing building floor slabs and foundations would be used in combination with institutional controls to prevent exposure to contaminated soil beneath the buildings. These structures are generally adequate to prevent direct contact with the underlying soils, but would require improvements in some areas to seal cracks or replace portions of the slabs that have been removed. The engineering design would integrate new asphalt

pavement or overlay where needed to provide a continuous containment system. The use of the floor slabs and foundations would be adequately protective as long as these structures are periodically inspected and maintained.

- High Density Polyethylene cover – Two buildings on the Everett Shipyard lease property have wooden floors and soil contamination beneath the building above PCLs. If the building floor or another type of physical barrier in combination with institutional controls is not considered adequate to prevent potential exposure to these soils during the design phase, then another type of barrier such as an HDPE cover could be placed over the affected area to prevent direct contact with the contaminated soil.

Periodic inspections and maintenance of the engineered cap would be required per WAC 173-340-440 to ensure that the engineered cap remains protective of human health and the environment. Additionally, other cleanup actions may be appropriate in the future if the engineered cap is disturbed during future site redevelopment work. Institutional controls would need to address actions to be undertaken in the event that the engineered cap is compromised in the future.

Soil Excavation and Off-Site Disposal: Excavation and off-site disposal is a general removal/disposal response action applicable to upland soils at the Site. This cleanup action technology may include:

- Demolition and removal of existing buildings;
- Demolition and removal of subsurface features including existing pavement and buried structures (e.g., skids);
- Excavation, load-out, and off-site disposal of contaminated soil;
- Soil confirmation analytical testing to ensure cleanup standards are met;
- Placement and compaction of clean imported fill material; and
- Re-vegetating the affected area if necessary.

Excavated soil would be tested for compliance with applicable Dangerous Waste regulations where appropriate. Based on the soil analytical results, the excavated soil would be transported to an appropriately licensed facility for ultimate disposal.

9.2.2 Marine Sediment

General response actions for marine sediments that were retained include: (1) institutional controls and long-term monitoring, (2) monitored natural recovery, (3) containment- in situ capping, (4) in situ treatment (porewater), (5) sediment removal by dredging, and (6) habitat enhancement. In situ treatment is a less common general response action that has been under development in recent years and has been shown to work well when used in combination with in situ capping.

Institutional Controls

As described for upland soils, institutional controls are required for any alternative that leaves contamination in place at levels above the CLs. Sediment institutional controls could include restrictions on activities occurring in the marina or requirements that a cleanup action occur if the cap is disturbed or removed. Periodic inspections, maintenance, and long-term compliance monitoring may be required as long as sediments exceed the CLs. Institutional controls applied at the Site must also be compatible with current/future use of the aquatic portion of the Site.

Monitored Natural Recovery

Monitored natural recovery (MNR) is a remedy for contaminated sediment that typically relies on ongoing, naturally occurring processes to contain, destroy, or reduce the bioavailability or toxicity of contaminants in sediment. Not all natural processes result in risk reduction; some may increase or shift risk to other locations or receptors. MNR usually includes acquisition of information over time to confirm that risk-reduction processes are occurring.

When natural recovery appears to be the most appropriate remedy, but the rate of sedimentation or other natural processes is insufficient to reduce risks within an acceptable time frame, engineering controls may be used to accelerate the recovery process. This process is known as enhanced natural recovery and may include placing a thin layer of clean sediment or sand.

Based on the results of the marine sediment investigation, there is no conclusive evidence that ongoing burial or degradation/transformation, or dispersion of contaminants are reducing risks to a level that could meet CLs within an acceptable timeframe. MNR is retained to be used in combination with other technologies, but would not be used as the primary technology for any cleanup alternative. Application of MNR would need to be consistent with maintaining adequate vessel’s draft for the current and planned future use of the aquatic portion of the Site located within the North Marina.

Containment - In Situ Capping

In situ capping refers to the placement of a subaqueous covering or cap of clean material over contaminated sediment that remains in place. Caps are generally constructed of granular material, such as clean sediment, sand, or gravel. A more complex cap design can include geotextiles, liners, and other permeable or impermeable elements in multiple layers that may include additions of material to attenuate the flux of contaminants (e.g., organic carbon). Depending on the contaminants and sediment environment, a cap is designed to reduce risk through the following primary functions:

- Physical isolation of the contaminated sediment sufficient to reduce exposure due to direct contact and to reduce the ability of burrowing organisms to move contaminants to the surface
- Stabilization of contaminated sediment and erosion protection of sediment and cap, sufficient to reduce re-suspension and transport to other sites
- Chemical isolation of contaminated sediment sufficient to reduce exposure from dissolved and colloidally bound contaminants transported into the water column

In-situ caps may be designed with different layers to serve these primary functions or in some cases a single layer may serve multiple functions.

Based on current use of the marina, capping the entire area of sediment contamination would not be appropriate. Navigation restrictions in the marina dictate that certain minimum water depths be maintained. Low-profile caps would likely be at least 12-inches thick for the hazardous substances at this site and conventional sediment caps could be as thick as 3 feet. However, capping could be applicable in areas that are inaccessible because they are beneath fixed structures (e.g., docks) or adjacent to the existing bulkhead, where dredging to full required depth might compromise stability. For these reasons, in situ capping is retained for further evaluation.

In-Situ Treatment

Generally in situ treatment involves the biological, chemical, or physical treatment of contaminated sediment in place. Potential in situ treatment methods include the following (USEPA, 2005):

- Biological Treatment*:* Enhancement of microbial degradation of contaminants by the addition of materials such as oxygen, nitrate, sulfate, hydrogen, nutrients, substrate (e.g., organic carbon), or microorganisms to the other sediment or as part of a reactive cap;
- Chemical Treatment: The destruction of contaminants through oxidation and dechlorination processes by providing chemical reagents, such as permanganate, hydrogen peroxide, or potassium hydroxide, to the sediment or with a reactive cap; and
- Immobilization Treatment*:* Solidification, stabilization, or sequestering of contaminants by adding coal, coke breeze, Portland cement, fly ash, limestone, or other additives to the sediment for encapsulating the contaminants in a solid matrix and/or chemically altering the contaminants by converting them into a less bioavailable, mobile, or toxic form.

Most in-situ treatment technologies for sediment are in the early stages of development, and few methods are currently commercially available. Available methods are generally placed over contaminated sediment as part of a multilayer cap with additional treatment properties. In situ treatment is retained for further evaluation for potential use in conjunction with sediment capping.

Dredging

Dredging is the most common method of removing contaminated sediment from a water body while it is submerged. Dredging typically involves transporting sediment to a location for treatment and/or disposal. It also frequently includes treatment of water from dewatered sediment prior to discharge to an appropriate receiving water body. Sediment is routinely dredged for the maintenance of navigation channels. The objective of navigational dredging is to remove sediment as efficiently and economically as possible to maintain waterways for recreational, national defense, and commercial purposes. The term “environmental dredging” describes dredging performed specifically for the removal of contaminated sediment. Environmental dredging is intended to remove sediment contaminated above certain action levels while minimizing the spread of contaminants to the surrounding environment during dredging (National Research Council, 1997).

Key components to be evaluated when considering dredging as a cleanup method include sediment removal, management of turbidity and sediment residuals, transport, staging, treatment (pretreatment, treatment of water and sediment, if necessary), and disposal (liquids and solids). The simplest dredging projects may consist of as few as three of these key components. More complex projects may include most or all of these components. In general, fewer sediment re-handling steps leads to lower implementation risks and lower cost.

Dredging involves mechanically grabbing, raking, cutting, or hydraulically scouring the bottom of a waterway to dislodge the sediment. Once dislodged, the sediment may be removed from a waterway either mechanically with buckets or hydraulically by pumping. Dredges are categorized as either mechanical or hydraulic depending on the method for removing the dredged material.

Mechanical dredges offer the advantage of removing the sediment at nearly the same solids content and volume as the in situ material. Little additional water is entrained with the sediment as it is removed. As a result, the volumes of contaminated material and process water to be disposed, managed, and/or treated are minimized. Common types of mechanical dredges include the clam shell and enclosed bucket.

Hydraulic dredges remove and transport sediment in the form of a slurry through the inclusion of high volumes of water via suction-based equipment. The total volume of material processed may be greatly increased and the solids content of the slurry may be considerably less than that of the in situ sediment.

Habitat Enhancement

Active remediation of contaminated sediments is expected to enhance the quality of the marine habitat at the site. Removal of the pilings associated with the marine railway will also reduce the potential for contact with and release of creosote. Similarly, remediation of petroleum-contaminated soils behind the bulkhead in the vicinity of Harbor Marine is expected to curtail ongoing releases of petroleum into the marine environment, further improving habitat quality.

As described in the Agreed Order, it is unlikely that meaningful habitat restoration opportunities exist at the site because of current and future land use. Additional marine habitat enhancement would likely be dependent on potential future reconfiguration of the marina facilities and projected future marina operations. For example, replacement of creosoted timber bulkheads would reduce the potential for contact with and release of creosote. If the future marina configuration includes nearshore areas that will not be subject to vessel traffic, it is possible that some increase in sloped intertidal areas could be incorporated in the remedial design.

9.3 UPLAND CLEANUP ALTERNATIVES

The potential upland cleanup alternatives for soil media presented in this section include combinations of containment (engineered caps and existing building slab) and excavation of various upland areas of the Site and off-site disposal of impacted soils, concrete, asphalt and building demolition debris. Institutional controls and long-term compliance monitoring would be required for all of the alternatives described below.

Following implementation of each of these alternatives, residual contamination will remain at the site. The extent of residual contamination will vary from alternative to alternative; however, a Soil/Groundwater Management Plan would be an element of the each upland cleanup action alternative and a key component of the cleanup action. Under the Soil/Groundwater Management Plan, upon demolition of the structures, exposed soils containing concentrations of hazardous substances above PCLs would be:

- Characterized to delineate the nature and extent of contamination,
- Soils above PCLs would be excavated and disposed of at an approved off-site disposal facility, and
- Compliance sampling would be performed to ensure that all impacted soils above PCLs have been removed.

9.3.1 Upland Alternative 1 – Targeted/Limited Excavation of PCB-Impacted Soil (1,300 CY) Above Remediation Level of 10,000 µg/kg and Bulkhead Soils, Off-Site Disposal, Engineered-Cap, and Institutional Controls and Long-Term Monitoring

Alternative 1 relies primarily on engineered capping with targeted/limited excavation and off-site disposal of impacted soil, institutional controls, and long-term monitoring to achieve cleanup standards. This alternative involves the least amount of soil removal compared to the other alternatives. Uplands Alternative 1 involves excavation of PCB-impacted soil above the remediation level of 10,000 µg/kg and petroleum hydrocarbons impacted soil east of the bulkhead near the Port's Travel lift, and placement of an engineered cap over all other areas of the Site where concentrations of indicator hazardous substances in soil exceed the PCLs, as shown on Figure 9-1. Due to the depth of the petroleum contaminated soil (e.g., about 14 feet bgs) and its proximity to the bulkhead and the Harbor Marine building, excavation of this petroleum-impacted material near the Travel lift would likely require shoring to protect the adjacent structures and to provide a safe working environment. Additional engineering analysis would be required to ensure protection (or possibly demolition) of the bulkhead during the excavation of adjacent soils, which would include both considerations of construction methods, sequencing, and timing. These issues will be evaluated during the remedial design phase.

The engineered cap would consist of a combination of new asphalt pavement where pavement currently does not exist and improvements to existing pavement, including asphalt overlay and seal coat. Existing buildings and underlying impervious flooring would remain in place to serve as a cap. Two buildings on the Site do not have concrete or asphalt floors: the office and wood shop. A HDPE liner or other acceptable type of physical barrier would be installed over the affected building floor area to prevent direct contact to hazardous substance above unrestricted cleanup levels. These buildings will be inspected during the remedial design to determine if additional measures are necessary in order to provide an additional barrier for prevention of direct contact to the soils below. Based on inspection, additional measures (e.g., physical barrier, warning signs, etc.) to prevent direct contact to hazardous substances above PCLs would be implemented as needed.

The conceptual design for this alternative would include re-grading the existing unpaved areas to establish a more level surface and placing about 3 to 6 inches of hot asphalt over existing unpaved areas. Site preparation would include the removal of aboveground or shallow buried structures that would interfere with the construction of the cap (e.g., skids). However, all of the existing buildings at the Site would remain under this alternative. The grading work would include the net import of clean materials to raise the elevation of the existing surfaces, especially in the west-central portion of the site where the unpaved surface is currently several feet below the surface of the surrounding area. Minor adjustments would be made to the existing catch basins to account for elevation differences in the final grade.

The actual thickness of the new paved surfaces and underlying base materials would depend upon the final use of the site (e.g., whether the covered area would be subject to heavy vehicle traffic) and whether underlying soils have concentrations above 1,000 µg/kg PCBs. The specific thickness would be further developed in the cleanup action design phase. The existing asphalt surfaces would be improved by placing an overlay and seal coat over the existing pavement. Existing concrete surfaces would remain in place to serve as the cap. Cracks in the concrete would be sealed as appropriate.

Under this alternative all soil at the Site containing PCBs at a concentration exceeding 10,000 µg/kg would be removed. This would include the excavation of approximately 640 CY of PCB-impacted soil above the PCB remediation level of 10,000 µg/kg immediately south of Building 9 and extending beneath the south half of Building 9. For costing purposes, it was assumed that approximately 240 CY of soils with PCB concentrations equal to or greater than 50,000 µg/kg would be disposed of as TSCA remediation waste. In addition, approximately 1,000 CY of petroleum hydrocarbon-impacted soil would be excavated in the bulkhead area (Figure 9-5). For costing purposes, it is estimated that one-third of the volume of bulkhead soil (330 CY) is clean (i.e., meets MTCA Method A unrestricted land use standards) and acceptable for use as backfill, once confirmed by sampling and analysis. The remaining 670 CY would be disposed of off-site as nonhazardous environmental media.

Buildings would not be demolished and removed for this alternative. Soils would be preliminarily classified based on the RI data. However, additional soil confirmation analytical testing would be conducted to confirm the waste designation as TSCA remediation waste or non-hazardous environmental media and to verify that the PCB-impacted soil above the remediation level is removed from the Site. After soil confirmation testing is completed, the area would be backfilled with clean imported fill material and an engineered cap installed.

Figure 9-1 illustrates a conceptual cleanup action plan for Alternative 1. Key components of this alternative include:

- Excavate approximately 240 CY of soils with PCB concentrations equal to or greater 50,000 µg/kg to an approximate depth of 4 feet bgs to meet the remediation level of 10,000 µg/kg PCBs. This area would be backfilled, compacted, and covered with engineered cap meeting the requirements 40 CFR 761.61.

- Excavate approximately 400 CY of soils with PCB concentrations greater than or 10,000 µg/kg and less than 50,000 µg/kg to an approximate depth of 3 feet bgs. This area would be backfilled, compacted, and covered with engineered cap meeting the requirements 40 CFR 761.61.
- Excavate approximately 1,000 CY of petroleum-impacted soil above PCLs to a depth of approximately 14 feet bgs in the bulkhead excavation area, located southeast of the Port's Travel Lift. This area would be backfilled, compacted, and covered with asphalt pavement.
- Dispose of off-site excavated soil at permitted disposal facilities, except for one-third of the volume of bulkhead soil (330 CY) which is assumed to be clean and would be used as backfill once confirmed by sampling and analysis.
- Conduct soil sampling and chemical analysis to confirm that sidewall soil samples are below 10,000 µg/kg for PCBs and excavation bottom soil samples are below PCLs for all indicator hazardous substances.
- Install approximately 58,000 SF of new asphalt pavement in areas that currently are not paved, including the removal of existing structures (except buildings) that would impede installation of the engineered cap.
- Improve approximately 55,000 SF of existing asphalt pavement by placement of asphalt overlay and seal coat over existing asphalt paved surfaces and sealing cracks in concrete surfaces.
- Install 3,000 SF of HDPE liner (or other type of acceptable physical barrier) in portions of existing building with wooden floors
- Remove above ground wooden skids to facilitate placement of the asphalt cap.
- Clean out and modify, as needed, the stormwater system in areas of existing and new paved surfaces.
- Install additional one new monitoring well in the bulkhead area.
- Conduct at least two years of groundwater performance monitoring using new and existing groundwater monitoring wells.
- Conduct long-term maintenance consisting of biannual inspections (every two years) and periodic sealcoat of pavement (assumed every five years).
- Implement environmental covenant and five-year periodic reviews by Ecology.

As noted above, institutional controls would be implemented following installation of the engineered cap to address areas where contamination remains above PCLs. Institutional controls would include a Soil/Groundwater Management Plan and an environmental covenant. The Soil/Groundwater Management Plan would document procedures to be implemented in the event that the integrity of the engineered cap is compromised during subsequent property redevelopment, upon demolition of existing buildings, or other Site activities. Proper implementation of the Soil/Groundwater Management Plan would protect human health and the environment during and after redevelopment. A plan would also be developed to describe inspections and long-term maintenance requirements of the engineered-cap to ensure long-term protection of this alternative. Under Alternative 1, 15% of indicator hazardous substance mass would be removed from the site.

9.3.2 Upland Alternative 2 –Excavation of 9,400 CY of Soil and Off-site Disposal, Engineered Cap, and Institutional Controls and Long-Term Monitoring

This alternative relies on excavation of approximately half of the impacted soils, installation of engineered cap and institutional controls to achieve preliminary cleanup standards. This alternative includes all of the soil excavation from Alternative 1, plus excavation of soil in unpaved areas outside of structures. Figure 9-2 illustrates a conceptual cleanup action plan for Alternative 2. Key components of Alternative 2 include:

- Perform soil excavation (1,600 CY), soil confirmation sampling, and barrier installation in wooden buildings equivalent to Alternative 1 above and excavate approximately 8,100 CY of additional soil within existing unpaved areas of the Site for a total excavation of approximately 9,700 CY.
- Dispose of off-site excavated soil at permitted disposal facilities, except for about one-third of the volume of bulkhead soil (330 CY) which is assumed to be clean and would be used for use as backfill once confirmed by sampling and analysis.
- Implement soil confirmation sampling in unpaved areas to verify that bottom samples from the excavation are below PCLs for all indicator hazardous substances.
- Remove above ground wooden and concrete portions of skids in unpaved areas to facilitate excavation and install engineered cap. The engineered cap would include improvement to approximately 56,000 SF of existing asphalt pavement and sealing cracks in existing concrete paved surfaces.
- Install approximately 3,000 SF of HDPE liner in portions of existing buildings with wooden floors.
- Clean out the stormwater system and modify, as needed, in existing paved areas.
- Install one new monitoring well in the bulkhead area.
- Conduct at least two years of groundwater performance monitoring using new and existing groundwater monitoring wells.
- Conduct long-term maintenance consisting of biannual inspections and periodic sealcoat of pavement (assumed every five years).
- Implement environmental covenant and five-year periodic reviews by Ecology.

Similar to Alternative 1, institutional controls would be implemented following implementation of Alternative 2 to address areas hazardous substances that would remain in place under existing paved surfaces. Institutional controls would include a

Soil/Ground water Management Plan and an environmental covenant. Under Alternative 2, 56% of indicator hazardous substance mass would be removed from the site.

The Soil/Groundwater Management Plan would document procedures to be implemented in the event that the integrity of the engineered cap is compromised during subsequent property redevelopment, upon building demolition, or other Site activities. Proper implementation of the Soil/Groundwater Management Plan would protect human health and the environment during and after redevelopment. A plan would also be developed to describe inspections and long-term maintenance requirements of the engineered cap to ensure long-term protection of this remedy.

9.3.3 Upland Alternative 3 – Building Demolition, Mass Excavation of 18,800 CY of Soil and Off-site Disposal and Institutional Controls and Long-Term Monitoring

Alternative 3 is the most permanent remedy developed for the upland cleanup alternatives and relies primarily on building demolition, massive excavation and off-site disposal of all soil containing hazardous substances above the PCLs. The exception is the impacted soil beneath the sidewalk and West Marine View Drive ROW. Figure 9-3 illustrates a conceptual cleanup action plan for Alternative 3. Key components of Alternative 3 include

- Conduct hazardous materials survey and abatement of existing building structures, including all buildings within the Site and the former Fish Processing Building (entire building).
- Demolish/remove/dispose of buildings and floors (8 structures including fish processing building and two covered areas and two sheds/out-buildings)
- Demolish/remove/dispose of existing paved surfaces within footprint of the excavation.
- Demolish/remove/dispose of wood and concrete structures and other miscellaneous debris within the excavation footprint.
- Properly decommission groundwater monitoring wells within the footprint of the excavation.
- Perform soil excavation (approximately 9,700 cubic yards), and soil confirmation sampling, equivalent to Alternative 2 above and excavate approximately 9,400 CY of additional soil within existing paved areas of the Site for a total excavation of approximately 19,100 CY.
- Dispose of off-site excavated soil at permitted disposal facilities, except for one-third of the volume of bulkhead soil (330 CY) which is assumed to be clean for use as backfill once confirmed by sampling and analysis.
- Clean out remaining stormwater system.
- Conduct soil confirmation analytical testing of excavation sidewall and bottom samples to confirm that PCLs are achieved.

- Install one new monitoring well in the bulkhead area and three new monitoring wells between the former operation areas and the marina and conduct two years of groundwater performance monitoring using the new groundwater monitoring well network.
- Implement environmental covenant and five-year periodic reviews by Ecology for the area under the sidewalk and public ROW where hazardous substances remain in soil above preliminary soil cleanup levels.

Under this alternative, site restoration would include backfill and compaction of clean imported fill materials. No new pavement or cover over the excavated soils would be required, except for the limited excavation area between the marina and the Lease Area and the bulkhead excavation area. Under Alternative 3, 99% of indicator hazardous substance mass would be removed from the site.

Institutional controls would include a Soil/Groundwater Management Plan and an environmental covenant. The Soil/Groundwater Management Plan would document procedures to be implemented in the event that the integrity of the cap (sidewalk and pavement in West Marine View Drive ROW) is compromised during future construction activities in this area. Proper implementation of the Soil/Groundwater Management Plan would protect human health and the environment in the event that subsurface construction activities occur near the sidewalk in the future. A plan would also be developed to describe inspections and long-term maintenance requirements of the cap to ensure long-term protection of this remedy.

9.3.4 Upland Alternative 4 – Limited Building Demolition (Everett Engineering Buildings 7 and 9), Bulk Excavation of 14,800 CY of Soil including All Contaminated Soil near Puget Sound and Soil Containing High Mass of Contamination, Off-site Disposal, Installation of Engineered Cap, and Institutional Controls and Long-Term Monitoring

Alternative 4 consists of excavation of soils containing high mass of contamination above the PCLs with off-site disposal. Excavated soils consist of the most contaminated soils and generally are not covered by buildings or concrete pavement; they include all impacted soil in close proximity to Puget Sound and all of the readily accessible contaminated soil within the former Everett Shipyard operations yard including the western area near the former Fish Processing building. The soils beneath Building 9 where high levels of PCBs are present and beneath Building 7 where high levels of petroleum impacted soils are located would also be excavated. Two Everett Engineering buildings (Buildings 7 and 9) are required to be removed under Alternative 4 so that contaminated soil beneath these buildings can be removed.

Compared to Alternatives 1 and 2, Alternative 4 includes additional excavation of most of PCB-contaminated soil above the 1,000 µg/kg PCL, achieving the 99% PCBs mass removal. Like alternatives 1 through 3, this alternative includes removal of petroleum hydrocarbon impacted soil near the bulkhead. Figure 9-4 illustrates a conceptual cleanup action plan for Alternative 4. Key components of Alternative 4 include:

- Perform soil excavation, soil confirmation sampling, and barrier installation in wooden buildings equivalent to Alternative 2 above (approximately 9,700 cubic yards) and excavate approximately 5,400 CY of additional soil within existing paved areas and buildings of the Site for a total excavation of approximately 15,100 CY.

- Dispose of off-site excavated soil at permitted disposal facilities, except for an estimated one-third of the bulkhead soil volume (330 CY) which is assumed to be clean and suitable for use as backfill once confirmed by sampling and analysis.
- Conduct additional soil confirmation analytical testing of excavation sidewall and bottom samples to confirm that PCLs are achieved.
- Install engineered cap on remaining soils containing concentrations of hazardous substances above PCLs beneath buildings (excluding Buildings 7 and 9), pavement, or other structures. The engineered cap would include improvement to approximately 4,500 SF of existing asphalt pavement by placement of asphalt overlay and seal coat over existing asphalt paved surfaces and sealing cracks in concrete surfaces.
- Install approximately 3,000 SF of HDPE liner (or other type of acceptable physical barrier) in portions of existing buildings with wooden floors.
- Clean out stormwater system and modify, as needed, in new paved surfaces.
- Install one new monitoring well in the bulkhead area and three new monitoring wells between the former operation areas and the marina and conduct two years of groundwater performance monitoring.
- Implement environmental covenant and five-year periodic reviews by Ecology.

Under this alternative, site restoration would include backfill and compaction of clean imported fill materials. No pavement or cover over the excavated soils would be required, except for the limited excavation area between the marina and the Lease Area and the bulkhead excavation area. Under Alternative 4, 98% of indicator hazardous substance mass would be removed from the site.

Similar to other alternatives, institutional controls for Alternative 4 would include a Soil/Groundwater Management Plan and an environmental covenant to address areas of hazardous substances above PCLs that would remain in place under existing paved surfaces. The Soil/Groundwater Management Plan would document procedures, including those listed in Section 9.3, to be implemented in the event that the integrity of the engineered cap is compromised and contaminated soil becomes exposed (e.g., contaminated soil under buildings or other capping features becomes exposed during future Site activities). Proper implementation of the Soil/Groundwater Management Plan would protect human health and the environment during and after redevelopment. A plan would also be developed to describe inspections and long-term maintenance requirements of the cap to ensure long-term protection of this remedy.

It's noted that under Alternative 4, the areas subject to the Soil/Groundwater Management Plan are the pavement area north of Building 7 and all buildings on the Site except for Buildings 7 and 9 ("the remaining structures"). If the remaining structures are demolished prior to the beginning of major upland remedial construction, the

Soil/Groundwater Management Plan would be implemented concurrent with other upland remedial construction activities.

9.4 MARINE SEDIMENT CLEANUP ALTERNATIVES

Two cleanup alternatives have been developed for the marine sediments at the Site. The first alternative involves a combination of removing a portion of the contaminated sediments using dredge equipment and containing the remaining contaminated sediments in place. The second alternative consists of complete removal of sediments exceeding the SMS.

Both sediment alternatives include removal and demolition of the marine railway and removal of the sediments that have accumulated under the railway to restore a grade consistent with the rest of this portion of the North Marina. Each of the alternatives will require temporary relocation of vessels and floating structures to provide access for cleanup action activities. Conceptual cleanup action plans for each of the two alternatives are depicted in Figures 9-6 and 9-7.

9.4.1 Marine Sediment Alternative 1 – Targeted Dredging and Containment

This alternative includes dredging of selected areas based on accessibility. The marine railway would be demolished and sediments beneath the railway would be removed. Areas that are difficult to access, e.g., under docks or piers, would be capped rather than dredged. In the area of the dual wooden bulkhead near the Port's Travel Lift this could include partial removal, followed by capping. Containment would not be utilized in areas where navigation depth is critical to current and future marina usage. The conceptual cleanup action plan for Alternative 1 is shown on Figure 9-6.

This alternative assumes accessible areas would be dredged using a clamshell dredge or environmental bucket. A fixed-arm dredge may also be suitable for these areas. The dredged sediments could be dewatered on a small barge, with decant water drained overboard, or possibly direct-loaded to lined containers for truck and/or rail transportation for off-site disposal. A silt curtain would be used to contain sediments that are disturbed during dredging within the work area. Surface water monitoring would be used for the duration of the dredging to confirm compliance with applicable surface water requirements and laws.

Alternative 1 assumes that a portion of the dredged sediments, e.g. the material beneath the outer portion of the marine railway area, will be suitable for open-water disposal. Dewatered sediments unsuitable for open-water disposal would be transferred from the barge to a lined 20-foot container for shipment to an off-site licensed landfill. The closest rail facility is less than three miles away in Everett, where containers would be transferred from a truck to rail car for shipment to a landfill. Confirmation sampling would be required to document successful cleanup of the dredged areas.

Rather than conventional capping that typically involves placing up to 3 feet or more of imported material, this alternative relies on lower profile cover approaches. The conceptual design for costing purposes includes a proprietary clay polymer composite thickness of 6 inches when hydrated, and includes a 1-inch thick organo-clay layer for in situ treatment of pore-water. The composite material would be covered with a 4- to 6-

inch layer of rock for protection and further consolidation of the treatment layer. The conceptual design involves a total cap thickness of approximately 12 inches.

The clay polymer is designed to swell and form a continuous and highly impermeable isolation barrier between contaminated sediments and the overlying water. The clay polymer composite is intended to provide containment with potentially superior impermeability, stability, and erosion resistance relative to traditional capping materials. The polymer composite considered for the conceptual design is not intended to provide insitu treatment to the underlying sediment, however, the additional organoclay layer that was assumed for costing purposes would provide insitu treatment of pore water that travels from the contained sediment through the composite cap material. The composite cap material that was used for the conceptual design is just one type of innovative and proprietary material that could be used. Other vendors have developed similar composite materials that provide a thinner cap thickness (relative to traditional sand caps) and may also treat the sediment or porewater depending on the site-specific contaminants and selected cap media.

Other composite caps may include reactive material that would be selected based on the contaminants present at the site. The adsorptive capacity of the material reduces the required cap thickness. The reactive material can be either rolled out in the form of absorptive material sandwiched between layers of geotextile or blown into place in the form of a composite aggregate. The conceptual design for Alternative 1 assumes a composite aggregate which would simplify placement in areas under docks/piers because a “stone-slinger” or similar conveyor-based equipment could be used for placements of cap materials.

Long-term monitoring and an environmental covenant would be required in Alternative 1 to assure that contaminants left in place continue to be contained. For costing purposes, monitoring would consist of porewater sample collection at a minimum of 4 locations commencing one year after capping is complete and then once every 5 years for a total of 20 years.

9.4.2 Marine Sediment Alternative 2 - Mass Dredging

Alternative 2 includes dredging all of the sediment exceeding the CLs as shown on Figure 9-7. As described for Alternative 1, the marine railway would be demolished and sediments beneath the railway removed. Where docks and piers can be removed to access the sediment, clamshell dredging would be used to remove much of the sediment. Shore-based equipment may be used to remove nearshore sediment, particularly if removal can be coordinated around favorable low tides expected to expose sediments accumulated against and between bulkheads. Sediments removed from between the bulkheads would be replaced with suitable clean fill to stabilize the bulkheads.

The conceptual design of Alternative 2 assumes that clamshell, environmental bucket or fixed-arm dredging would be used for the accessible areas. It is assumed that a portion of the dredged sediments will be suitable for open-water disposal. For those sediments not suitable for open-water disposal, much of the dewatering would occur on a small barge in the area of sediment removal. A silt curtain would be used to contain sediments that are disturbed during dredging within the work area. Surface water monitoring would be used for the duration of dredging to confirm compliance with applicable surface water requirements and laws. Decant water from dredged sediments may also require monitoring prior to discharging to surface water. Specific monitoring requirements would be determined during design and may be similar to those for surface water monitoring. Testing may be required to determine if water quality complies with applicable surface water regulations and testing frequency would be decreased as compliance is confirmed or increased if sample results exceed applicable surface water criteria.

Dewatered sediments would be transferred from the barge to a lined 20-foot container for shipment to an off-site licensed landfill. The closest rail facility is less than 3 miles away in Everett, where containers would be transferred from a truck to rail, for shipment to a landfill.

In areas that are inaccessible, hydraulic dredging (suction-based equipment) could be used. However, hydraulic dredging would generate significantly more water than clamshell dredging, since the sediments would be removed in a slurry of roughly 10- to 20-percent solids rather than 50 percent solids typical of clamshell dredging. Consequently, significantly more resources would be required to dewater the sediments prior to transport off site. Furthermore, hydraulic dredging does not work well in areas of high debris, such as under marina docks. It is assumed that hydraulic dredging will not be a major component of Alternative 2. Ideally mechanical (clamshell, environmental bucket, or fixed-arm) dredging would be used to remove sediment. However, due to uncertainties related to access restrictions and timing of marina redevelopment, for costing purposes hydraulic dredging was conservatively assumed for up to 33% of the total dredged volume, typical of FS-level cost estimates.

Dewatering and water handling could be a substantial activity due to the need for large upland areas to construct settling ponds and the time required for settling of the dredged sediment-water mixture. Accumulated water would likely require particle filtration and carbon treatment prior to discharge to the local sanitary sewer system with an approved permit. Compliance sampling of treated water would also be required as part of the discharge permit. Confirmation sampling would be required to document removal of the dredged materials.

Because Alternative 2 would remove the sediment and would not include capping, long-term monitoring and environmental covenants for future dredging or development would not be needed.

10.0 ANALYSIS OF CLEANUP ALTERNATIVES

This section summarizes an evaluation of the cleanup action alternatives with respect to the MTCA and SMS criteria discussed in Section 8.0 (Evaluation Criteria). Section 10.1 provides an evaluation of upland alternatives and a summary of the DCA for upland alternatives. Section 10.2 provides an evaluation of marine sediment alternatives.

10.1 EVALUATION OF UPLAND ALTERNATIVES

This section evaluates each of the cleanup action alternatives for the upland portion of the Site against the minimum threshold requirements and other MTCA requirements as described in Section 8.0. Table 10-1 presents a summary of MTCA cleanup action alternatives evaluation and the results of DCA ranking for upland portion of the Site. The percent of contaminant mass removal for each key indicator hazardous substance (Arsenic, Lead, TPH, cPAHs, PCBs) is also summarized in Table 10-1. Figures summarizing upland Alternatives 1, 2, 3, and 4 are shown on Figures 10-1, 10-2, 10-3 and 10-4, respectively. The approach used to estimate total contaminant mass at the Site and the mass removed by each alternative is described in Appendix I.

10.1.1 Threshold Requirements

Cleanup action Alternatives 3 and 4 identified in Section 9.3 for upland soils meet the minimum threshold requirements for cleanup actions under MTCA. Alternatives 1 and 2, however, may not fully meet the minimum threshold requirements because of the uncertainties associated with leaving relatively large percentages of contaminant mass beneath the engineered cap combined with the uncertainties associated with future site redevelopment. This section provides an evaluation of each alternative against each threshold requirement.

Protection of Human Health and the Environment

Each cleanup action alternative for upland soils is protective of human health and the environment because potential exposure pathways from direct exposure to human and ecological receptors are eliminated. Alternatives 1 and 2 include capping plus limited excavation and institutional controls to ensure protectiveness. Alternative 3 relies primarily on excavation to ensure protection of human health and the environment, but also includes containment and institutional controls for the small amount of contaminated soil that would be capped adjacent to West Marine View Drive. Alternative 4 also relies primarily on excavation, but a larger amount (21%) of contaminated soil (and approximately 2% of indicator hazardous substance mass) would remain on the Site when compared to Alternative 3.

Planned future land use would require, at a minimum, replacement of the portions of the planned cap for Alternatives 1 and 2, and would likely require removal and offsite disposal of a significant amount of additional contaminated Site soil to accommodate utilities, building foundations, and finish grades. As a result, the engineered caps for Alternatives 1 and 2 would most likely need to be significantly reconfigured or entirely replaced during redevelopment to maintain protectiveness of human health and the environment. Alternative 3 and 4 would require more limited, if any, reconfiguration during redevelopment. This component of the redevelopment would be addressed by institutional controls including the implementation of a Soil Management Plan, which would describe procedures for the handling and management of contaminated soils encountered during site redevelopment.

Compliance with Cleanup Standards

Each cleanup action alternative for upland soils would comply with cleanup standards as discussed in Section 6.0. As described in Section 6.6.2, each alternative may be determined to comply with cleanup standards provided that six requirements listed in WAC 173-340-740(6)(f) are met for the containment of soils beneath an engineered cap. Alternative 3 meets all six requirements under all future land use scenarios. Alternatives 1 and 2, however, would only comply with cleanup standards in the long-term if the capping systems identified for these two alternatives can be replaced by buildings and other capping surfaces constructed as part of Site redevelopment and only if redevelopment can accommodate containment of the contaminated soil within the context of planned future roadways, utilities, building foundations and site grades. Otherwise, the cleanup action would have to be redefined as part of Site redevelopment to include partial or complete removal and off-site disposal of contaminated soil to maintain compliance with cleanup standards.

Alternative 4 removes the vast majority of contaminant mass (Table 10-1) and significantly reduces the footprint of impacted soil on the uplands Site (Figure 10-4). For the contaminated soils left on-site, Alternative 4 meets all six requirements for containment of soils and thus, complies with cleanup standards. Redevelopment of the Site following implementation of Alternative 4 would require excavation of primarily shallow soil (typically less than 1 foot deep) with relatively low concentrations of indicator hazardous substances. The integration of the redevelopment for Alternative 4 would be significantly less complex, when compared to Alternatives 1 and 2, and therefore, the limited excavation which may be required during redevelopment could be managed more easily with institutional controls.

Compliance with Applicable State and Federal Laws

All cleanup action alternatives for upland soils would comply with ARARs as defined in Section 7.0. Compliance with permit requirements would be required to meet this threshold requirement.

Provision for Compliance Monitoring

All of the cleanup action alternatives for upland soils would provide for compliance monitoring in accordance with WAC 173-340-410. Monitoring would be conducted during construction under all alternatives to confirm that human health and the environment are adequately protected. Institutional controls and long-term monitoring would be implemented as part of all of the alternatives since all of the alternatives would leave residual soil contamination to various degrees. All of the alternatives would be subject to periodic reviews by Ecology per WAC 173-340-420 to ensure that the remedy remains protective of human health and the environment. For all four alternatives, groundwater quality monitoring would be conducted to confirm that groundwater cleanup standards are achieved as specified in Section 9.3.

10.1.2 Other MTCA Requirements

This section provides an evaluation of each alternative against the other MTCA requirements.

Use of Permanent Solutions to the Maximum Extent Practicable

As described in Section 8.2.1, MTCA requires that cleanup actions be permanent to the maximum extent practicable, and identifies a number of criteria to evaluate whether this requirement is achieved. Evaluation of the practicability of a given alternative is based on the comparative evaluation that costs are disproportionate to benefits if the incremental costs of the alternative over that of a lower cost alternative exceed the incremental degree of benefits achieved by the alternative over that of the other lower cost alternative.

If the incremental cost is determined to be substantial and disproportionate to the incremental increase in environmental benefit, the cleanup alternative is considered impracticable and eliminated from further consideration. Alternative 3 provides the most permanent remedy (in terms of composite/combined overall weighted benefit), since most of the soil containing hazardous substances exceeding cleanup levels would be removed from the Site and the remaining soils would be subject to institutional controls and long-term monitoring.

Alternatives 1, 2, 3 and 4 would require institutional controls and long-term monitoring since upland soils containing hazardous substances exceeding PCLs would remain on-site beneath an engineered cap. As described in Section 10.1.3, a DCA for upland cleanup action alternatives was performed to compare Alternatives 1, 2 and 4 to Alternative 3 (baseline) to evaluate whether the incremental costs of Alternative 3 over Alternatives 1, 2 or 4 exceed the incremental degree of benefits. The cost to benefit analysis is used to assess whether a particular alternative is “permanent to the maximum extent practicable”. The comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgment. In particular, the department has the discretion to favor or disfavor qualitative benefits and use that information in selecting a cleanup action per WAC 173-340-360(3)((e)(ii)(C).

Provision for Reasonable Restoration Time Frame

As described in Section 10.1.1, Alternative 3 would be protective of human health and the environment when the excavation is completed because the remaining minor portions of the Site containing soils with indicator hazardous substance concentrations above PCLs would be contained and could be managed effectively through the use of institutional controls during localized construction activities or redevelopment. As such, Alternative 3 would provide for a reasonable restoration time when considering the factors specified in WAC 173-340-360(4)(b).

Alternative 4 would be protective of human health and the environment when the excavation is completed because the remaining portions of the Site containing soils with indicator hazardous substance concentrations above PCLs would be contained and could be managed reasonably through the use of institutional controls during localized construction activities or redevelopment.

Because of the magnitude of the potential modifications to these alternatives during redevelopment and the uncertainty regarding the timing for redevelopment, the restoration time under Alternatives 1 and 2 would be either undetermined or subsequent to Site redevelopment. The restoration timeframe would depend upon re-establishment of containment or off-site disposal of contaminated soil disturbed during redevelopment implementation.

10.1.3 Disproportionate Cost Analysis (DCA)

As indicated in Section 8.2 and discussed above, the MTCA DCA is used to evaluate which of the cleanup action alternatives that meet the threshold requirements are permanent to the maximum extent practicable. This analysis involves comparing the costs and benefits of the alternatives and selecting the most permanent alternative whose incremental costs are not disproportionate to the incremental benefits. Costs are disproportionate to benefits if the incremental cost of the more permanent alternative exceeds the incremental benefits achieved by the lower cost alternative [WAC 173-340-360(3)(e)(i)]. Alternatives that exhibit disproportionate costs are considered “impracticable.” Where the benefits of two alternatives are equivalent, MTCA specifies that Ecology select the least costly alternative [WAC 173-340-360(e)(ii)(C)]. The DCA is performed in the following sections, using the information presented in Section 10.1.2. The alternatives are first compared to the most permanent cleanup alternative and the benefits of each alternative are ranked under the criteria of the DCA [WAC 173-340-360(f)] identified in Section 8.3. The costs are then compared to these benefits and cost-benefit ratios are calculated. The cost-benefit ratios are compared among the alternatives to identify which alternative is permanent to the maximum extent practicable.

A relative numerical score for each alternative was determined by assigning a value (i.e., raw score) on a scale from 1 to 10, where 10 is the highest benefit/value, for each criterion, multiplying each value by a criterion-specific weighting factor specified in Section 8.3, and summing the weighted scores to determine an overall weighted benefit score for each alternative. Assignment of scores was based on quantitative and qualitative information using best professional judgment. Ecology, however, has the discretion to favor or disfavor qualitative benefits and use that information in selecting a cleanup action per WAC 173-340-360(3)(e)(C). Table 10-1 summarizes the result of the DCA along with evaluation of MTCA threshold and restoration timeframe requirements.

Once the overall weighted benefit scores were established, the cost to benefit ratio was determined for each alternative by dividing the cost of the alternative by the calculated overall weighted benefit score. The alternative with the lowest cost to benefit score is the alternative that is “permanent to the maximum extent practicable”. Based on this analysis, Alternative 4 was determined to be “permanent to the maximum extent practicable”.

Each criterion in the DCA is further discussed below.

Protectiveness

The overall protectiveness of Alternative 3 is high because Site risks are primarily eliminated by the mass-removal and off-site disposal of almost all contaminated soil from the Site, and containment of a small amount of contaminated soil within the West Marine View Drive ROW.

The overall protectiveness of Alternatives 1 and 2 is lower than Alternatives 3 and 4 because contaminated soil would be contained on-site in close proximity to Puget Sound, and potential future Site use may conflict with maintenance of the engineered caps. Moreover, the demolition of existing buildings, new construction of foundations and infrastructure, and establishment of future site grades associated with redevelopment would be less compatible with containing a large amount of contaminated soil at the Site, and would increase the risk of exposure to soil during disturbance and relocation of contaminated soil during redevelopment construction.

The overall protectiveness of Alternative 4 is fairly high because Alternative 4 removes approximately 79 percent of the contaminated soil above PCLs, including all of the soil in close proximity of Puget Sound and the soil with the highest contamination levels located within the Everett Shipyard operational yard. The soil that would remain on the Site would be primarily contained beneath buildings, with some soil containing relatively low concentrations of cPAHs remaining beneath engineered covers consisting of asphalt-capped areas. The volume of residual contaminated soils above PCLs and the contaminant mass within the soil that would potentially be disturbed during redevelopment would be significantly less than under Alternatives 1 and 2. These risks could effectively be managed with institutional controls.

Alternative 1 is ranked with the lowest raw score for protectiveness, with an assigned raw score value of 1 (i.e., 90 percent below Alternative 3). Alternative 2 is ranked with a raw score value of 2 (i.e., 80 percent below Alternative 3), because it relies on institutional controls and long-term compliance monitoring, but to a lesser degree than Alternative 1. Alternative 4 is assigned a raw score value of 8 (i.e., 21 percent below Alternative 3) because it removes significantly more contaminant mass than both Alternatives 1 and 2, but not as much as Alternative 3. Alternative 3 was assigned a raw score value of 10 because it is the most protective alternative considered.

Permanence

The evaluation of permanence considers the degree to which alternatives permanently reduce the toxicity, mobility or mass of hazardous substances. Each alternative relies on excavation, offsite disposal and engineered caps to reduce the contaminant mobility and mass at the Site. None of the alternatives reduce toxicity. To assess the degree of permanence, the total contaminant mass at the Site and the contaminant mass of key indicator hazardous substances (i.e., arsenic, lead, petroleum hydrocarbons, cPAHs and PCBs) removed for each alternative was estimated. The approach used to estimate total contaminant mass and the mass removed by each alternative is described in Appendix I. The percent of contaminant mass removal for each key indicator hazardous substances is summarized in Table 10-1.

Alternative 3 is the most permanent cleanup action alternative for upland soils and is assigned a raw score of 10. Alternative 1 is assigned a raw score of 1 because it does not remove a significant amount of contaminant mass. Alternative 2 is assigned a ranking score of 5 since it excavates about 50 percent of the area impacted with soils above PCLs at the Site and removes at least 50 percent of the contaminant mass. Alternative 4 was assigned a raw score of 9 based on excavation area and contaminant mass removal estimates.

Effectiveness over the Long Term

The long-term effectiveness of Alternatives 1 and 2 is lower than that for Alternatives 3 and 4 due to similar reasons described under the "Permanence" criterion. The planned redevelopment of the Site may include new infrastructure, buildings, and potentially significant changes to existing grades. As a result, the engineered caps proposed for these alternatives including Alternative 4 may require reconfiguration to be maintained in the long term, and a significant amount of soils above PCLs may have to be excavated and disposed of off-site during redevelopment to accommodate new roads, utilities, building foundations, and Site grades.

As such, similar raw scores described in "Permanence" are assigned to alternative 1 and 2 based on the volume of excavated soil and the contaminant mass removed from the Site.

Management of Short-Term Risks

Both capping and excavation are well established technologies and the short-term risks associated with Alternatives 1 through 4 are primarily related to general earthwork and typical/ordinary construction activities. Alternatives that minimize construction effort, handling of contaminated soil by site workers, and minimize import and export of materials to and from the site have lower short-term risks. Therefore, Alternative 1 has the lowest short-term risks and is assigned a raw score of 10. Alternative 2 is assigned a raw score of 9. Alternative 3, which involves increased risk to construction workers associated with building demolitions and hazardous material abatement, is assigned a raw score of 7, and Alternative 4 is assigned an intermediate score of 8. This category received the lowest weighting factor (10 percent) because short term risks can be managed through appropriate design and administrative controls such as implementing a Site-specific health and safety plan during construction work.

Technical and Administrative Implementability

Both capping and excavation would be implemented for all four alternatives. These are well established technologies and would be easily implemented using common construction techniques and equipment. These technologies by themselves do not present any significant permitting or other administrative implementability issues. Alternative 3, is more technically complex compared to the other alternatives because of the building demolition work. Alternative 3, however, presents the least amount of administrative effort due to fewer changes which may be required during Site redevelopment.

Alternative 3 is assigned the highest raw score of 10 for this category because it involves the least amount of administrative effort to manage the institutional controls. Alternative 4 is assigned the second highest score of 9 because it would require a minimal amount of potential rework if the site were to be redeveloped. Alternatives 1 and 2 are assigned the lowest scores for this category, raw scores of 7 and 8, respectively, because these alternatives would require the greatest amount of administrative effort during potential site redevelopment (e.g., implementation of Soil Management Plan, modifications to remedy, etc). While the raw scores assigned to this category are primarily driven by administrative effort and complexities associated with potential changes to the Site during future site redevelopment, the building demolitions associated with implementing Alternative 3 add technical complexity, which would not be applicable to Alternatives 1, 2, and 4.

Considerations of Public Concerns

Given the Public's preference for more permanent and protective cleanup alternative (source removal from the site) over capping, a higher raw score is assigned to Alternative 3 than Alternatives 1, 2 and 4. Alternative 3 is assigned the highest raw score for this category of 10, followed by Alternative 4 with a raw score of 8 followed by Alternative 2 with a raw score of 4 and Alternative 1 with a raw score of 4.

Cost

The cost estimates are used as the cost basis for the DCA presented in this section. The cost estimates presented in this feasibility study are considered order of magnitude (i.e., the estimated costs are expected to be within -30 to +50 percent of actual costs of the completed project). The primary use of these estimates is to allow comparison between alternatives during the selection process, not for establishing project budgets. Given the similarity of the components of the upland alternatives, the actual costs are likely to be proportionally higher or lower for all of the alternatives and relative costs are not anticipated to change significantly.

For fair cost comparison, capital costs are assumed to be entirely expended in year zero (or 2010 yr), even though some alternatives may take longer to implement than others. Because expenditures occur over different periods of time in some of the alternatives, O&M and periodic costs are discounted to a common base year (i.e., year "zero") and added to the capital costs to obtain the total present worth of each alternative. With present worth analysis, alternatives can be compared on the basis of a single value. Following USEPA guidelines (USEPA 2000), the appropriate real discount rate to the Subject site based on 30+ years of periodic monitoring expenditures is set at 2.7 percent per Office of Management and Budget[6]. Present worth costs are used to compare alternatives.

a. Calculation of cleanup cost <u>not</u> considering the future contingency capital cleanup cost due to future site redevelopment
For the cost estimation not considering the future contingency cleanup cost due to future site redevelopment, refer to Tables 10-2 through 10-5 where a detailed breakdown/rationale of costs for each of the four alternatives is provided. As shown in these tables, the approximate cleanup costs for Alternatives 1 through 4 are $1.8 million, $2.7 million, $5.4 million, and $3.8 million (present worth),

[6] http://www.whitehouse.gov/omb/circulars_a094_a94_appx-c/

respectively. Costs were not assigned a weighting factor like the other criteria. The DCA presented in Table 10-1 calculates a cost to benefit ratio by dividing the estimated costs by the overall weighted benefit score.

b. Calculation of future contingency capital cleanup cost due to future site redevelopment in year 2020

As Alternatives 1, 2, and 4 would leave significant to minor amounts of impacted soil in place, proper soil management plans and follow-up cleanup would be needed to require excavation/removal, building demolition (if found to be necessary), offsite disposal of additional impacted soil to accommodate utilities, and building foundations to maintain protectiveness of human health and the environment. As such future capital cleanup cost as a contingency would be necessary in the event that subsurface construction activities (or redevelopment of site) occur at the site. Future management of contaminated soil could result in higher future redevelopment project costs depending upon each cleanup alternatives.

Future contingency cleanup costs were estimated under the assumption that there would be a comprehensive site redevelopment/construction in 2020. A detailed breakdown/rationale of calculating future contingency cleanup costs for each alternative is provided in Table 10-6. As shown in this table, the approximate future contingency capital cleanup costs for Alternatives 1, 2 and 4 are $3.3 million, $1.8 million, and $0.76 million (present worth) due to an extensive site redevelopment, respectively.

10.1.4 Conclusions of Disproportionate Cost Analysis

Table 10-1 summarize the results of the DCA using Alternative 3 as the baseline remedy under two assumptions described in 10.1.3. The relative benefit ranking of each alternative against the six MTCA evaluation criteria and cost/benefit ratio are presented in Table 10-1. The preferred alternative is presented in Section 11.0, and is assembled from the alternative selected as permanent to the maximum extent practicable for the upland areas. Consistent with MTCA requirements, the overall weighted benefit score and cost of Alternatives 1, 2 and 4 are compared to the scores and costs for the most permanent alternative, Alternative 3. Alternative 3 makes the greatest use of high-preference technologies and represents the most permanent remedial alternative evaluated in this FS. As such, Alternative 3 represents the benchmark against which the incremental costs and benefits of the other alternatives are evaluated.

The overall weighted score for Alternative 3 was the highest, 9.7 (out of 10). Alternative 1 received an overall weighted score of 2.8 points. Alternative 2 received an overall weighted score of 4.7 points. Alternative 4 received an overall weighted score of 8.3 points.

Alternative 3 receives the highest overall weighted benefit score, because this remedy uses the most permanent remedial technologies of those evaluated for this FS and removes the highest amount of contaminated soil, thereby alleviating concerns associated with residual contaminated soil during site redevelopment. Alternative 3 also receives high benefit rankings for overall protectiveness, permanence, long-term effectiveness, and implementability. The Alternative 3 overall weighted benefit score is significantly higher than the scores for Alternatives 1 and 2, which received overall weighted scores of 2.8 and 4.7, respectively. The significantly lower overall weighted benefit scores for Alternatives 1 and 2 result from higher amounts of soils above PCLs remaining on-site and larger areal extent of engineered caps. Because future redevelopment may require removal of the engineered caps relied upon in Alternatives 1 and 2 for containment of contaminated soil and a significant amount of the contaminated soil may require removal, as shown in Tables 10-1 and 10-6, these alternatives receive very low benefit scores for overall protectiveness, permanence, and long-term effectiveness. In contrast, the Alternative 3 overall weighted benefit score is only somewhat higher than Alternative 4. Alternative 4 benefit scores were better than Alternatives 1 and 2 overall weighted benefit scores because this alternative provides a more permanent and effective solution that can more easily incorporate planned redevelopment at the Site.

As shown in Table 10-1, the ratio of the estimated cleanup cost to the overall weighted benefit score is used to assist in evaluating which of the upland alternatives is permanent to the maximum extent practicable. The most cost-effective alternative is the alternative with the lowest calculated cost/benefit ratio. As shown in Table 10-1, Alternative 4 (the second most permanent alternative) has the lowest cost/benefit ratio of “458.” As such, Alternative 4 is found to be more cost effective than Alternatives 1, 2, and 3. When compared to Alternative 4, Alternative 3 would cost 42% more ($1.6 million) and would remove about 1 percent more mass of the most toxic constituents at the Site (combined mass of arsenic, lead, cPAHs and PCBs, petroleum). The incremental cost for Alternative 3 is considered disproportionate to the incremental degree of benefit achieved over that of Alternative 4. The disproportionate costs are mostly attributed to the increased costs associated with demolition of the buildings at the Site, which would be required to excavate the contaminated soil beneath these buildings. As a result, Alternatives 1, 2 and 3 were determined to be “impracticable” and were discarded from further consideration. Alternative 4 is the MTCA preferred remedy for the upland portion of the Site based on the DCA.

10.2 EVALUATION OF MARINE SEDIMENT ALTERNATIVES

This section evaluates the cleanup action alternatives for marine sediment against the threshold requirements and other MTCA requirements.

10.2.1 Threshold Requirements

The two marine sediment cleanup action alternatives identified in Section 9.4 meet the minimum threshold requirements for cleanup actions under MTCA. This section provides an evaluation of each alternative against each threshold requirement.

Protection of Human Health and the Environment

Both of the marine sediment cleanup action alternatives would be highly protective of human health and the environment, as they include dredging and/or capping. For Alternative 1, capping relies on adequate cap placement and maintenance for protection. The capped portion would provide moderate to high protection, depending upon placement extent, cap design, and long-term maintenance. For both alternatives, dredging relies upon effective removal of sediment exceeding CLs and would provide a high level of protection.

Both alternatives are expected to lead to improvement in marine habitat, through removal or containment of contaminated sediments as well as removal of the marine railway.

Compliance with Cleanup Standards

Each of the marine sediment alternatives is expected to comply with the cleanup standards that are discussed in Section 6.0. Alternative 1 would use a combination of dredging in accessible areas and capping in less accessible areas to either remove or contain sediments at concentrations that exceed the CLs. Alternative 2 would remove all sediments at concentrations that exceed CLs.

Compliance with Applicable State and Federal Laws

Both marine sediment alternatives would comply with ARARs as defined in Section 7.0.

Provision of Compliance Monitoring

Both alternatives provide for confirmation sampling of the dredged area to document removal of sediment areas where concentrations exceed CLs. Alternative 1 includes long-term monitoring for the capped areas including visual inspection and periodic porewater sampling following implementation of the remedial action.

10.2.2 Other MTCA Requirements

This section provides an evaluation of each alternative against the other MTCA requirements.

Use of Permanent Solutions to the Maximum Extent Practicable

Alternative 2 provides the most permanent remedy because all sediments containing hazardous substances at concentrations above cleanup levels would be removed and no institutional controls or long-term monitoring would be required. Alternative 1 would require institutional controls and long-term monitoring since some of the sediment that exceeds cleanup levels would remain in the north marina beneath a sediment cap.

Provide for Reasonable Restoration Time Frame

Both alternatives would be protective of human health and the environment at the completion of the dredging and/or capping. For Alternative 1, institutional controls and long-term monitoring would be required. For costing purposes, a period of 20 years was assumed for periodic long-term monitoring. Monitoring and institutional controls would be required to ensure integrity of the sediment cap and continued protection of human health and the environment.

10.2.3 Disproportionate Cost Analysis

No disproportionate cost analysis was conducted for the marine sediment alternatives because the costs for the two alternatives are of the same order of magnitude and the costs for the more permanent alternative do not appear to be disproportionate to the incremental benefit achieved.

Although no disproportionate cost analysis was performed, the marine sediment alternatives are evaluated against each of the cost analysis criteria as described in the subsections below for completeness.

Protectiveness

Both of the marine sediment cleanup action alternatives would be protective of human health and the environment because each prevents human and ecological exposure to contaminated sediment by removing or isolating the contamination. Alternative 2 is considered most protective because it removes all of the sediments with hazardous substance concentrations above CLs and does not rely on institutional controls and long-term monitoring to ensure integrity, and thus protectiveness, of the capped area that is part of Alternative 1.

Permanence

Alternatives 1 and 2 do not permanently reduce the toxicity through destruction or treatment of the indicator hazardous substances contained in sediment. These alternatives rely instead on reduction in mobility and mass through containment at the Site and/or off-site disposal. Alternative 2 is more permanent because it removes sediment with indicator hazardous substance concentrations that exceed CLs from the Site.

Effectiveness over the Long Term

Alternative 2 is superior to Alternative 1 in the long term as it does not require long-term monitoring and removes sediment with contamination above CLs. However, evidence of contamination in the dual bulkhead sediments in the Outfall A/Travel Lift area raises questions about the degree of source control in the adjacent uplands areas North and West of the Site. Several outfalls potentially serving these uplands areas discharge into the bulkhead sediments. The configuration of the piping connected to these outfalls, the areas drained by the outfalls, and the historic land use and current conditions in the areas potentially drained do not seem to be well-documented. The potential for ongoing releases of contaminants from one or more of these outfalls is uncertain. Future releases in the dual bulkhead area could compromise the long-term effectiveness of any remedial approach implemented in this area.

Management of Short Term Risks

The two alternatives are generally comparable in terms of short-term risks.

Technical and Administrative Implementability

Alternative 1 is slightly inferior to Alternative 2 because it leaves contaminants above CLs on-site, requiring institutional controls and long-term monitoring.

Cost

Detailed cost estimates for marine sediment Alternatives 1 and 2 are provided in Tables 10-7 and 10-8. The cost estimates presented in this feasibility study are considered order of magnitude (i.e., the estimated costs are expected to be within -30 to +50 percent of actual costs of the completed project). The primary use of these estimates is to allow comparison between alternatives during the selection process, not for establishing project budgets. Given the similarity of the components of the marine sediment alternatives, the actual costs are likely to be proportionally higher or lower for all of the alternatives and relative costs are not likely to change significantly.

The estimated total project present worth cost for Alternative 1 including targeted dredging, capping, and long-term monitoring is approximately \$2.0 million. The capital cost (equivalent to present worth for this alternative) for Alternative 2 for mass dredging is \$2.0 million. Alternative 2 does not require long-term monitoring.

11.0 PREFERRED CLEANUP ACTION

This section presents the rationale for the selection of the preferred cleanup action alternatives for upland soils and marine sediments at the Site.

11.1 PREFERRED UPLAND CLEANUP ACTION ALTERNATIVE

Based on the evaluations in Section 10.0, the preferred upland cleanup action is Alternative 4, which includes:

- Bulk excavation of all contaminated soil in close proximity of the Puget Sound,
- Excavation of all contaminated soil within the former Everett Shipyard primary operational yard and beneath Everett Engineering Buildings 7 and 9,
- Containment of remaining contaminated soil through use of engineered caps (i.e., beneath existing structures and pavement),
- Institutional controls; and
- Groundwater and long-term monitoring.

Alternative 4 meets the threshold requirements and other MTCA requirements and is the remedy that is permanent to the maximum extent practicable as determined by the DCA. Based on the cost to benefit analysis, Alternative 3 is impracticable because the costs for this alternative are disproportionate to the incremental benefits.

The preferred remedy would permanently remove the significant amount of soil above PCLs from the uplands Site. For the indicator hazardous substances the estimated contaminant mass reduction following implementation of Alternative 4 would be as follows: approximately 96 % of the arsenic, approximately 93 % of the lead, approximately 90 % of the cPAHs, 99% of TPH, and approximately 99 % of the PCBs. This results in an approximate 98% overall reduction of indicator hazardous substances mass. The estimated contaminant mass removed would exceed the overall percentage of contaminated soil removed because the Alternative 4 excavation focuses on removing soils in areas with the highest concentrations of indicator hazardous substances.

The post-excavation residual upland soil contamination would be predominately located beneath buildings, where the removal costs would be disproportionately high. The concentration of contaminants remaining beneath the paved areas is relatively low, and the cost to remove this soil would be disproportionately high considering the low contaminant mass (2% of indicator hazardous substance mass) that would remain under Alternative 4. The residual upland soil contamination would be covered by an engineered cap (i.e., existing buildings if any or pavement) and would not present an unacceptable risk to human health and the environment. Residual upland soil contamination beneath buildings and pavement following remedial construction would be addressed through institutional controls, including deed restrictions and a Soil/Groundwater Management Plan. The Soil/Groundwater Management Plan would document procedures, including those listed in Section 9.3, to be implemented in the event that the integrity of the engineered cap is compromised and contaminated soil becomes exposed (e.g., contaminated soil under buildings or other capping features becomes exposed during future Site activities). Implementation of the Soil/Groundwater Management Plan will be considered part of the cleanup action if the remaining structures are demolished prior to the beginning of major upland remedial construction.

11.2 PREFERRED MARINE SEDIMENT CLEANUP ACTIONALTERNATIVE

Based on the evaluations in Section 10.0, the preferred marine sediment cleanup action is Alternative 2, Mass Dredging. The two alternatives evaluated in Section 10.0 are generally comparable in terms of cost. Alternative 2, however, is somewhat more permanent than Alternative 1. Dredging the entire area where sediment concentrations exceed the CLs would also be the most protective, as it would remove the contaminated sediment, eliminate potential ecological or human contact with contaminated sediment and the need for long-term monitoring.

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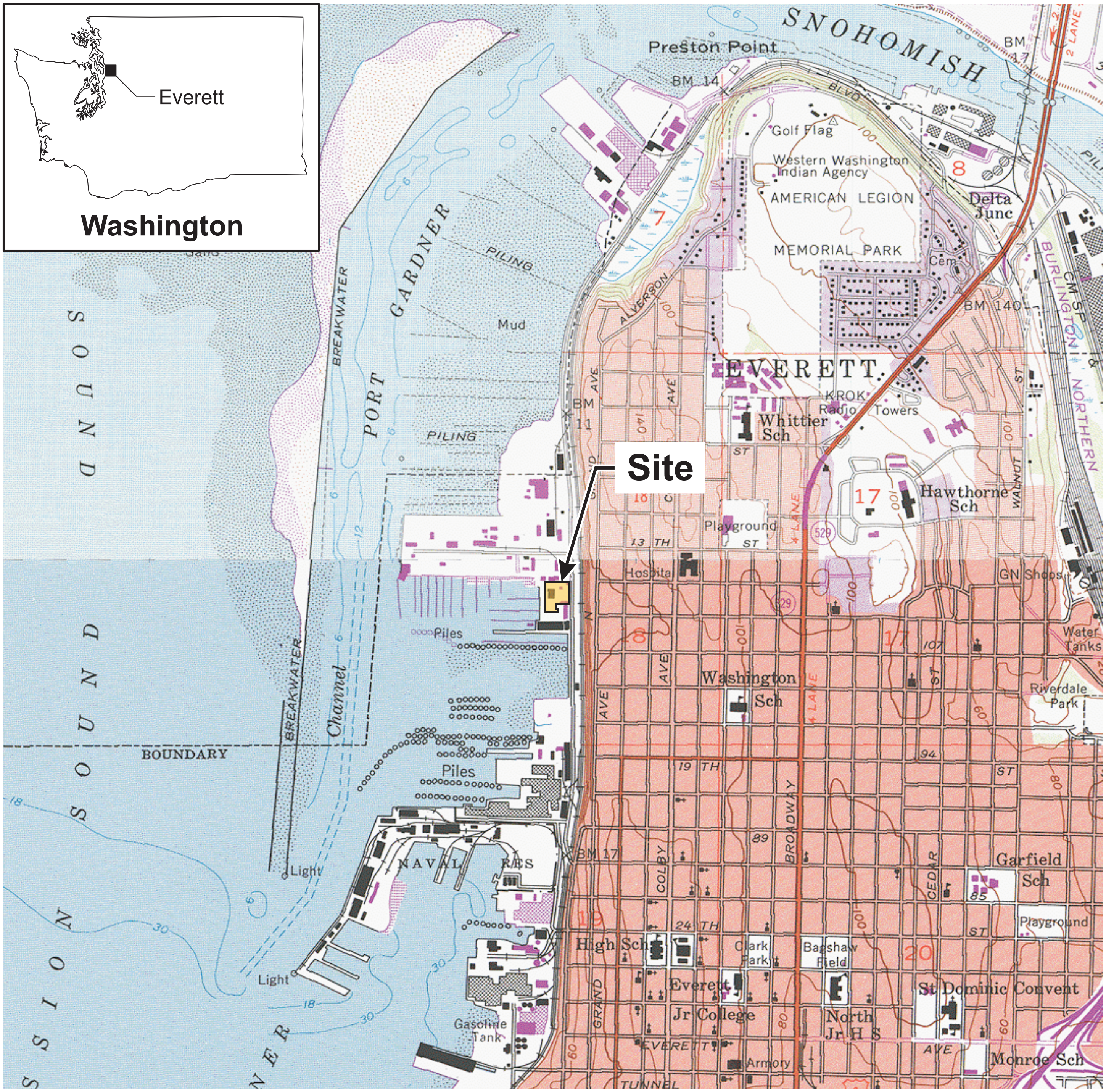

SOURCE: 7.5-minute USGS topographic quadrangles, Marysville and Everett, Washington

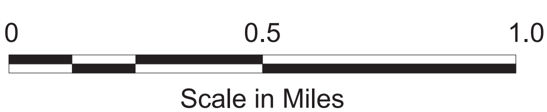

Figure 1-1
Site Location Map

Job No. 33761354

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Everett Shipyard
Everett, Washington
RI/FS

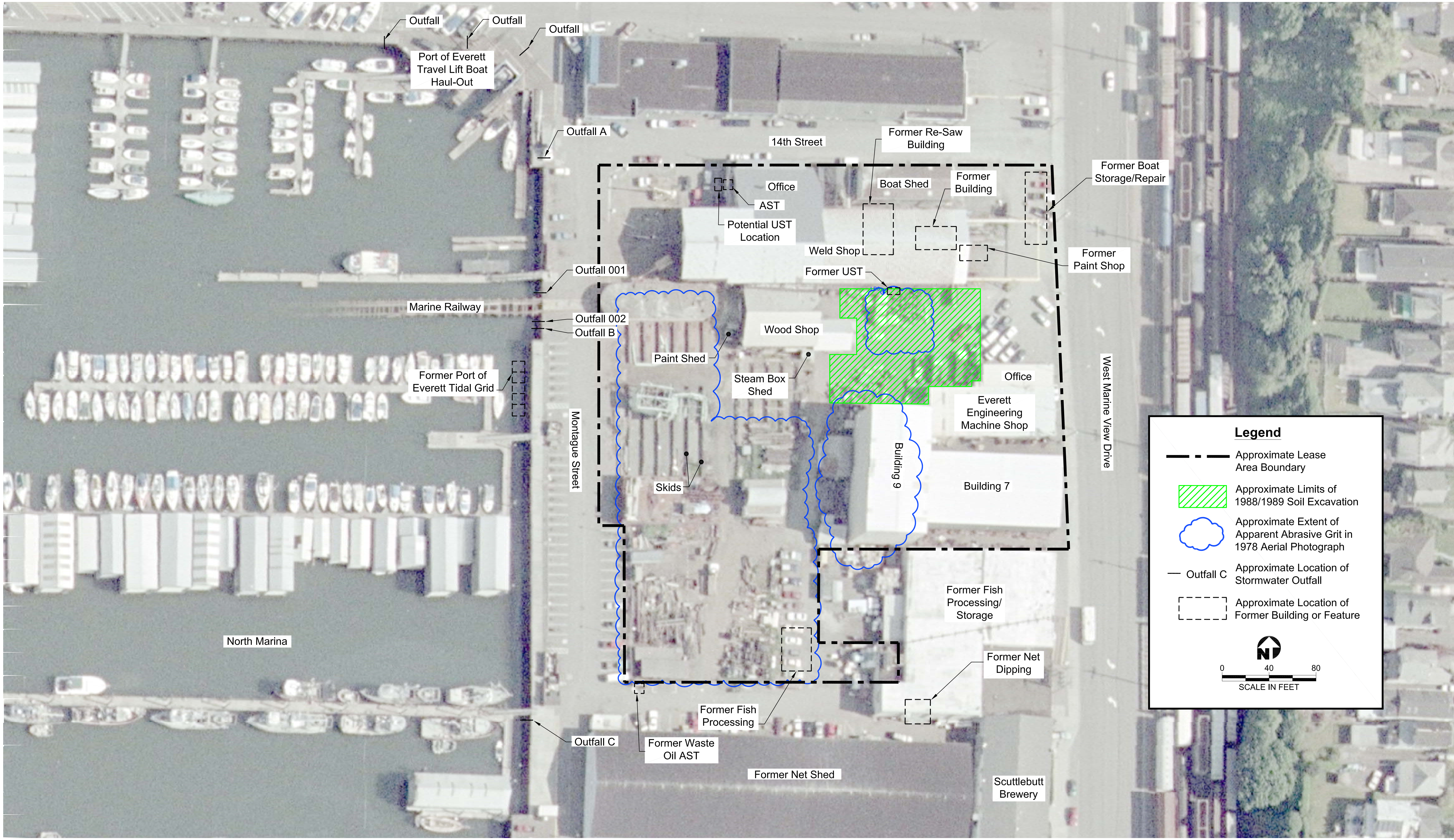

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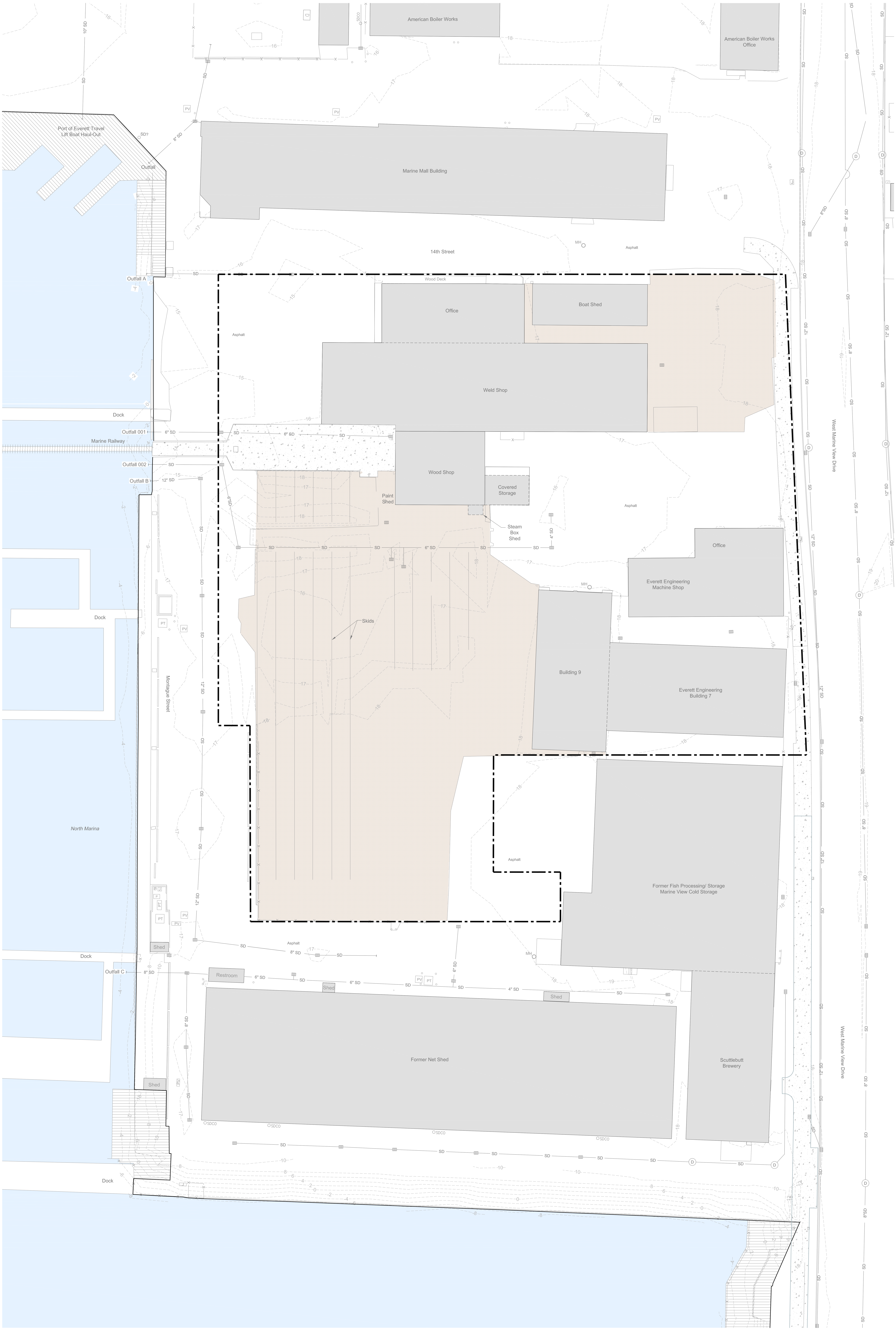
Figure 1-2
Site Plan
Everett Shipyard
Everett, Washington
RI/FS



Basemap provided by Port of Everett. Field observations did not confirm catch basin and outfall connections in some cases.

Legend

- Elevation Contour (Feet Above Mean Sea Level)
- Storm Drain
- Catch Basin
- Sanitary Sewer Manhole
- Approximate Lease Area Boundary
- Unpaved Areas
- Concrete

0 15 30
SCALE IN FEET

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URS

Figure 1-3
Site Plan and Stormwater Drainage Features

Everett Shipyard
Everett, Washington
RI/FS

Job No. 33761354

Figure 2-1
Upland Sampling Locations

URS

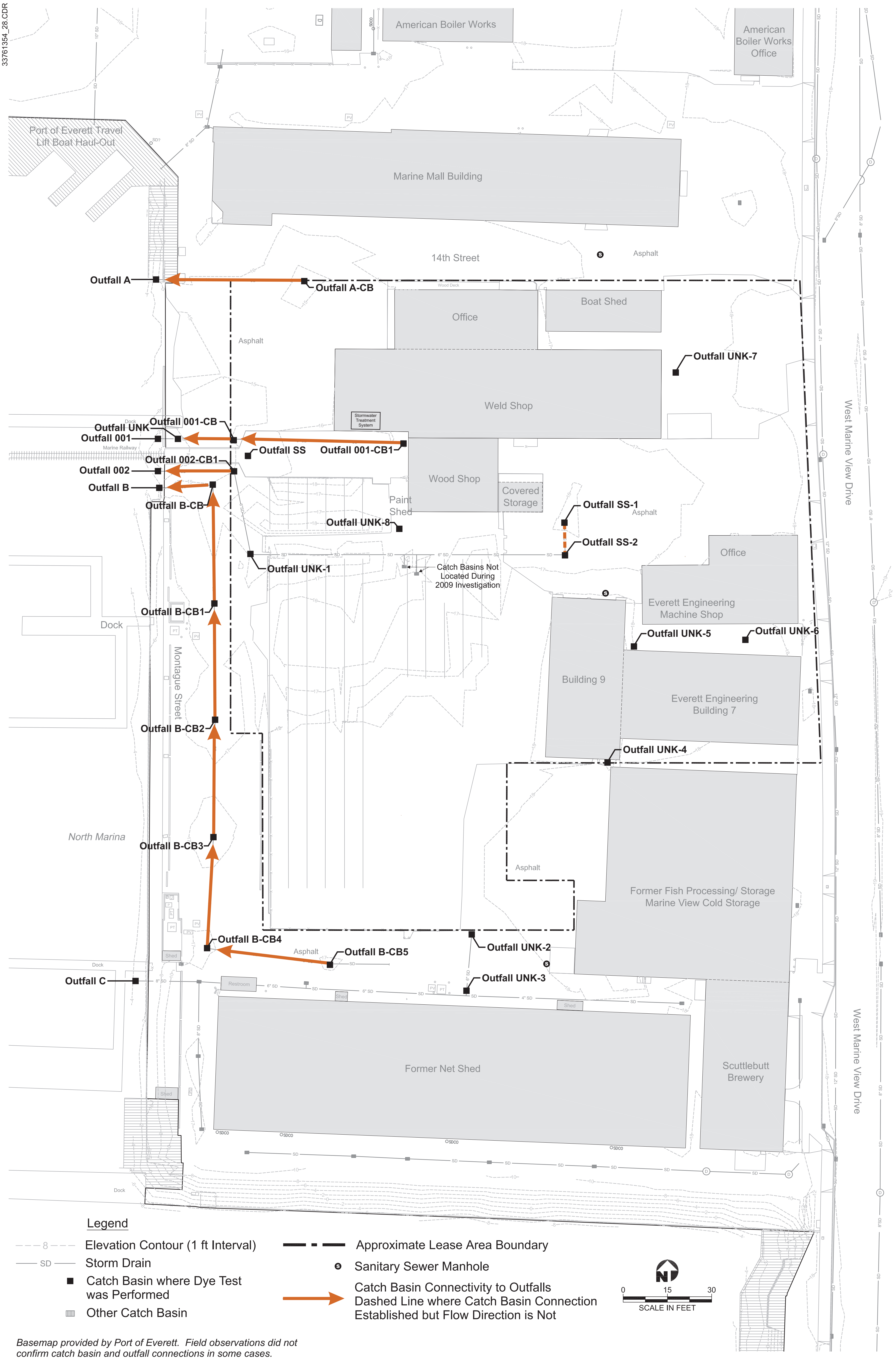
Everett Shipyard
Everett, Washington
RI/FS

Job No. 33761354

Figure 2-2
Marine Sediment Sampling Locations

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

- Elevation Contour (1 ft Interval)
- Storm Drain
- Catch Basin where Dye Test was Performed
- Other Catch Basin
- Approximate Lease Area Boundary
- Sanitary Sewer Manhole
- Catch Basin Connectivity to Outfalls; Dashed Line where Catch Basin Connection Established but Flow Direction is Not

0 15 30
SCALE IN FEET

Basemap provided by Port of Everett. Field observations did not confirm catch basin and outfall connections in some cases.

Job No. 33761354

Figure 3-1
Catch Basin Flow Routing

URS

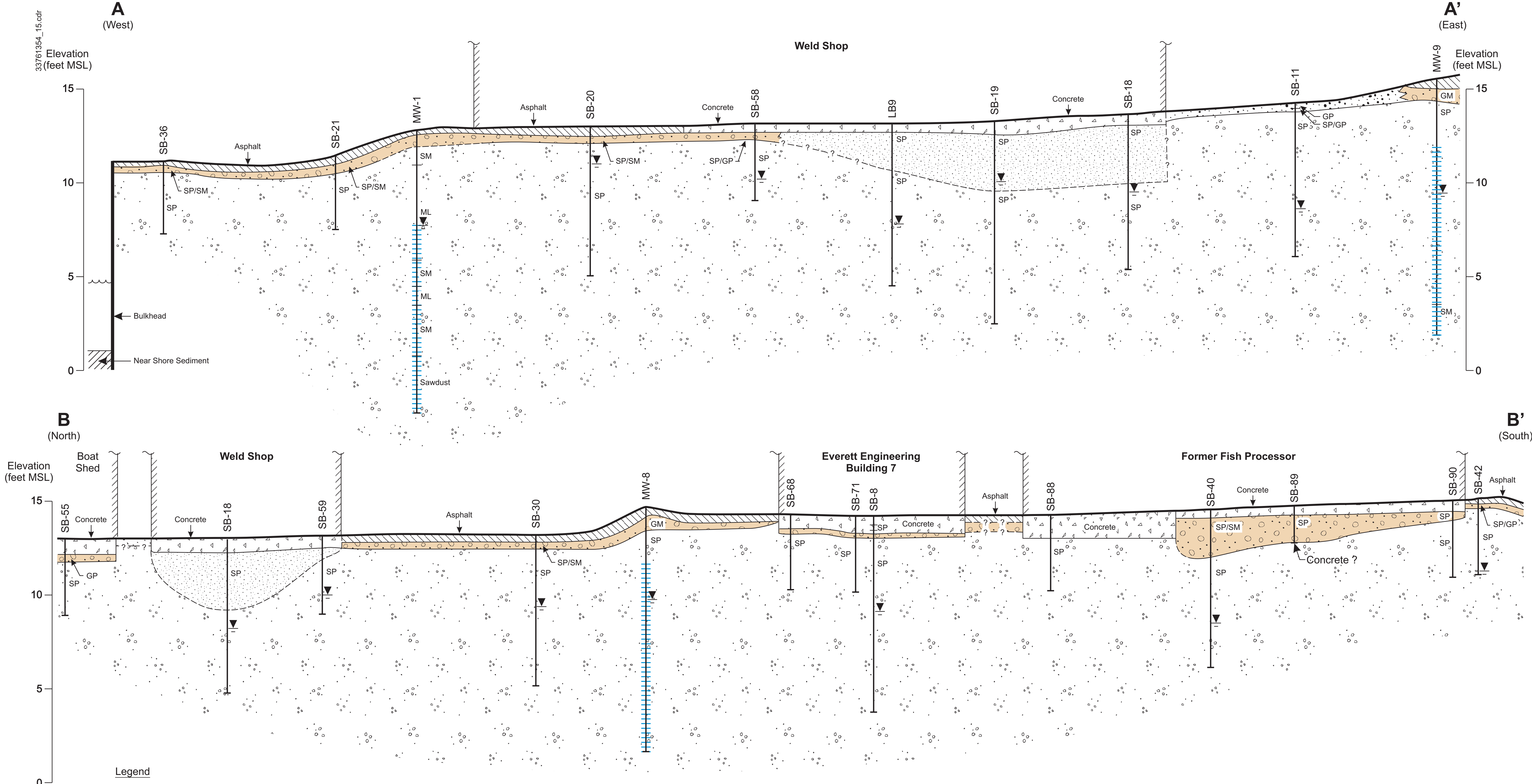
Everett Shipyard
Everett, Washington
RI/FS

Figure 3-2
Field Observations of Soil Impacts

Job No. 33761354

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

Surficial Fill	Organic soil or surface soils, brown or dark brown with some fine gravel and occasional black abrasive grit	
Concrete		
Asphalt		
Foundation Fill	Yellow/brown or tan clean sand, seen under concrete slab beneath weld shop	
Base Course	Brown or dark brown gravelly sand, typically under concrete or asphalt	
Hydraulic Fill	Above groundwater – brown sand with rust-colored mottling Below groundwater – gray or dark gray sand, frequently contains wood debris or shell fragments and sometimes is laminated, typically grades finer with depth	

Groundwater elevation at time of drilling

Contact between units, dashed where inferred

Well screen

Elevations in feet above mean sea level
NAVD88 vertical datum

0 30 60
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 6X

Figure 3-3
Cross Sections A-A' and B-B'

Job No. 33761354

URS

Everett Shipyard
Everett, Washington
RI/FS

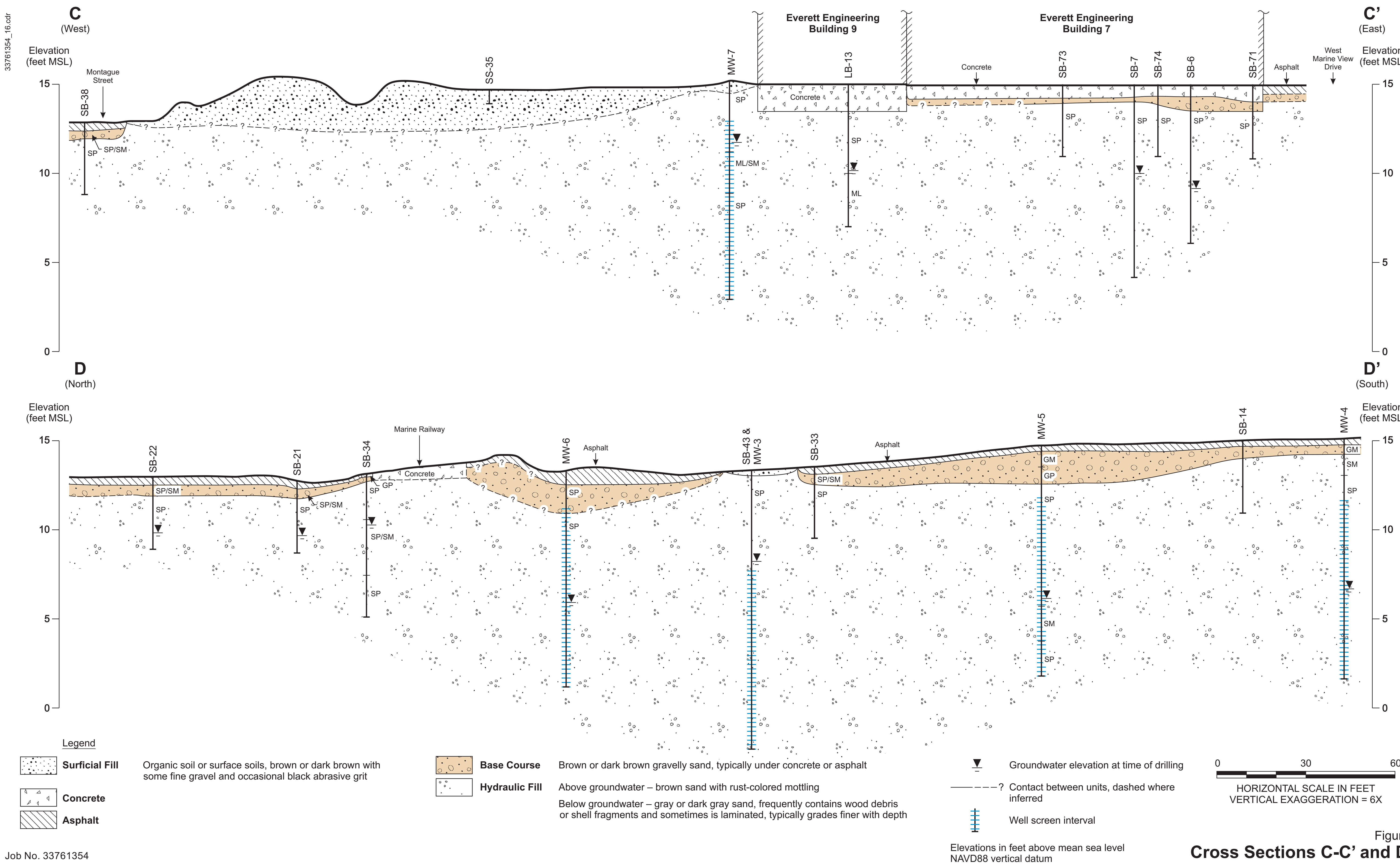
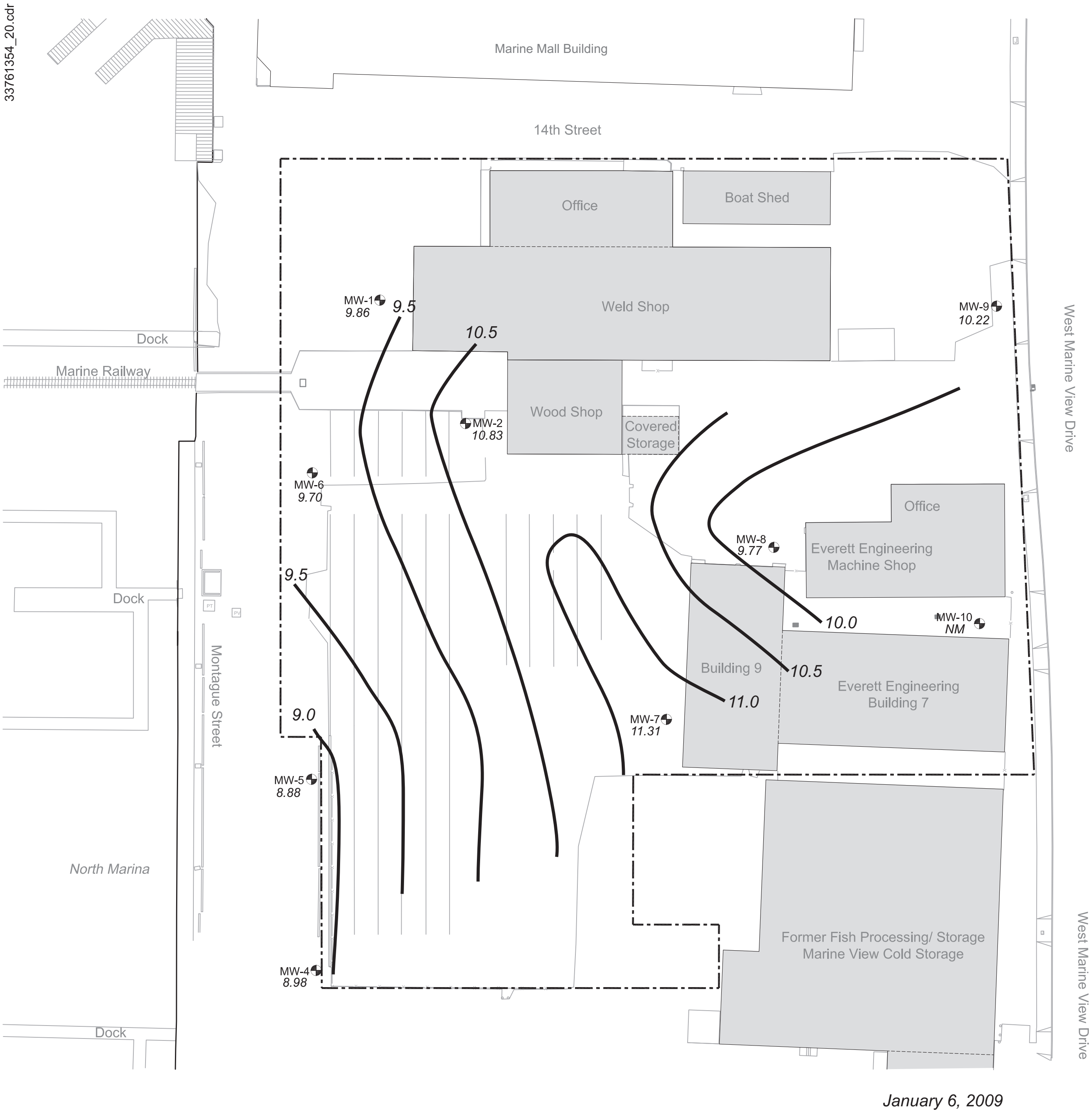


Figure 3-4
Cross Sections C-C' and D-D'

Job No. 33761354

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

Monitoring Well

9.0 Elevations in feet above mean sea level at approximately low tide

Groundwater elevation contours, dashed where inferred or uncertain

Approximate Lease Area Boundary

Basemap provided by Port of Everett.

Job No. 33761354

Figure 3-5a

January 2009 Groundwater Elevations

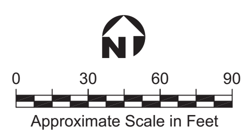
URS

Everett Shipyard
Everett, Washington
RI/FS

Legend

- Monitoring Well
- *9.0* Elevations in feet above mean sea level at approximately low tide
- Groundwater elevation contours, dashed where inferred or uncertain
- Approximate Lease Area Boundary

Basemap provided by Port of Everett.

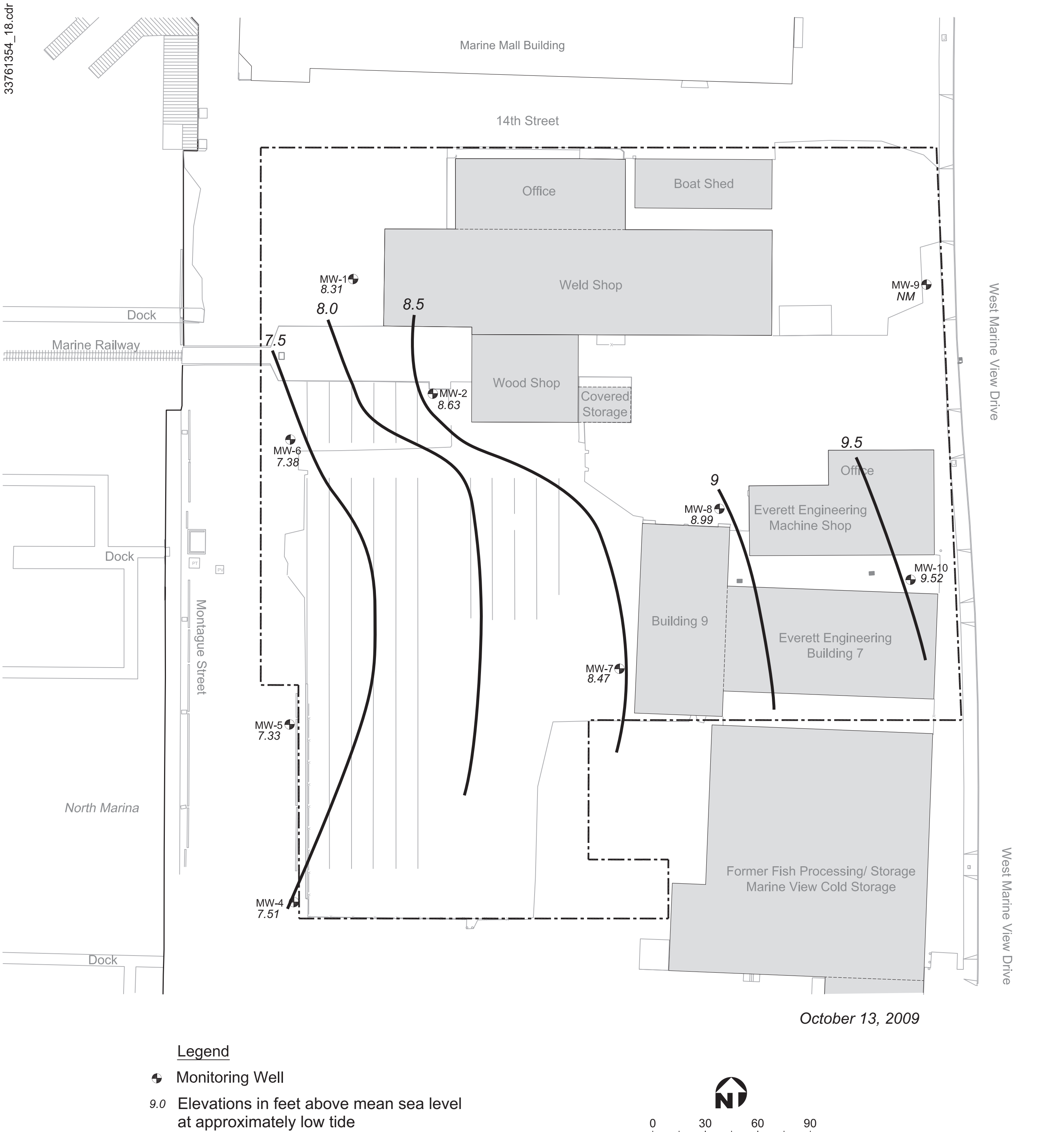


Job No. 33761354

Figure 3-5b
April 2009 Groundwater Elevations

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

- Monitoring Well
- 9.0 Elevations in feet above mean sea level at approximately low tide
- Groundwater elevation contours, dashed where inferred or uncertain
- Approximate Lease Area Boundary

Basemap provided by Port of Everett.

Figure 3-5c

October 2009 Groundwater Elevations

Job No. 33761354

URS

Everett Shipyard
Everett, Washington
RI/FS

Legend

- Elevation Contour
- Storm Drain
- Catch Basin
- Monitoring Well
- Soil Boring Sample
- Shallow Soil Sample
- Shallow Soil Sample/Hand Auger
- Approximate Lease Area Boundary
- 2008/2009 Soil Samples
- Historical Soil Samples

bgs below ground surface (see Table 2-2 for ground surface material)
NA Not analyzed
Bold Bold value indicates preliminary cleanup level (20 mg/kg for arsenic, 250 mg/kg for lead) exceeded.
U Compound was analyzed for but not detected above the reporting limit shown.
J Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
UJ Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Duplicate sample collected; highest concentration detected shown.
Not analyzed
Analyzed, does not exceed preliminary cleanup level
Surficial staining or abrasive grit noted and initial sample analyzed (1-1.5 feet bgs) did not exceed preliminary cleanup level

Sample Identification		
Depth (feet bgs)	Arsenic	Lead

units in milligrams per kilogram (mg/kg)

0 15 30
SCALE IN FEET

Basemap provided by Port of Everett. Field observations did not confirm catch basin and outfall connections in some cases.

Job No. 33761354

Figure 4-1
Extent of Arsenic and Lead Impacted Soil

URS

Everett Shipyard
Everett, Washington
RI/FS

Legend

- Elevation Contour
- Storm Drain
- Catch Basin
- Monitoring Well
- Soil Boring Sample
- Shallow Soil Sample
- Shallow Soil Sample/Hand Auger
- Approximate Lease Area Boundary
- 2008/2009 Soil Samples
- Historical Soil Samples

bgs	below ground surface (see Table 2-2 for ground surface material)
DRO	diesel-range hydrocarbons
ORO	oil-range hydrocarbons
Bold	Bold value indicates preliminary cleanup level (2,000 mg/kg) exceeded.
U	Compound was analyzed for but not detected above the reporting limit shown.
J	Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
*	Duplicate sample collected; highest concentration detected shown.
**	Chromatographic profile does not match the laboratory standard chromatogram.
	Not analyzed
	Analyzed, does not exceed preliminary cleanup level
	Surficial staining or abrasive grit noted and initial sample analyzed (1-1.5 feet bgs) did not exceed preliminary cleanup level

Sample Identification		
Depth (feet bgs)	DRO	ORO

units in milligrams per kilogram (mg/kg)
Cleanup level = 2,000 mg/kg for diesel-range and oil-range hydrocarbons.

0 15 30
SCALE IN FEET

Basemap provided by Port of Everett. Field observations did not confirm catch basin and outfall connections in some cases.

Job No. 33761354

Figure 4-2
Extent of Petroleum Hydrocarbon Impacted Soil

URS

Everett Shipyard
Everett, Washington
RI/FS

Job No. 33761354

Figure 4-3
Extent of cPAH Impacted Soil

URS

Everett Shipyard
Everett, Washington
RI/FS

Legend

- Elevation Contour
- Storm Drain
- Catch Basin
- Monitoring Well
- Soil Boring Sample
- Shallow Soil Sample
- Shallow Soil Sample/Hand Auger
- Approximate Lease Area Boundary
- 2008/2009 Soil Samples
- Historical Soil Samples

bgs	below ground surface (see Table 2-2 for ground surface material)
PCBs	polychlorinated biphenyls
Bold	Bold value indicates preliminary cleanup level (1,000 μg/kg) exceeded.
U	Compound was analyzed for but not detected above the reporting limit shown.
J	Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
*	Duplicate sample collected; highest concentration detected shown.
SS	sub-slab soil sample
ND	Not detected; PCBs were not detected above respective reporting limits.
	Not analyzed
	Analyzed, does not exceed preliminary cleanup level

units in micrograms per kilogram (μg/kg)

Basemap provided by Port of Everett. Field observations did not confirm catch basin and outfall connections in some cases.

Job No. 33761354

Figure 4-4
Extent of PCB Impacted Soil

URS

Everett Shipyard
Everett, Washington
RI/FS

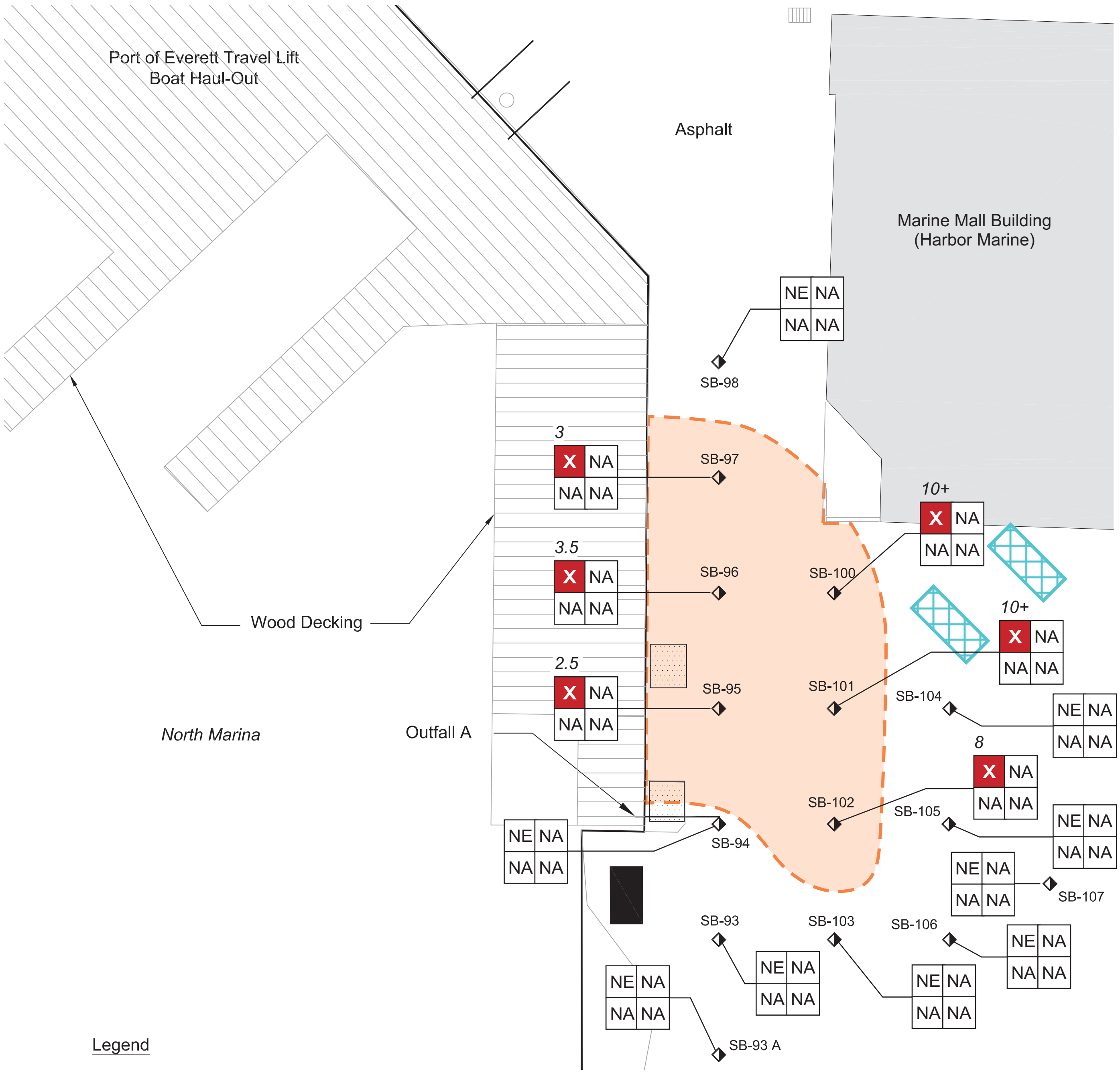
Job No. 33761354

Figure 4-5a
Soil Samples Exceeding Preliminary Cleanup Levels

URS

Everett Shipyard
Everett, Washington
RI/FS

33761354_44.cdr



Legend

Soil Boring Sample

Concrete Pad

Steel Plate

— Outfall A Approximate Location of Stormwater Outfall

NE Does Not Exceed Preliminary Cleanup Level

X Exceeds Preliminary Cleanup Level

NA Not Analyzed

TPH Total Petroleum Hydrocarbons – Diesel Range

CPAH Carcinogenic Polycyclic Aromatic Hydrocarbons

PCB Polychlorinated Biphenyl

Metallic Object Located During GPR Survey (Potential UST)

Lateral Extent of Impacted Soil, Dashed Where Inferred or Uncertain

2.0 ← Estimated Thickness of Soil Exceeding Preliminary Cleanup Level (ft)

TPH	Metals
CPAH	PCB

N

0 10 20

SCALE IN FEET

Basemap provided by Port of Everett

Job No. 33761354

Figure 4-5b

Soil Samples Exceeding Preliminary Cleanup Levels – Bulkhead Area

URS

Everett Shipyard
Everett, Washington
RI/FS

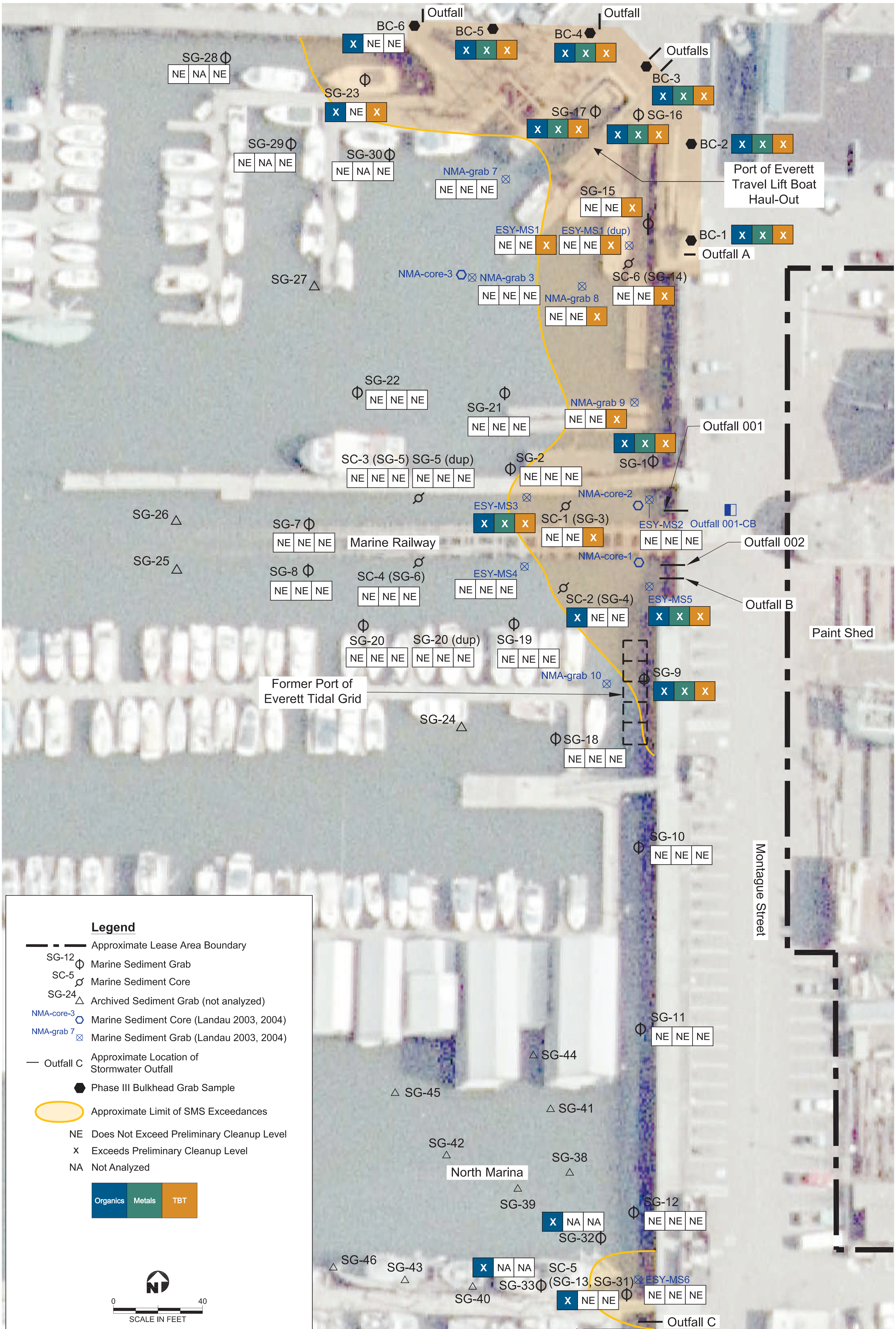
33761354_43.CDR

Figure 4-6
Indicator Hazardous Substances Concentrations in Groundwater

Job No. 33761354

URS

Everett Shipyard
Everett, Washington
RI/FS



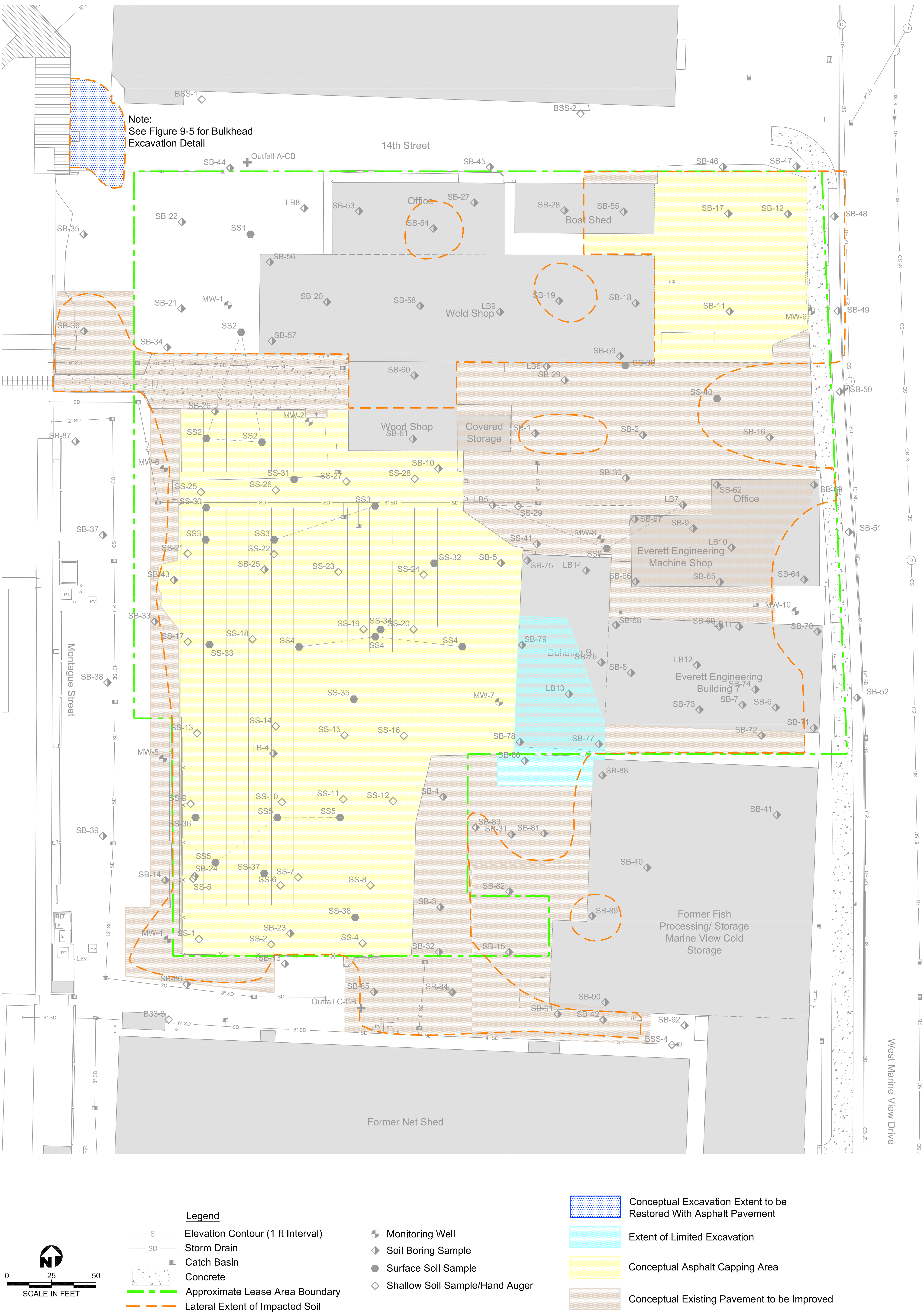
Job No. 33761354

Figure 4-7

Area of SMS Exceedance in Shallow Sediment

URS

Everett Shipyard
Everett, Washington
RI/FS



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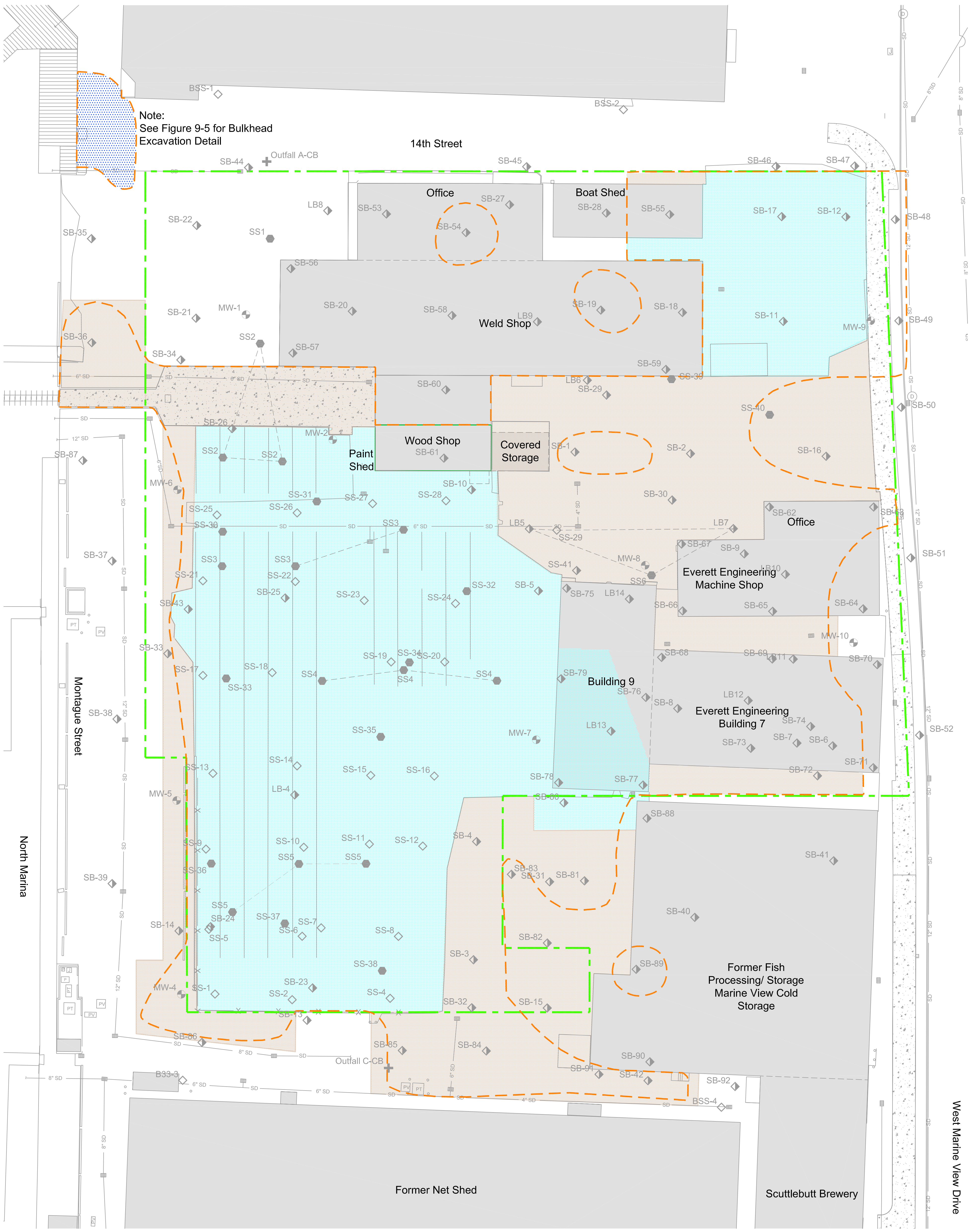
Mod: 05/02/2011, 08:35 | Plotted: 05/02/2011, 08:36 | john_knobbs

Figure 9-1

Uplands Alternative 1 - Targeted PCB Soil Excavation, Capping and Institutional Control

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

- Elevation Contour (1 ft Interval)
- Storm Drain
- Catch Basin
- Concrete
- Approximate Lease Area Boundary
- Lateral Extent of Impacted Soil
- Monitoring Well
- Soil Boring Sample
- Surface Soil Sample
- Shallow Soil Sample/Hand Auger
- Conceptual Excavation Extent to be Restored With Asphalt Pavement
- Conceptual Existing Pavement to be Improved
- Conceptual Excavation Extent

0 25 50
SCALE IN FEET

Figure 9-2

Uplands Alternative 2 - Excavation of Unpaved Areas, Capping of Paved Areas and Institutional Controls

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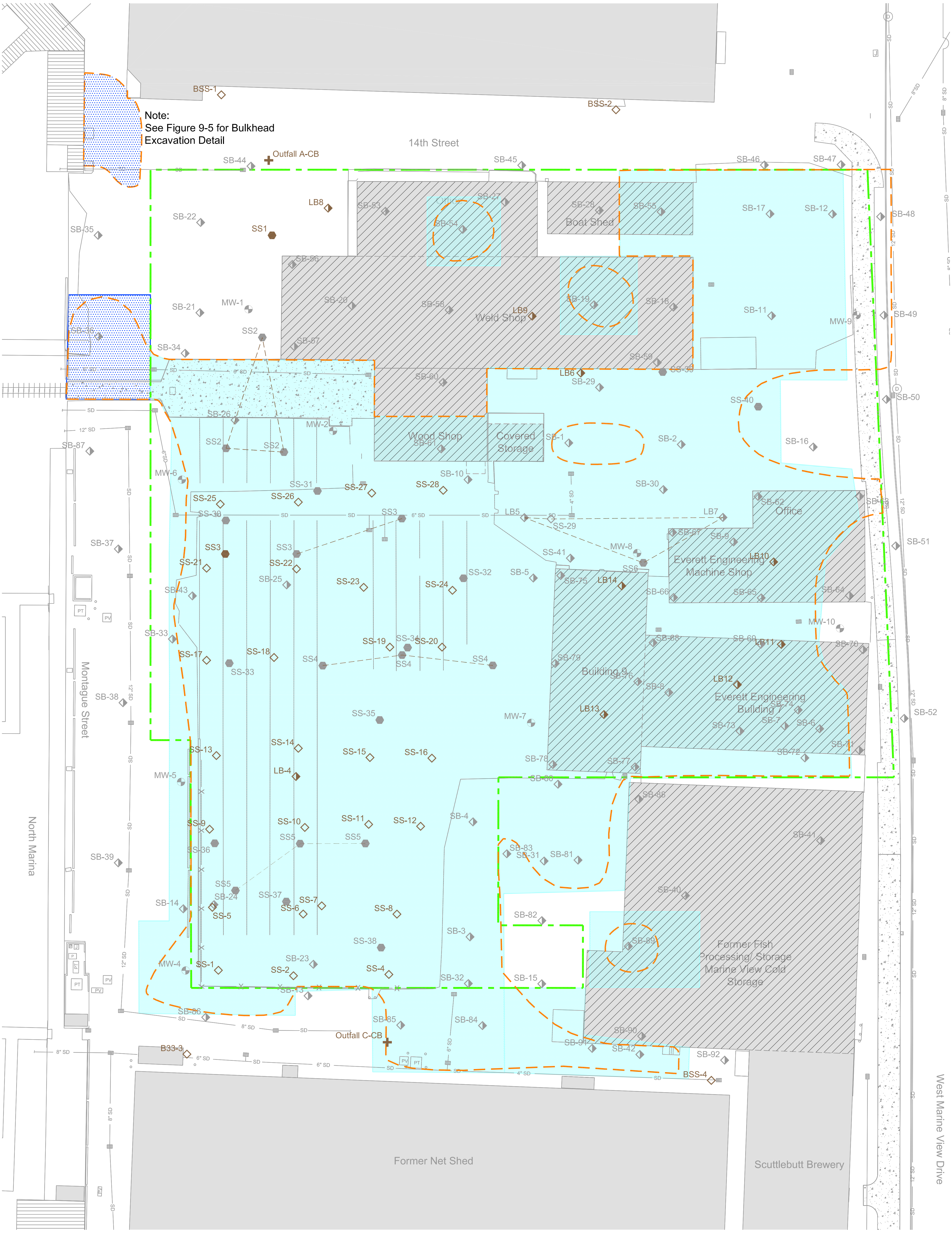
URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

Elevation Contour (1 ft Interval)	Monitoring Well
Storm Drain	Soil Boring Sample
Catch Basin	Surface Soil Sample
Concrete	Shallow Soil Sample/Hand Auger
Approximate Lease Area Boundary	Conceptual Excavation Extent to be Restored With Asphalt Pavement
Lateral Extent of Impacted Soil	Conceptual Excavation Extent
	Buildings to be Demolished

0 25 50
SCALE IN FEET

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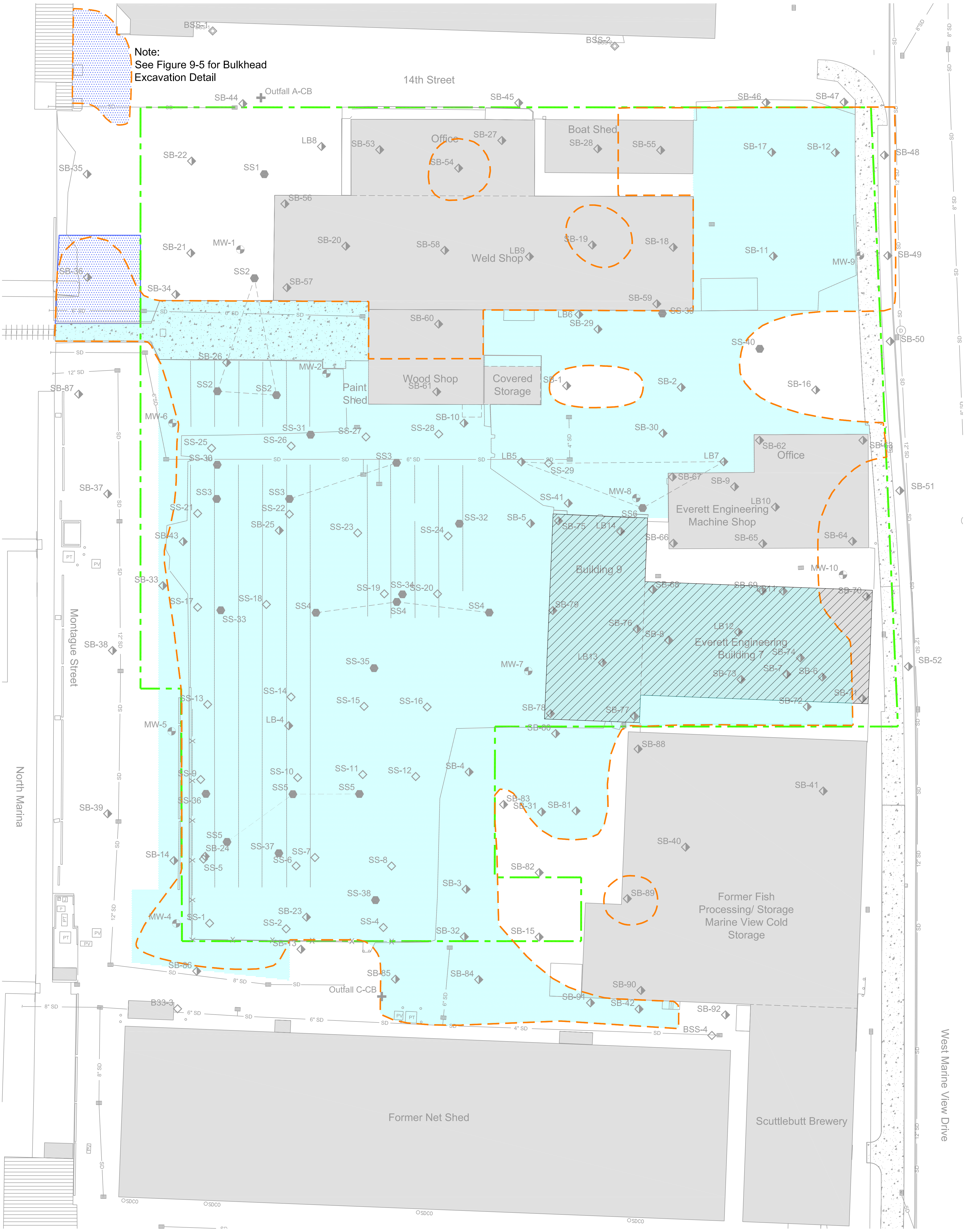
Mod: 05/02/2011, 08:38 | Plotted: 05/02/2011, 08:39 | john_knobbs

Figure 9-3

Uplands Alternative 3 - Building Demolition and Complete Excavation

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

Elevation Contour (1 ft Interval)	Monitoring Well
Storm Drain	Soil Boring Sample
Catch Basin	Surface Soil Sample
Concrete	Shallow Soil Sample/Hand Auger
Approximate Lease Area Boundary	Conceptual Excavation Extent to be Restored With Asphalt Pavement
Lateral Extent of Impacted Soil	Conceptual Excavation Extent
	Buildings to be Demolished

0 25 50
SCALE IN FEET

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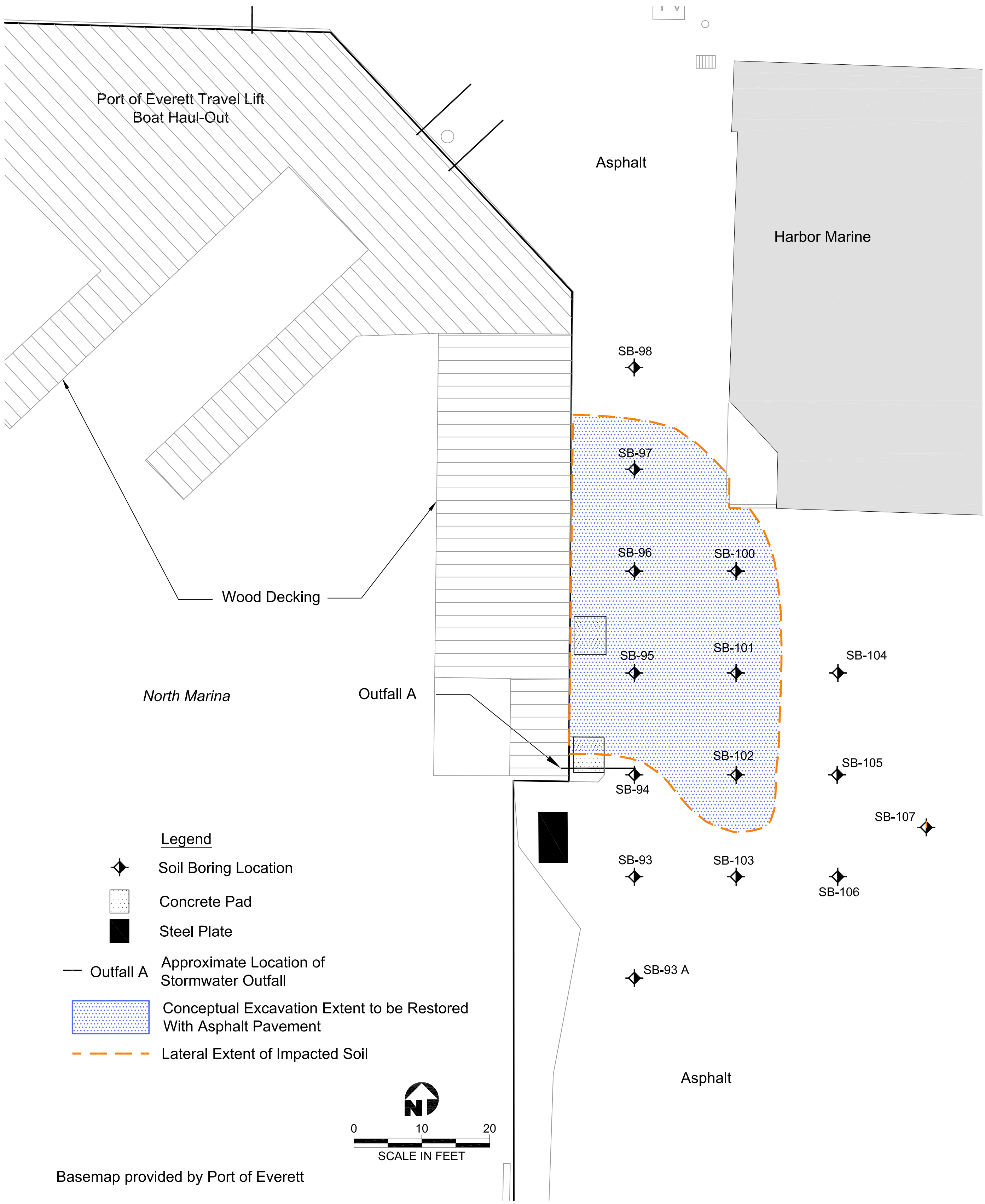
Mod: 05/02/2011, 08:40 | Plotted: 05/02/2011, 08:40 | john_knobbs

Figure 9-4

Uplands Alternative 4 - Targeted PCB Soil Excavation, Targeted Contaminant Mass Removal Excavation and Institutional Controls

URS

Everett Shipyard
Everett, Washington
RI/FS



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URS

Figure 9-5
Limited Bulkhead Excavation
Everett Shipyard
Everett, Washington
RI/FS

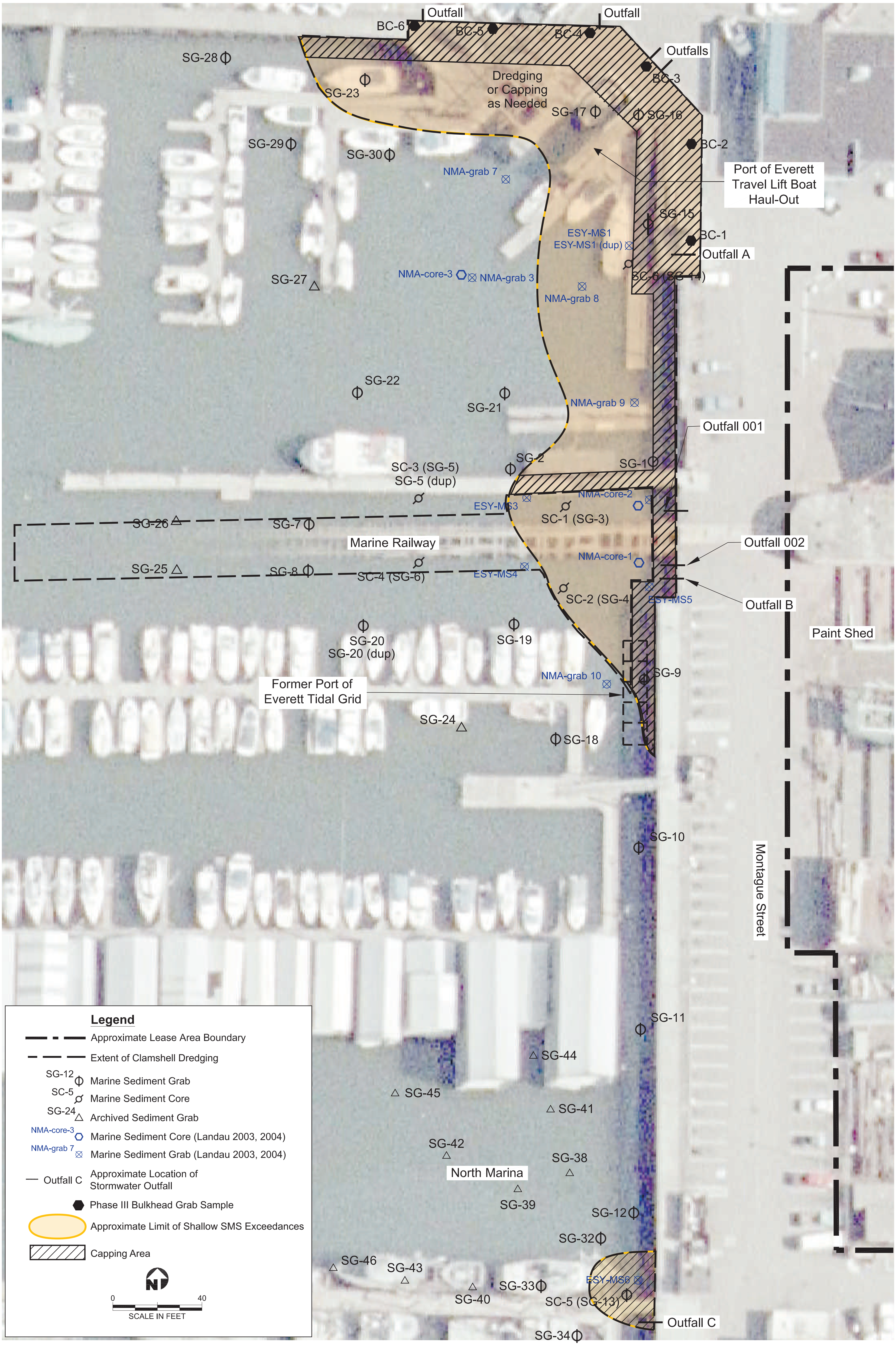


Figure 9-6

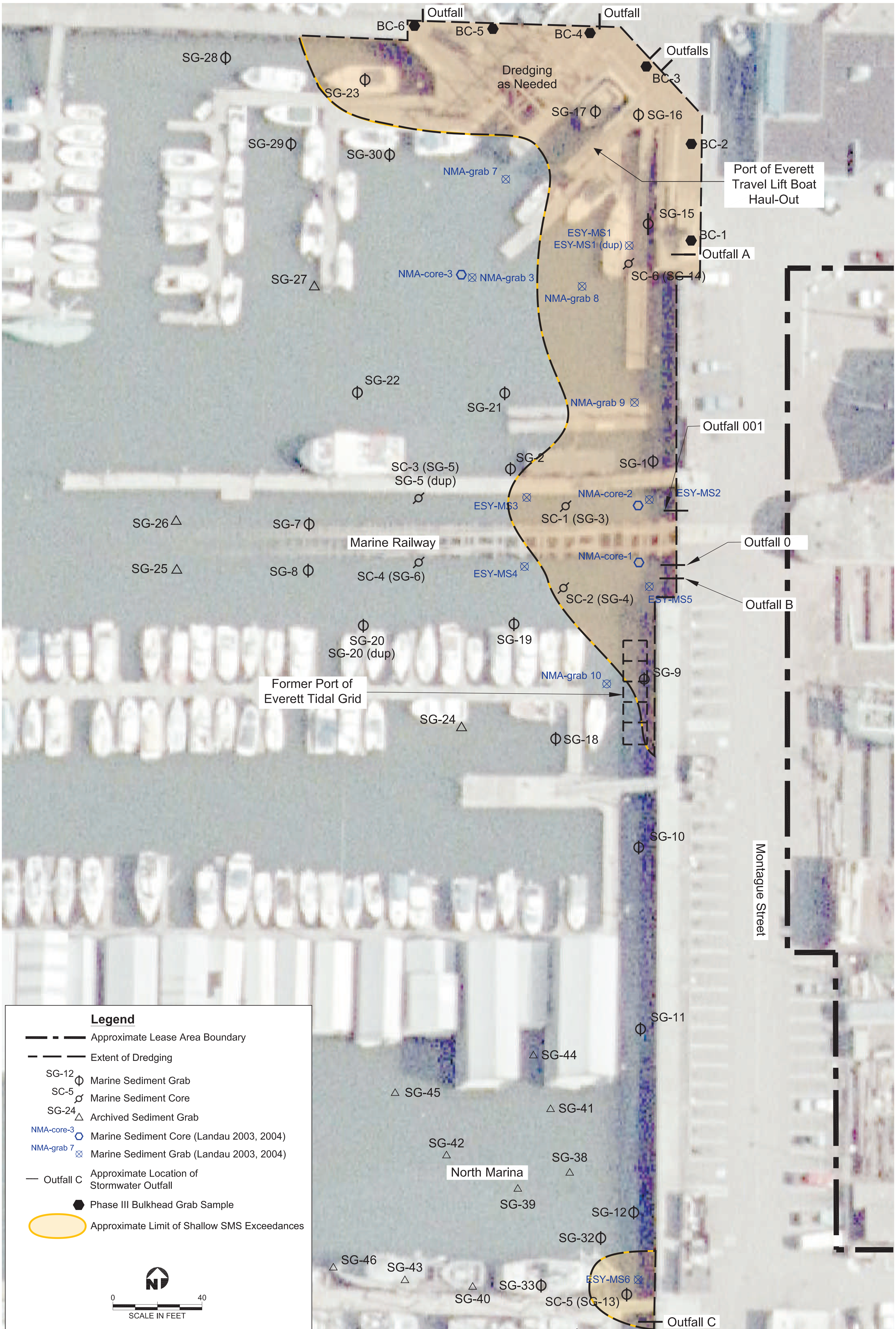
Job No. 33761354

Marine Sediment Alternative 1 - Targeted Dredging and Containment

URS

Everett Shipyard
Everett, Washington
RI/FS

33761354_50.cdr



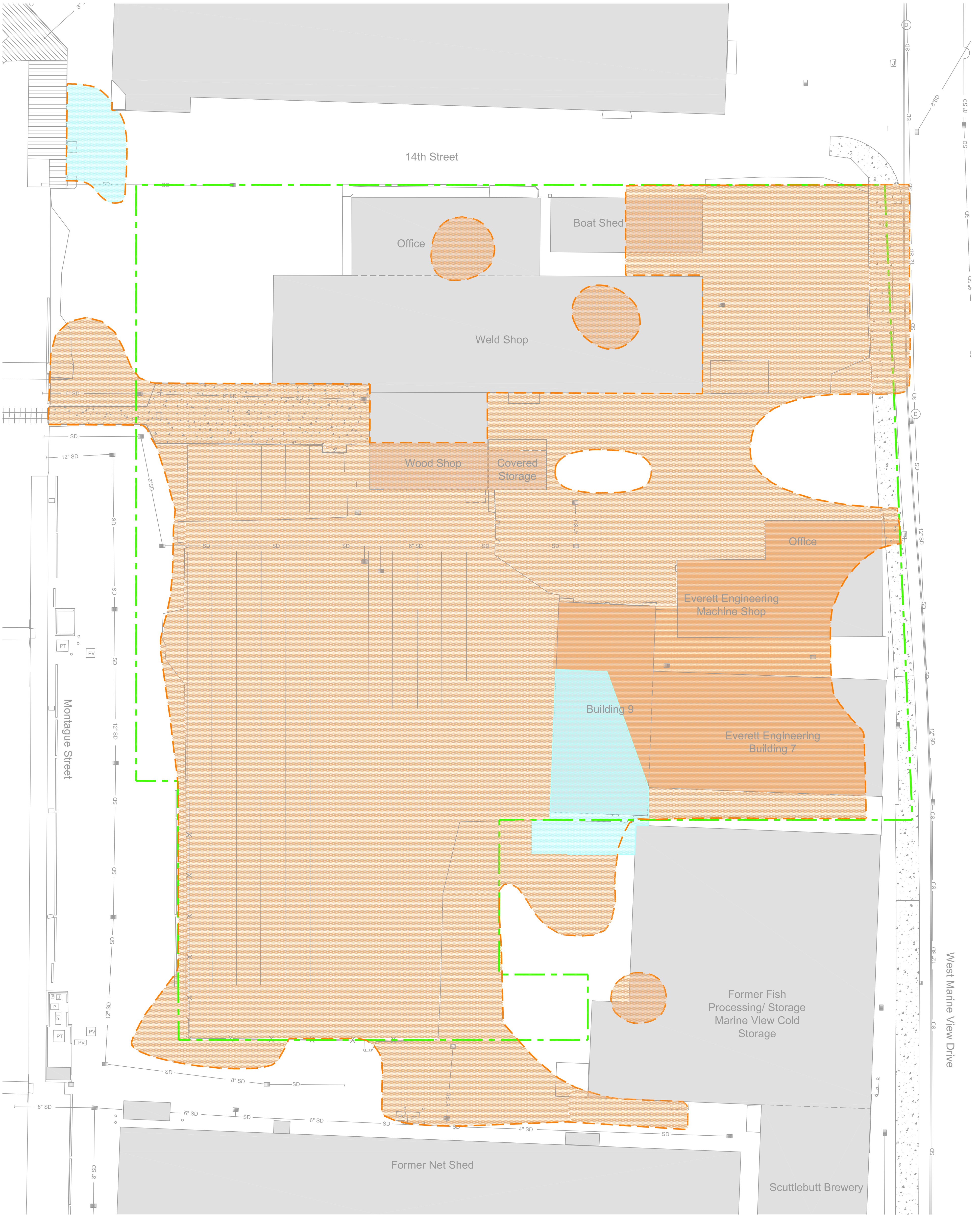
Job No. 33761354

Figure 9-7

Marine Sediment Alternative 2 - Mass Dredging

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

- SD — Storm Drain
- Catch Basin
- Concrete
- Approximate Lease Area Boundary
- Approximate Lateral Extent of Impacted Soil
- Conceptual Excavation Extent
- Approximate Extent of Residual Soil Exceeding Preliminary Cleanup Levels to be Managed under the Soil Management Plan Per Section 9.3.

cPAH Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs Polychlorinated Biphenyls
TPH Total Petroleum Hydrocarbons
TTEC Total Toxicity Equivalent Concentration

N

0 25 50
SCALE IN FEET

Alternative 1 Summary

Mass Removal (%)					
Arsenic	Lead	TPH-Diesel	TPH-Oil	cPAHs (TTEC)	PCBs
2.6	7.8	48	1.7	3.0	58
Excavated Soil Volume: 1,300 cubic yards					

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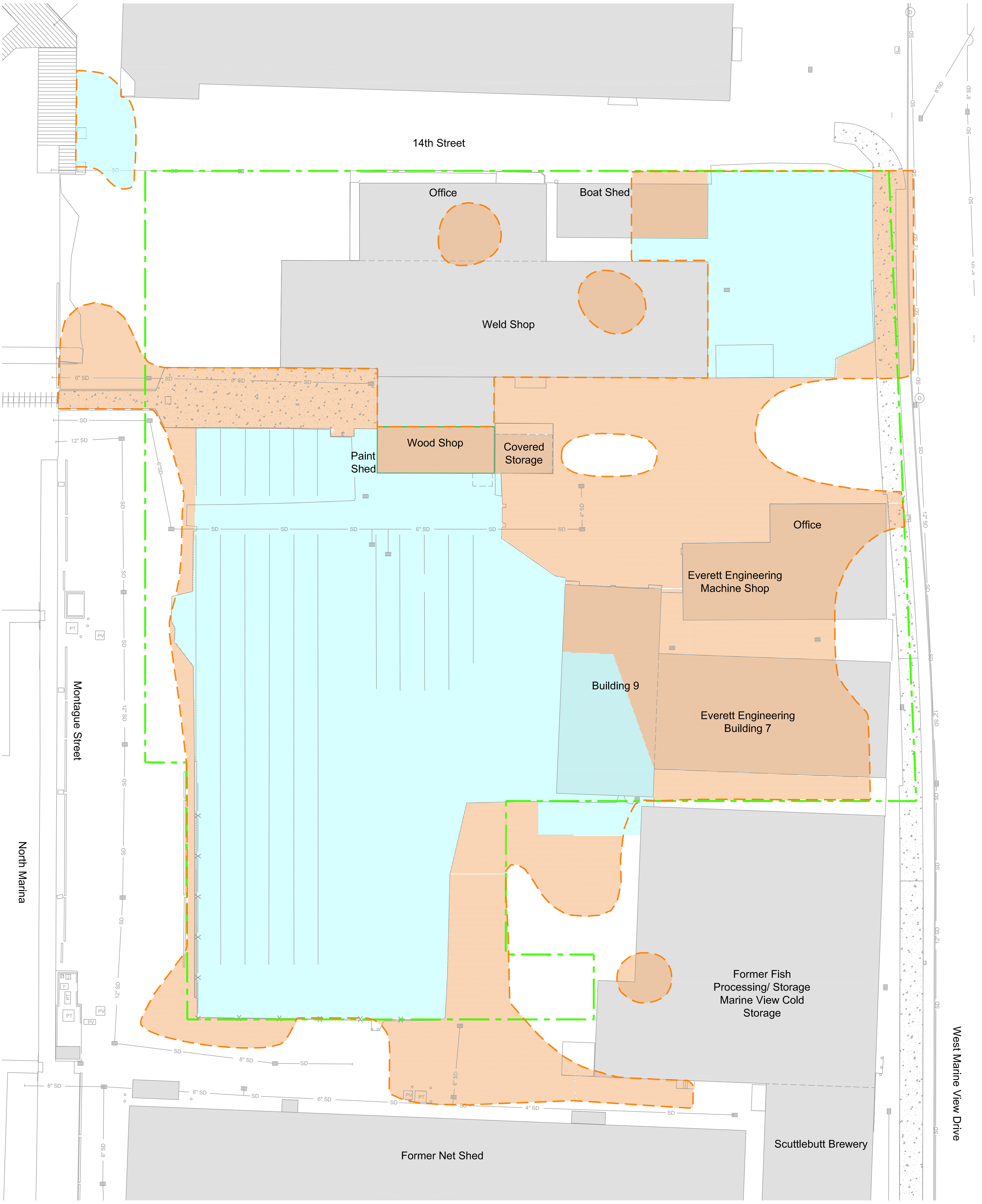
Mod: 05/02/2011, 08:44 | Plotted: 05/02/2011, 08:45 | john_knobbs

Figure 10-1
Uplands Alternative 1 - Extent of Residual Soil Impacts

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

- SD — Storm Drain
- Catch Basin
- Concrete
- Approximate Lease Area Boundary
- Approximate Lateral Extent of Impacted Soil
- Conceptual Excavation Extent
- Approximate Extent of Residual Soil Exceeding Preliminary Cleanup Levels to be Managed under the Soil Management Plan Per Section 9.3.

cPAH Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs Polychlorinated Biphenyls
TPH Total Petroleum Hydrocarbons
TTEC Total Toxicity Equivalent Concentration

0 25 50
SCALE IN FEET

Alternative 2 Summary

Mass Removal (%)					
Arsenic	Lead	TPH-Diesel	TPH-Oil	cPAHs (TTEC)	PCBs
74	59	85	41	61	92
Excavated Soil Volume: 9,400 cubic yards					

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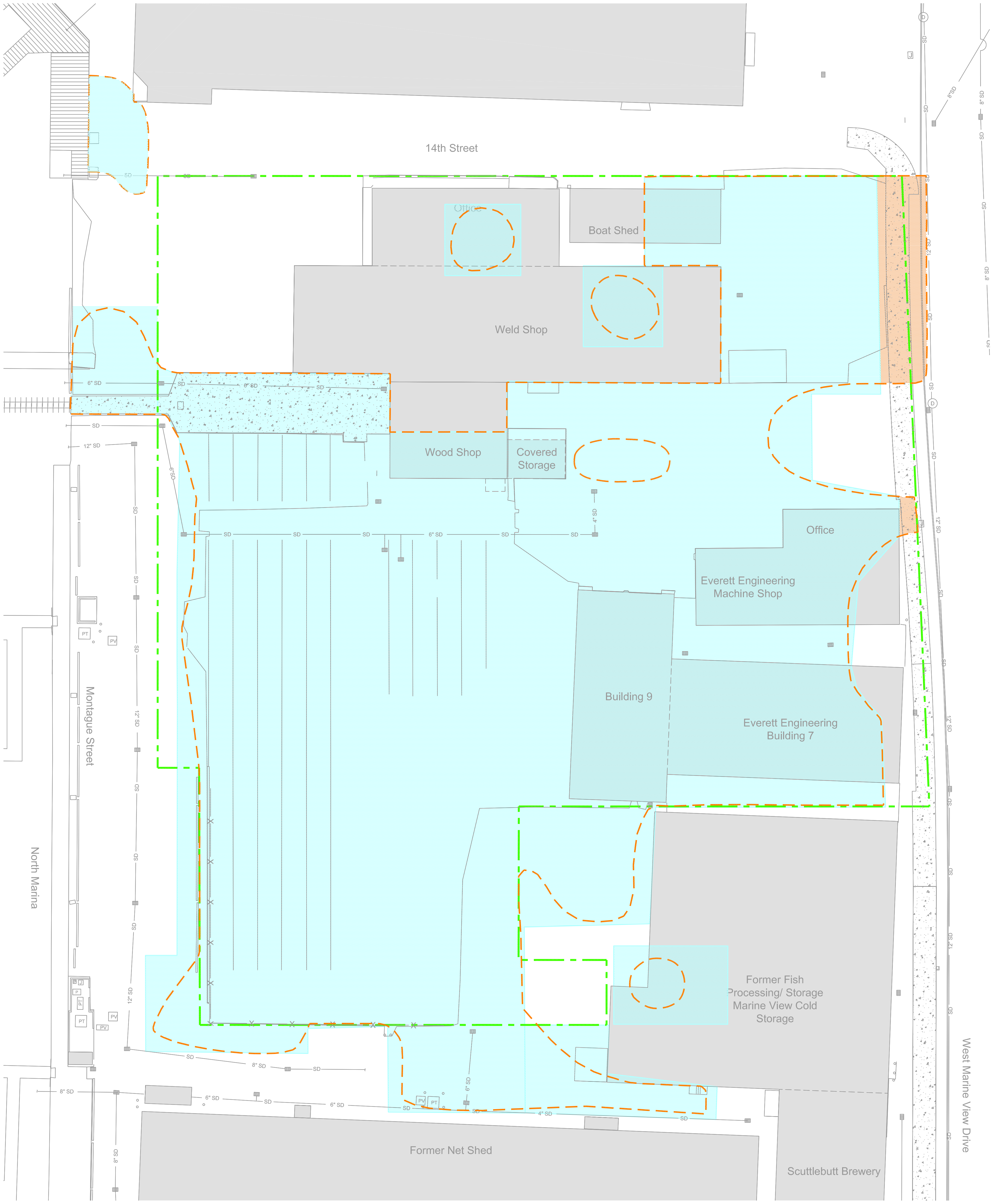
Figure 10-2
Uplands Alternative 2 - Extent of Residual Soil Impacts

Everett Shipyard
Everett, Washington
RI/FS



Legend

SD	Storm Drain
	Catch Basin
	Concrete
	Approximate Lease Area Boundary
	Approximate Lateral Extent of Impacted Soil
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
TPH	Total Petroleum Hydrocarbons
TTEC	Total Toxicity Equivalent Concentration
	Conceptual Excavation Extent
	Approximate Extent of Residual Soil Exceeding Preliminary Cleanup Levels to be Managed under the Soil Management Plan Per Section 9.3.

N

0 25 50

SCALE IN FEET

Alternative 3 Summary

Mass Removal (%)					
Arsenic	Lead	TPH-Diesel	TPH-Oil	cPAHs (TTEC)	PCBs
97	98	>99	>99	98	>99
Excavated Soil Volume: 18,800 cubic yards					

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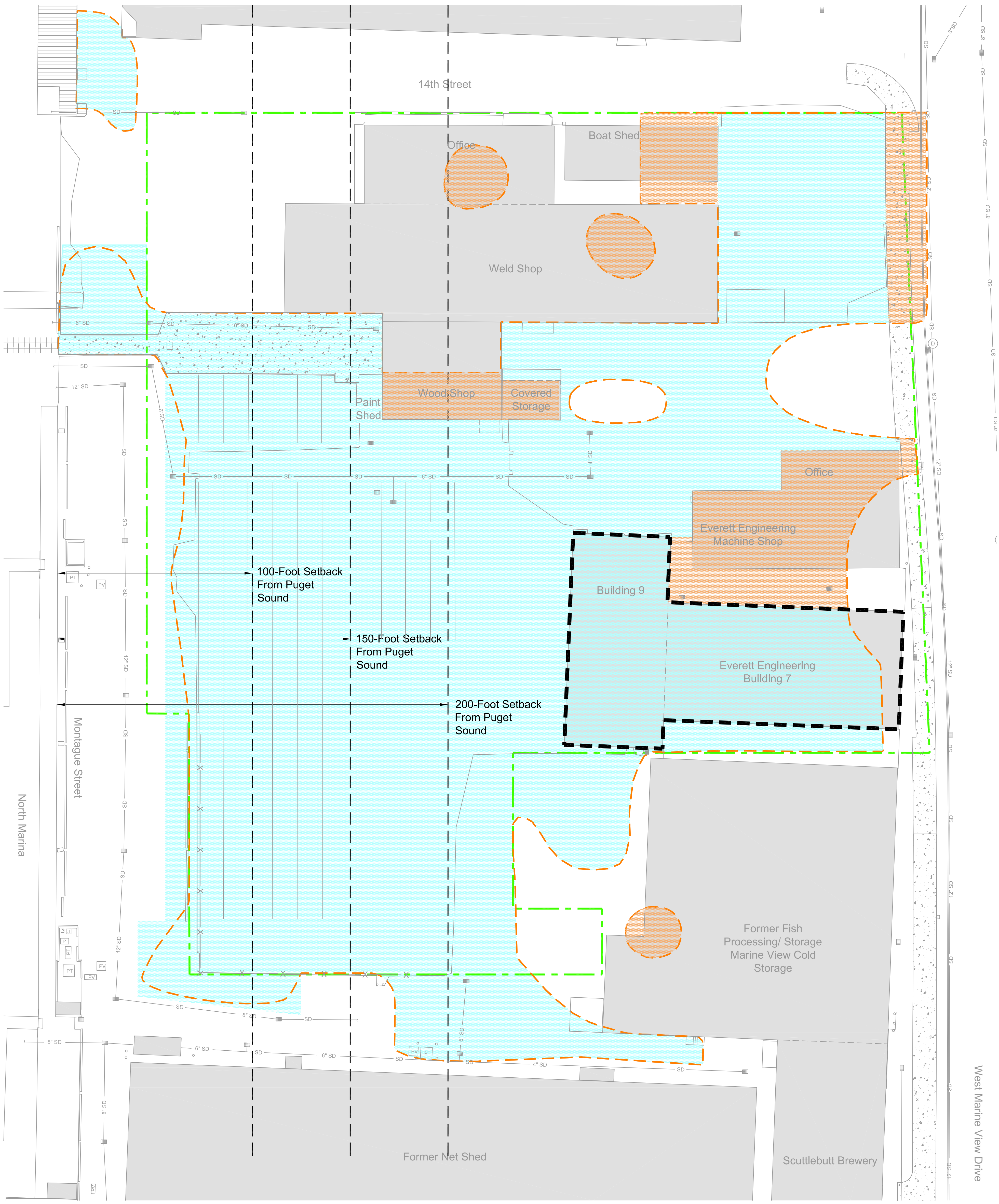
Figure 10-3

Uplands Alternative 3- Extent of Residual Soil Impacts

URS

Everett Shipyard
Everett, Washington
RI/FS



Legend

SD	Storm Drain
	Catch Basin
	Concrete
	Approximate Lease Area Boundary
	Approximate Lateral Extent of Impacted Soil
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
TPH	Total Petroleum Hydrocarbons
TTEC	Total Toxicity Equivalent Concentration
	Conceptual Excavation Extent
	Approximate Extent of Residual Soil Exceeding Preliminary Cleanup Levels to be Managed under the Soil Management Plan Per Section 9.3.
	Buildings Requiring Removal Under Alternative 4

0 25 50
SCALE IN FEET

Alternative 4 Summary

Mass Removal (%)					
Arsenic	Lead	TPH-Diesel	TPH-Oil	cPAHs (TTEC)	PCBs
96	93	>99	99	90	99
Excavated Soil Volume: 14,800 cubic yards					

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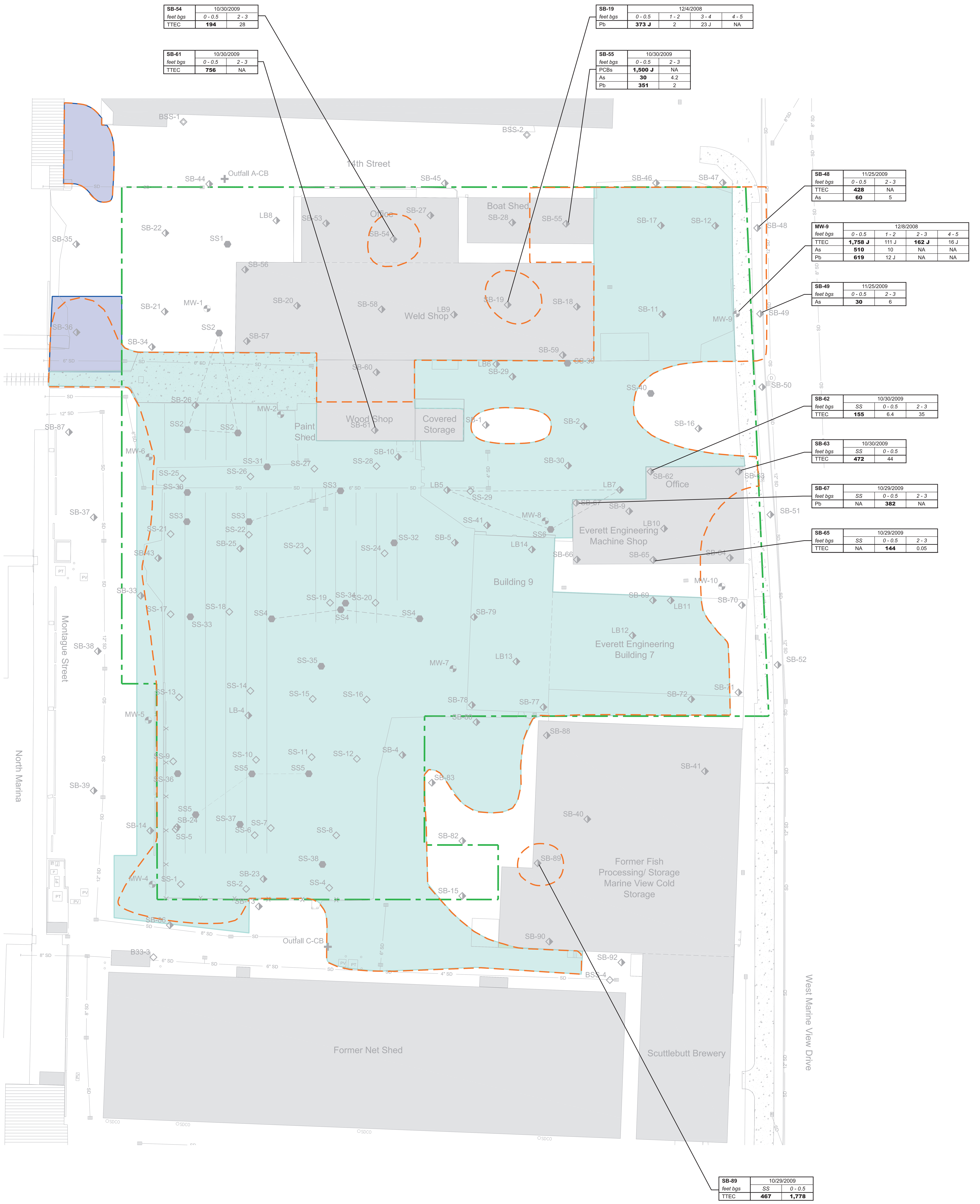
URS

Figure 10-4
Uplands Alternative 4 - Extent of Residual Soil Impacts

Everett Shipyard
Everett, Washington
RI/FS



Legend

- SD — Storm Drain
- Catch Basin
- Concrete
- Approximate Lease Area Boundary
- Lateral Extent of Impacted Soil
- Monitoring Well
- Soil Boring Sample
- Surface Soil Sample
- Shallow Soil Sample/Hand Auger
- Conceptual Excavation Extent to be Restored With Asphalt Pavement
- Conceptual Excavation Extent

bold	Exceeds Primary Cleanup Level
TTEC	Total Toxic Equivalent Concentration (µg/kg)
PCBs	Total Polychlorinated Biphenyls (µg/kg)
As	Arsenic (mg/kg)
Pb	Lead (mg/kg)
NA	Not Analyzed or Not Available
bgs	Below Ground Surface
mg/kg	Milligrams per Kilogram
µg/kg	Micrograms per Kilogram
SS	Sub-Slab Soil Sample
J	Estimated Value

Other indicator hazardous substances (i.e., antimony) may be present and are summarized in Table 4-1.

Job No. 33761354

Figure 11-1
Exceedances of Indicator Hazardous Substances in Soil following Implementation of Alternative 4

URS

Everett Shipyard
Everett, Washington
RI/FS

Table 1-1
Site Development and Operations Summary
Everett Shipyard
Everett, Washington
RI/FS

BUILDING / AREA	ACTIVITY	EXAMPLES OF CHEMICALS USED / STORED	DATES / RANGE	DISPOSAL PRACTICES
Current Buildings / Areas				
Weld Shop Building Includes Fisherman's Boat Shop (FBS) / West end of building; and "Crane Shed" / East end of building.	Boat repairs including welding, cutting, machining. Reportedly, ESY operations have not included engine repair work.	Cutting oil and water treatment flocculent in containers of less than and equal to 55 gallons in volume, totaling less than 100 gallons during site reconnaissance. Self contained solvent sink removed in the 1980s. Historic operations reportedly included use of methyl ethyl ketone (MEK).	West portion of building: 1947 aerial photo. Tax assessor: 1940 construction. East portion of building : 1978 aerial photo. Tax assessor: 1969 construction.	Offsite disposal by Emerald Services, Inc.
Office Building (North of Weld Shop)	Office operations.	Heating oil AST; possible former UST (both located on west side of building).	Heating oil likely used since late 1940s.	Not applicable
Wood Shop Building	Fabricate wood components, pattern shop.	Glues, wood filler, wood stain, in pint to 1 gallon volume containers.	Earliest documented building presence: 1965 aerial photo.	Offsite disposal by Emerald Services, Inc.
Paint Shed	Storage and cleanup of paints, coatings and solvents; cleanup of coating application equipment.	Paints coatings, and solvents in containers of less than and equal to 5 gallons in volume totaling less than 100 gallons during site reconnaissance.	1957 and 1968 Sanborn maps included a "Paint Shop" located within or adjacent to the eastern portion of the weld shop. The current paint shed is evident in the 1984 aerial photograph.	
Steam Box Shed	Wood shaping by use of steam.	Fuel oil AST.	Earliest documented building presence: 1978 aerial photo.	
Machine Shop Building Subleased to Everett Engineering from construction until 2007.	Machine shop and offices.	Historic presumed: cutting coolants, machine lubricants, hydraulic fluid. Building occupied by another tenant through September 2009.	Earliest documented building presence: 1969 aerial photograph. Tax Assessor: 1980 construction.	Unknown

Table 1-1
Site Development and Operations Summary
Everett Shipyard
Everett, Washington
RI/FS

BUILDING / AREA	ACTIVITY	EXAMPLES OF CHEMICALS USED / STORED	DATES / RANGE	DISPOSAL PRACTICES
Building 7 / Building 9 Occupied by Everett Engineering from construction until 2007.	Machine shop	Historic presumed: cutting coolants, machine lubricants, hydraulic fluid. Building occupied by another tenant through September 2009.	Building 7: 1984 aerial photograph. Building 9: 1991 aerial photograph. Tax Assessor: 1980 and 1989, respectively	Unknown
Boat Shed	Chemical storage area in west end	Used for storage of hazardous substances since 2002 and includes a bermed containment area. Hazardous substances stored throughout in larger containers were consolidated in this location. Paints, coatings, hydraulic fluid, anti-freeze in containers of less than and equal to 55 gallons in volume totaling approximately 150 gallons during site reconnaissance.	Earliest documented building presence: 1978 aerial photograph; current configuration in 1991 aerial photograph.	Offsite disposal by Emerald Services, Inc.
Skids (Side Tracks) ***-Northwest (still present)*** ***-Southwest (removed)*** ***-East (removed)***	Painting and sandblasting at current and historic locations of all skids. Sand blasting is performed by subcontractors.	Abrasive grit; paint. Historically copper slag may have been used as grit; more recently grits used include "Klean Blast" and "Green Diamond". Soil and grit that accumulated between the northwest skids were excavated as needed to maintain suitable working grade. Soil and grit between the southwest skids was allowed to fill in the top of the skid foundations. Bilge water was pumped out of vessels by contractor and taken offsite for disposal. Some boat owners may have performed engine maintenance on their vessels while they were stored in these areas.	Northwest and southwest skids already present in 1947 aerial photo, however, not in use. Skids on the southwest portion of the Site were not visible in the 1984 aerial photograph. East skids located east of wood shop first apparent in 1965 photograph; no longer present in 1991 photograph.	Abrasive grit historically collected by shovel after reached depth that impeded repair work. Grit was collected and shipped offsite by subcontractors. Bilge water was disposed offsite by Emerald Services, Inc.
Marine Railway	Moving boats from, and returning them to, water of Port Gardner, and across land to work area.	Boat maintenance activities while on the marine railway were very limited.	Earliest documented presence: "Boat Skid" in 1950 Sanborn Map - does not extend into water. Railway extends into water in 1965 aerial photograph.	None as activities were very limited.

Table 1-1
Site Development and Operations Summary
Everett Shipyard
Everett, Washington
RI/FS

BUILDING / AREA	ACTIVITY	EXAMPLES OF CHEMICALS USED / STORED	DATES / RANGE	DISPOSAL PRACTICES
Travel Lift Boat Haul-Out Area (Outside Lease Area)	Port of Everett provided facility for hull cleaning, general boat washing, painting for private individuals approximately 150 feet north of the marine railway.	Paints	Present in 1965 aerial photograph.	Washed into marina.
Historic Buildings/Operation				
Building on NE Corner of Site Along West Marine View Drive	Boat Storage Outboard motor repair Propeller shop	Presumed: lubricants and oil	Earliest documented building presence: 1965 aerial photograph. No longer apparent in 1991 aerial photograph.	Unknown
Paint Shop Building Southeast of original weld shop	Current employees and interviewees not familiar with specifics	Presumed: paints and solvents.	Earliest documented building presence: 1947 aerial photograph. Weld shop extended over this area in 1978 aerial photograph. A paint shop also depicted north of this in 1968 Sanborn Map.	Unknown
Re-Saw Building East of original weld shop	Current employees and interviewees not familiar with specific operations or chemical use.	Unknown	Earliest documented building presence: 1947 aerial photograph. No longer apparent in 1978 aerial photograph.	Unknown
Fish Processing Mid-South portion of property	Fish Processing	Presumed: Refrigerants, sanitizers.	Earliest documented building presence: 1969 aerial photograph. No longer apparent in 1984 aerial photograph.	Unknown
Net Dipping (Outside Lease Area)	Presumed chemical treatment and drying of fibrous materials to prolong successful life of fishing nets.	Unknown	Shown on 1950 and 1957 Sanborn maps. No longer present on maps in 1968.	Unknown

Table 1-1
Site Development and Operations Summary
Everett Shipyard
Everett, Washington
RI/FS

BUILDING / AREA	ACTIVITY	EXAMPLES OF CHEMICALS USED / STORED	DATES / RANGE	DISPOSAL PRACTICES
Tidal Grid (Outside Lease Area)	Port of Everett provided grid where boat owners could work on boats during low tide. Boat cleaning, painting and general maintenance were preformed in this area by private individuals directly south of Marine Railway and west of the current bulkhead.	Paints	Appears to be evident in 1984 aerial photograph and was reportedly used until the early 1990s.	Washed into marina.

Notes: Description of activities, chemicals usage, storage and disposal practices based on site inspection and interview with Everett Shipyard personnel in April 2008.

Table 1-2
Storm Drain Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID	Organotins (ug/kg)				Total Metals (mg/kg)							
	Tributyl Tin Chloride	Dibutyl Tin Dichloride	Butyl Tin Dichloride	TBT as TBT ion	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc
Outfall A-CB	900	280	28 J	**800**	50	0.6 U	70	**1,100**	127	0.009	0.9 U	**1,530**
Outfall 001-CB	4,200	2,000	200 J	**3,700**	58	**10**	188	**14,100**	**740**	**4.21**	2	**9,910**
Outfall 002-CB1	1,300	390	140 J	**1,200**	41	2	82	**4,380**	480	0.329	2 U	**4,110**
Outfall B-CB	270	160	23 UJ	**240**	57	2	168	**2,470**	220	0.119	2 U	**2,290**
Outfall C-CB	350	140	23 UJ	**310**	**196**	2	154	**1,420**	348	0.358	1 U	**1,930**
MTCA Soil Cleanup Levels	NE	NE	NE	7,400	20 (A)	2 (A)	2,000(A)	3,000 (B)	250 (A)	2 (A)	400 (B)	24,000 (B)
CSL	NE	NE	NE	73	93	6.7	270	390	530	0.59	6.1	960
SMS	NE	NE	NE	NE	57	5.1	260	390	450	0.41	6.1	410

Notes:
MTCA - Model Toxics Control Act Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded May 2007
(https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx)
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B formula values unrestricted land use - direct contact pathway
Soil cleanup level for TBT as TBT ion is screening level established by Ecology for ingestion pathway with Equation 740-1 (RfDo=3e-4 mg/kg-day)
CSL - Cleanup Screening Levels and Minimum Cleanup Levels, WAC 173-204-520, Table III, Puget Sound Marine Sediment Screening Levels and Minimum Cleanup Levels;
CSL for TBT as TBT ion is bulk sediment screening level established by Ecology, which is conceptually equivalent to the SQS
SMS - Sediment Management Standards, WAC 173-204-320, Table 1, Marine Sediment Quality Standards
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
NE - Not established
U - Parameter was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the tabulated CSL and Minimum Cleanup Levels.
Samples collected in 2003 by Landau.

Table 1-3
Outfall #001 Analytical Results - 1999 to 2002
Everett Shipyard
Everett, Washington
RI/FS

Sample Date	Total Metals (mg/L)			TPH (mg/L)		Turbidity (NTU)		Conventionals	
	Copper	Lead	Zinc	Oil and Grease	Total Petroleum Hydrocarbons	Turbidity	Background Turbidity	TSS (mg/L)	pH (SU)
1/12/1999	**0.161**	0.150 U	**2.63**	2.10	NA	**198**	54.8	40	6.75
2/8/1999	**0.128**	**0.150**	**1.14**	1.08	NA	**33.7**	5.12	7.0	6.53
3/17/1999	**0.827**	**0.150**	**3.50**	6.63	NA	**15.7**	3.92	53	6.96
4/26/1999	**0.641**	0.150 U	**3.08**	1.00 U	NA	**33.9**	2.89	10	6.81
10/29/1999	**0.0512**	0.150 U	0.0796	6.73	NA	**593**	21.3	380	6.49
11/19/1999	**0.220**	0.150 U	**2.01**	2.90	NA	**149**	NA	6.0	6.55
2/29/2000	**0.503**	0.150 U	**1.29**	5.00 U	5.00 U	**202**	2.73	NA	NA
3/28/2001	**1.17**	**0.273**	**2.02**	5.00 U	5.00 U	**392**	9.85	120	6.93
4/30/2001	0.0300 U	0.150 U	**0.0399**	5.00 U	5.00 U	13.4	12.6	4.0	6.42
5/30/2001	**0.340**	**0.151**	**2.39**	5.00 U	5.00 U	NA	NA	NA	NA
6/4/2001	**0.322**	**0.296**	**1.88**	5.00 U	5.00 U	**122**	NA	NA	NA
6/11/2001	**0.421**	0.150 U	**0.711**	5.00 U	5.00 U	**59.5**	1.78	NA	NA
6/27/2001	**0.382**	**0.168**	**2.81**	5.00 U	5.00 U	**51.8**	1.00 U	NA	NA
9/26/2001	**0.386**	0.200 U	**1.99**	5.00 U	5.00 U	**136**	3.10	NA	NA
10/10/2001	**0.54**	**0.372**	**2.14**	**6.50**	5.00 U	**99.5**	1.40	NA	NA
11/29/2001	**0.261**	0.200 U	**1.36**	5.00 U	5.00 U	3.10	17.4	NA	NA
11/31/2001	**0.141**	0.200 U	**1.13**	5.00 U	5.00 U	**129**	1.52	NA	NA
12/11/2001	**0.159**	0.200 U	**1.37**	5.00 U	5.00 U	**82.8** [A]	2.59	NA	NA
1/8/2002	**0.905**	**0.418**	**1.92**	13.9	5.00 U	**115**	17.7	NA	NA
1/21/2002	**0.164**	0.150 U	**0.940**	5.00 U	5.00 U	5.90	2.90	NA	NA
3/12/2002	**0.384**	**0.221**	**2.42**	9.10	5.00 U	**170**	2.10	NA	NA
3/14/2002	**0.559**	**0.229**	**1.81**	9.40	7.50	**95.0**	5.60	NA	NA
5/20/2002	**0.142**	**0.0725**	**1.07**	5.00 U	5.00 U	**45.0**	1.90	NA	NA
6/4/2002	**0.436**	**0.138**	**2.79**	5.00 U	5.00 U	**26.0**	2.20	NA	NA
6/5/2002	**0.928**	**0.449**	**2.28**	5.00 U	5.00 U	**100**	2.10	NA	NA
7/8/2002	**0.211**	0.0500 U	**0.731**	5.00 U	5.00 U	**12.0**	2.20	NA	NA
9/3/2002	**0.936**	**0.807**	**7.50**	4.85 U	4.85 U	**120**	1.20	NA	NA
WA Marine Water Quality Standard	0.0037 [B]	0.0085 [B]	0.0856 [B]	NE	NE	5 NTU / 10% [C]	NA	NE	7.0-8.5

Table 1-3
Outfall #001 Analytical Results - 1999 to 2002
Everett Shipyard

Notes:

Sampling conducted in accordance with National Pollutant Discharge Elimination System (NPDES) permit number WA-003096-1.

Water Quality Standards for Surface Waters of the State of Washington, Chapter 173-201A WAC, amended November 20, 2006.

SU - Standard units

TPH - Total petroleum hydrocarbons

TSS - Total suspended solids

NA - Not applicable or not analyzed

NE - Not established

U - Parameter was analyzed for but not detected above the reporting limit shown.

[A] Turbidity sample lost by laboratory. Resampled 2/18/02 as replacement sample.

[B] Ambient criteria listed in WAC 173-201A are for the dissolved fraction. The reported chronic values have been calculated to reflect the total recoverable concentrations using marine conversion factors (CF) for copper (0.83), lead (0.951), and zinc (0.946). Criterion = (dissolved criterion) / CF

[C] Under WAC 173-201A-210 (1)(e), for extraordinary waters, turbidity must not exceed 5 NTU over background when the background is 50 NTU or less. When the background is more than 50 NTU, turbidity must not exceed 10% of the background level. When background turbidity is not available, the background turbidity is assumed to be zero.

Numbers in **bold** font indicate that the result reported exceeds the water quality standard.

Source: Everett Shipyard Discharge Monitoring Reports

Table 1-4
Marine Surface Water Analytical Results - 2001 to 2008
Everett Shipyard
Everett, Washington
RI/FS

Sample Date	**TPH (mg/L)**	
	Oil and Grease	**Total Petroleum Hydrocarbons**
6/22/2001	5.00 U	5.00 U
9/21/2001	5.00 U	5.00 U
1/14/2002	5.00 U	5.00 U
3/28/2002	5.00 U	5.00 U
6/7/2002	5.00 U	5.00 U
7/31/2002	5.10 U	5.10 U
11/7/2002	5.00 U	5.00 U
3/11/2003	5.00 U	5.00 U
7/11/2003	5.00 U	5.00 U
8/16/2003	5.00 U	5.00 U
11/11/2003	5.62 U	5.62 U
1/22/2004	5.00 U	5.00 U
4/5/2004	5.00 U	5.00 U
10/7/2004	5.00 U	5.00 U
6/27/2005	6.25 U	6.25 U
6/30/2005	5.00 U	5.00 U
9/7/2005	5.68 U	5.68 U
1/16/06 8:00 AM	5.10 U	5.10 U
1/16/06 3:00 PM	4.81 U	4.81 U
3/27/2006	4.90 U	4.90 U
6/14/2006	4.81 U	4.81 U
10/23/2006	5.05 U	5.05 U
3/1/2007	5.32 U	5.32 U
5/7/2007	5 U	NA
11/16/2007	5 U	NA
12/5/2007	**6**	NA
1/11/2008	5 U	NA
WA Marine Water Quality Standard	NE	NE

Notes:
Tabulated from client provided data that has not been validated by URS.
Sampling conducted in accordance with National Pollutant Discharge Elimination System (NPDES) Permit Number WA-003096-1.
TPH - Total petroleum hydrocarbons
NA - Not analyzed
NE - Not established
U - Parameter was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the permit requirement.

Table 2-1
Soil Sampling Locations and Rationale
Everett Shipyard
Everett, Washington
RI/FS

Area of Concern/Rationale	Location IDs	Sample Type
2008 Initial Field Investigation		
Surface soils in areas where cleaning, abrasive blasting, and repairing marine vessels occurred	SS-30 through SS-41	Surface grab
Area east of the wood shop where undocumented soil cleanup occurred in the late 1980s	SB-1, SB-2, SB-29, SB-30	Boring
Lateral extent of metals and petroleum hydrocarbons detected in previous borings in the southwestern portion of the Site	SB-3, SB-4, SB-5, SB-13, SB-14, SB-15, SB-32,SB-33, MW-4, MW-5, MW-6, MW-7	Boring
Oil staining on the floors near floor penetrations that may provide pathways to the subsurface	SB-6, SB-7, SB-8, SB-9	Boring
Soil staining adjacent to Steam Box	SB-10	Boring
Historic operations east, southeast and northeast of weld shop	SB-11, SB-12, SB-16, SB-17, MW-9	Boring
Stained soil west of Everett Engineering Machine Shop	MW-8	Boring
Weld shop operations and historic operations adjacent to the original weld shop structure	SB-18, SB-19, SB-20	Boring
Historic operations west and northwest of weld shop	SB-21, SB-22	Boring
Areas where elevated concentrations of petroleum hydrocarbons were previously detected	SB-23, SB-24, SB-25	Boring
Marine Railway	SB-26, SB-34	Boring
Historic operations (e.g., boat shed) located north of the weld shop	SB-27, SB-28	Boring
Area between west edge of leasehold and bulkhead that may have been impacted by site activities	SB-35, SB-36, SB-37, SB-38, SB-39	Boring
Historic operations in location of former Fish Processing Building	SB-31, SB-40, SB-41	Boring
Area north of Former Net Shed outside leasehold and reporeted ESY operation areas	SB-42	Boring
2009 Supplemental Field Investigation		
Adjacent to former monitoring well MW-3 to assess western extent of soil impacts	SB-43	Boring
Assess extent of soil impacts north of the Lease Area	SB-44, SB-45, SB-46, SB-47	Boring
Assess extent of soil impacts within right-of-way along West Marine View Drive	SB-48, SB-49, SB-50, SB-51, SB-52	Boring

Table 2-1
Soil Sampling Locations and Rationale
Everett Shipyard
Everett, Washington
RI/FS

Area of Concern/Rationale	Location IDs	Sample Type
2008 Initial Field Investigation		
Assess potential impacts beneath Everett Shipyard office and wood shop and further delineate potential impacts beneath the weld shop and boat shed	SB-53, SB-54, SB-55, SB-56, SB-57, SB-58, SB-59, SB-60, SB-61	Boring
Assess the extent of soil impacts beneath the Everett Engineering buildings	SB-62, SB-63, SB-64, SB-65, SB-66, SB-67, SB-68, SB-69, SB-70, SB-71, SB-72, SB-73, SB-74, SB-75, SB-76, SB-77, SB-78, SB-79	Boring
Assess extent of cPAHs detected at SB-31	SB-80, SB-81, SB-82, SB-83	Boring
Assess extent of soil impacts south of the Lease Area	SB-84, SB-85, SB-86	Boring
Assess extent of soil impacts near marine railway	SB-87	Boring
Assess potential impacts beneath the former fish processing building and lateral extent of soil impacts near boring SB-42	SB-88, SB-89, SB-90, SB-91, SB-92	Boring
2010 Supplemental Field Investigation		
Assess potential upland soil impacts adjacent to Port of Everett Travel Lift Boat Haul-Out.	SB-93A, SB-93, SB-94, SB-95, SB-96, SB-97-SB-98, SB-100, SB-101, SB-102, SB-103, SB-104, SB-105, SB-106, SB-107	Boring

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
Landau 2003											
SS1	0 - 1	0 - 1	Asphalt	x		x					
SS2	0 - 1	0 - 1	Asphalt	x		x					
SS3	0 - 1	0 - 1	Bare ground	x		x					
SS4	0 - 1	0 - 1	Bare ground	x		x					
SS5	0 - 1	0 - 1	Bare ground	x		x	x				
SS6	0 - 1	0 - 1	Asphalt	x		x			x		
LB1	0 - 1	0 - 1	Asphalt	x		x			x		
LB2	0 - 1	0 - 1	Asphalt	x		x					
LB9	0 - 2	0 - 2	Concrete	x						x	
LB9	4 - 6	4 - 6									
LB10	0 - 2	0 - 2	Concrete	x						x	
LB10	3 - 5	3 - 5									
LB11	0 - 2	0 - 2	Concrete	x						x	
LB11	3 - 5	3 - 5									
LB12	0 - 2	0 - 2	Concrete	x						x	
LB12	3 - 5	3 - 5									
LB13	0 - 2	0 - 2	Concrete	x						x	
LB13	3.5 - 5.5	3.5 - 5.5									
LB14	0 - 2	0 - 2	Concrete	x						x	
LB14	4 - 6	4 - 6									
URS 2007											
BSS-1	1 - 1.5	1 - 1.5	Bare ground	x		x					
BSS-1	3 - 3.5	3 - 3.5		x		x					
BSS-2	1 - 1.5	1 - 1.5	Bare ground	x		x					
BSS-3	1 - 1.5	1 - 1.5	Bare ground	x		x					
BSS-3	3 - 3.5	3 - 3.5		x		x					
BSS-4	1 - 1.5	1 - 1.5	Bare ground	x		x					
BSS-4	3 - 3.5	3 - 3.5				x					
SS-1	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-1	3 - 3.5	3 - 3.5				x					
SS-2	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-2	3 - 3.5	3 - 3.5		x		x					
SS-4	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-4	3 - 3.5	3 - 3.5				x					

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2007											
SS-5	1 -1.5	1 -1.5	Bare ground	x		x					
SS-5	3 - 3.5	3 - 3.5		x		x					
SS-5	5 - 5.5	5 - 5.5		x							
SS-6	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-6	3 - 3.5	3 - 3.5				x					
SS-7	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-7	3 - 3.5	3 - 3.5				x					
SS-8	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-8 Dup	1 - 1.5	1 - 1.5		x		x					
SS-8	3 - 3.5	3 - 3.5				x					
SS-9	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-9	3 - 3.5	3 - 3.5				x					
SS-10	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-10	3 - 3.5	3 - 3.5				x					
SS-11	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-11	3 - 3.5	3 - 3.5				x					
SS-12	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-12	3 - 3.5	3 - 3.5				x					
SS-13	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-13	3 - 3.5	3 - 3.5				x					
SS-14	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-14	3 - 3.5	3 - 3.5				x					
SS-15	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-15	3 - 3.5	3 - 3.5				x					
SS-16	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-16	3 - 3.5	3 - 3.5				x					
SS-17	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-17	3 - 3.5	3 - 3.5				x					
SS-18	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-18	3 - 3.5	3 - 3.5				x					
SS-19	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-19	3 - 3.5	3 - 3.5				x					
SS-20	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-20	3 - 3.5	3 - 3.5		x		x					
SS-21	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-21	3 - 3.5	3 - 3.5				x					

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2007											
SS-22	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-22	3 - 3.5	3 - 3.5		x		x					
SS-22	5 - 5.5	5 - 5.5		x							
SS-23	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-23	3 - 3.5	3 - 3.5				x					
SS-24	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-24	3 - 3.5	3 - 3.5				x					
SS-25	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-25	3 - 3.5	3 - 3.5		x		x					
SS-26	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-26	3 - 3.5	3 - 3.5				x					
SS-27	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-27	3 - 3.5	3 - 3.5				x					
SS-28	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-28	3 - 3.5	3 - 3.5				x					
SS-29	1 - 1.5	1 - 1.5	Bare ground	x		x					
SS-29	3 - 3.5	3 - 3.5		x		x					
URS 2008 & 2009											
SS-30	0-0.5	0-0.5	Bare ground	x	x	x					
SS-31	0-0.5	0-0.5	Bare ground	x	x	x					
SS-32	0-0.5	0-0.5	Bare ground	x	x	x					
SS-32D	0-0.5	0-0.5	Bare ground	x	x	x					
SS-33	0-0.5	0-0.5	Bare ground	x	x	x	x	x	x		
SS-34	0-0.5	0-0.5	Bare ground	x	x	x					
SS-34D	0-0.5	0-0.5		x	x	x					SS-012109
SS-35	0-0.5	0-0.5	Bare ground	x	x	x					
SS-36	0-0.5	0-0.5	Bare ground	x	x	x					
SS-37	0-0.5	0-0.5	Bare ground	x	x	x	x	x	x		
SS-38	0-0.5	0-0.5	Bare ground	x	x	x					
SS-39	0-0.5	0.5-1	Asphalt								
SS-39	0.5-1	1-1.5		x	x	x					Slight hydrocarbon odor
SS-39	1-2	1.5-2.5			x	x					
SS-40	0-0.5	1-1.5	Asphalt	x	x	x					
SS-41	0-0.5	0.75-1.25	Asphalt								
SS-41D	0-0.5	0.75-1.25									
SS-41-2	0.5-1	1.25-1.75		x	x	x		x	x		Below abrasive grit

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-01	0-0.5	0.5-1	Asphalt	x	x	x	x	x	x		
SB-01	1-2	1.5-2.5		x	x	x					
SB-01	2-3	2.5-3.5				x					
SB-01	4-5	4.5-5.5									
SB-02	0-0.5	0.5-1	Asphalt	x	x	x	x	x	x		
SB-02	1-2	1.5-2.5		x	x	x					
SB-02	2-3	2.5-3.5								x	Elevated PID reading
SB-02	4-5	4.5-5.5									
SB-03	0-0.5	1-1.5	Asphalt	x	x	x					
SB-03	1-2	2-3		x	x	x					
SB-03	2-3	3-4									
SB-04	0-0.5	0.25-0.75	Asphalt	x	x	x					
SB-04	1-2	1.25-2.25			x	x					
SB-04	2-3	2.25-3.25									
SB-05	0-0.5	0-0.5	Bare ground	x	x	x	x	x	x		
SB-05	1-2	1-2		x	x	x	x		x		
SB-05	2-3	2-3		x	x				x		
SB-05	4-5	4-5		x							
SB-05	8-9	8-9									
SB-06	0-0.5	0.75-1.25	Concrete	x	x	x		x	x		
SB-06	1-2	1.75-2.75		x							
SB-06	2-3	2.75-3.75		x							
SB-06	4-5	4.75-5.75		x							
SB-07	0-0.5	1-1.5	Concrete	x	x	x		x	x		Black staining at the surface
SB-07	1-2	2-3		x	x			x			
SB-07	2-3	3-4		x							
SB-07	4-5	5-6		x							
SB-08	0-0.5	0.75-1.25	Concrete	x	x	x					
SB-08	0.5-1	1.25-1.75		x	x	x					
SB-08	1-2	1.75-2.75			x	x					
SB-08	2-3	2.75-3.75									
SB-08	4-5	4.75-5.75		x						x	Approximate groundwater interface
SB-09	0-0.5	0.75-1.25	Concrete	x	x	x					
SB-09	1-2	1.75-2.75			x	x					
SB-09	2-3	2.75-3.75								x	Approximate groundwater interface
SB-09	4-5	4.75-5.75		x						x	Approximate groundwater interface

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-10	0-0.5	0-0.5	Bare ground	x	x	x	x				
SB-10	1-2	1-2			x	x					
SB-10	2-3	2-3									
SB-10	3-4	3-4									
SB-10	4-5	4-5		x							
SB-11	0-0.5	0-0.5	Bare ground	x	x	x					
SB-11	1-2	1-2				x					
SB-11	2-3	2-3									
SB-11	4-5	4-5		x						x	Approximate groundwater interface, elevated PID readings
SB-12	0-0.5	0.5-1	Bare ground	x	x	x	x				
SB-12	1-2	1.5-2.5			x	x					
SB-12	2-3	2.5-3.5									
SB-12	4-5	4.5-5.5									
SB-13	0-0.5	1-1.5	Asphalt	x	x	x					
SB-13	1-2	2-3			x						
SB-13	2-3	3-4									
SB-14	0-0.5	1-1.5	Asphalt	x	x	x					
SB-14	1-2	2-3									
SB-14	2-3	3-4									
SB-15	0-0.5	0.25-0.75	Asphalt	x	x	x					
SB-15	1-2	1.25-2.25		x	x	x					
SB-15	2-3	2.25-3.25									
SB-16	0-0.5	0.75-1.25	Asphalt	x	x	x					
SB-16	1-2	1.75-2.75				x					
SB-16	2-3	2.75-3.75									
SB-16	4-5	4.75-5.75									
SB-17	0-0.5	0-0.5	Bare ground	x	x	x	x				
SB-17	1-2	1-2			x	x					
SB-17	2-3	2-3									
SB-17	5-6	5-6		x						x	Approximate groundwater interface, hydrocarbon odor, elevated PID reading, staining and sheen observed
SB-17	7-8	7-8									
SB-17	9-10	9-10		x							

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-18	0-0.5	0.75-1.25	Concrete	x	x	x					
SB-18	1-2	1.75-2.75				x					
SB-18	3-4	3.75-4.75		x	x	x					
SB-18	4-5	4.75-5.75									
SB-19	0-0.5	0.75-1.25	Concrete	x	x	x					
SB-19	1-2	1.75-2.75				x					
SB-19	2-3	2.75-3.75									
SB-19	3-4	3.75-4.75		x	x	x					
SB-19	4-5	4.75-5.75		x		x				x	Approximate groundwater interface
SB-20	0-0.5	0.75-1.25	Asphalt	x	x	x					
SB-20	1-2	1.75-2.75									
SB-20	2-3	2.75-3.75									
SB-20	4-5	4.75-5.75									
SB-21	0-0.5	1-1.5	Asphalt	x	x	x					
SB-21	1-2	2-3									
SB-21	2-3	3-4									
SB-22	0-0.5	1-1.5	Asphalt	x	x	x	x				
SB-22	1-2	2-3									
SB-22	2-3	3-4									
SB-23	1-2	1-2	Bare ground		x			x	x		
SB-23	2-3	2-3			x			x	x		
SB-24	1-2	1-2	Bare ground	x	x			x	x		
SB-24	2-3	2-3		x	x			x	x		
SB-24	3-4	3-4		x					x		
SB-25	1-2	1-2	Bare ground		x			x	x		
SB-25	2-3	2-3			x			x	x		
SB-25	3-4	3-4		x							Hydrocarbon odor observed above
SB-26	0-0.5	0.25-0.75	Asphalt	x	x	x	x	x	x		
SB-26	1-2	1.25-2.25		x	x	x		x	x		
SB-26	2-3	2.25-3.25				x					
SB-27	0-0.5	0.5-1	Concrete	x	x	x					
SB-27	1-2	1.5-2.5									
SB-27	2-3	2.5-3.5									

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-28	0-0.5	1.5-2	Concrete	x	x	x	x				
SB-28D	0-0.5	1.5-2		x	x	x	x				
SB-28	1-2	2.5-3.5				x	x				
SB-28	2-3	3.5-4.5									
SB-28	4-5	5.5-6.5								x	Approximate groundwater interface
SB-29	0-0.5	1-1.5	Asphalt	x	x	x	x	x	x		
SB-29	1-2	2-3			x	x					
SB-29	2-3	3-4		x	x	x					
SB-29	4-5	5-6				x					
SB-30	0-0.5	0.75-1.25	Asphalt	x	x	x	x	x	x		Abrasive grit present
SB-30	1-2	1.75-2.75			x	x		x	x		
SB-30	1-2D	1.75-2.75				x					
SB-30	2-3	2.75-3.75		x	x	x					
SB-30	4-5	4.75-5.75									
SB-31	0-0.5	0.25-0.75	Asphalt	x	x	x					
SB-31	1-2	1.25-2.25			x	x					
SB-31	2-3	2.25-3.25									
SB-32	0-0.5	1-1.5	Asphalt	x	x	x		x	x		Slight hydrocarbon odor
SB-32	1-2	2-3			x						
SB-32	2-3	3-4									
SB-33	0-0.5	1-1.5	Asphalt	x	x	x	x				Black staining observed
SB-33	1-2	2-3		x						x	
SB-33	2-3	3-4									
SB-34	0-0.5	0.75-1.25	Asphalt	x	x	x					
SB-34	1-2	1.75-2.75									
SB-34	2-3	2.75-3.75									
SB-35	0-0.5	0.5-1	Asphalt	x	x	x					
SB-35D	0-0.5	0.5-1		x	x	x					
SB-35	1-2	1.5-2.5		x	x	x		x	x		Hydrocarbon odor
SB-35	2-3	2.5-3.5									
SB-35D2	2-3	2.5-3.5									
SB-36	0-0.5	0.75-1.25	Asphalt	x	x	x	x				
SB-36	1-2	1.75-2.75		x	x	x		x	x	x	Hydrocarbon odor
SB-36	2-3	2.75-3.75			x						

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-37	0-0.5	1.2-1.7	Asphalt	x	x	x					
SB-37	1-2	2.2-3.2									
SB-37	2-3	3.2-4.2									
SB-38	0-0.5	1-1.5	Asphalt	x	x	x					
SB-38	1-2	2-3									
SB-38	2-3	3-4									
SB-39	0-0.5	1-1.5	Asphalt	x	x	x					
SB-39D	0-0.5	1-1.5		x	x	x					
SB-39	1-2	2-3									
SB-39	2-3	3-4									
SB-40	0-0.5	2.5-3	Concrete	x	x	x					
SB-40D	0-0.5	2.5-3		x	x	x					
SB-40	1-2	3.5-4.5			x						
SB-40	2-3	4.5-5.5									
SB-41	0-0.5	2.25-2.75	Concrete	x	x	x					
SB-41	1-2	3.25-4.25									
SB-41	2-3	4.25-5.25									
SB-42	0-0.5	0.5-1	Asphalt	x	x	x		x	x		
SB-42	1-2	1.5-2.5			x						
SB-42	2-3	2.5-3.5			x						
SB-43	1-2	1-2	Bare ground		x	x					
SB-43	2-3	2-3				x					
SB-44	0-0.5	1-1.5	Asphalt		x	x					
SB-44	2-3	3-4									
SB-45	0-0.5	1-1.5	Asphalt		x	x					
SB-45	2-3	3-4									
SB-46	0-0.5	1-1.5	Asphalt		x	x					
SB-46	2-3	3-4									
SB-47	0-0.5	1-1.5	Asphalt		x	x					
SB-47	2-3	3-4									
SB-47D	2-3	3-4									
SB-48	0-0.5	0-0.5	Bare ground		x	x					
SB-48D	0-0.5	0-0.5			x	x					
SB-48	2-3	2-3			x	x					
SB-49	0-0.5	0-0.5	Bare ground		x	x			x		
SB-49	2-3	2-3				x					

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-50	0-0.5	0-0.5	Bare ground		x	x					
SB-50	2-3	2-3									
SB-51	0-0.5	0-0.5	Bare ground		x	x			x		
SB-51	2-3	2-3									
SB-52	0-0.5	0-0.5	Bare ground		x	x			x		
SB-52	2-3	2-3									
SB-53	0-0.5	0-0.5	Elevated flooring	x	x	x					
SB-53	2-3	2-3				x					
SB-54	0-0.5	0-0.5	Elevated flooring	x	x	x			x		
SB-54	2-3	2-3			x	x					
SB-55	0-0.5	1.25-1.75	Concrete		x	x			x		
SB-55D	0-0.5	1.25-1.75			x	x					
SB-55	2-3	3.25-4.25				x					
SB-56	0-0.5	0.75-1.25	Asphalt		x	x			x		
SB-56	2-3	2.75-3.75									
SB-57	0-0.5	0.75-1.25	Asphalt		x	x			x		
SB-57	2-3	2.75-3.75									
SB-58	0-0.5	1-1.5	Concrete		x	x					
SB-58	2-3	3-4									
SB-59	0-0.5	0.75-1.25	Concrete		x	x					
SB-59D	0-0.5	0.75-1.25			x	x					
SB-59	2-3	2.75-3.75									
SB-60	0-0.5	0.25-0.75	Elevated flooring	x	x	x					
SB-60	2-3	2.25-3.25				x					
SB-61	0-0.5	0.15-0.65	Elevated flooring	x	x	x			x		
SB-61	2-3	2.15-3.15			x	x					
SB-62	SS	0.75-1.25	Concrete		x						
SB-62	0-0.5	1.25-1.75		x	x	x					
SB-62D	0-0.5	1.25-1.75		x	x	x					
SB-62	2-3	2.5-3.5		x	x	x					
SB-62D2	2-3	2.5-3.5		x	x	x					
SB-63	SS	0.75-1.25	Concrete		x						
SB-63	0-0.5	1.5-2		x	x	x					
SB-63	2-3	3-4									

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-64	SS	0.5-1	Concrete		x						
SB-64	0-0.5	1-1.5		x	x	x					
SB-64	2-3	3-4			x						
SB-65	SS	0.5-1	Concrete		x						
SB-65	0-0.5	1-1.5		x	x	x					
SB-65	2-3	3-4			x						
SB-66	SS	0.75-1.15	Concrete	x	x						
SB-66	0-0.5	1.15-1.65		x	x	x					
SB-66	2-3	3-4				x					
SB-67	SS	0.5-0.75	Concrete		x				x		
SB-67D	SS	0.5-0.75									
SB-67	0-0.5	0.75-1.25		x	x	x			x		
SB-67D2	0-0.5	0.75-1.25									
SB-67	2-3	3-4				x					
SB-68	SS	0.75-1.15	Concrete		x				x		
SB-68	0-0.5	1.15-1.65		x	x	x			x		
SB-68	2-3	3-4									
SB-69	SS	0.75-1.25	Concrete	x	x						
SB-69	0-0.5	1.25-1.75		x	x	x					
SB-69	2-3	3-4			x	x					
SB-70	SS	0.75-1.15	Concrete		x						
SB-70	0-0.5	1.15-1.65		x	x	x					
SB-70	2-3	3-4									
SB-71	SS	1-1.5	Concrete	x	x	x					
SB-71	0-0.5	1.5-2									
SB-71	2-3	3-4		x							
SB-72	0-0.5	1.25-1.75	Asphalt	x	x	x			x		
SB-72	2-3	3.5-4.5			x	x					
SB-73	SS	0.75-1	Concrete		x				x		
SB-73	0-0.5	1-1.5		x	x	x			x		
SB-73	2-3	3-4		x							
SB-74	SS	0.75-1	Concrete								
SB-74	0-0.5	1-1.5		x	x	x			x	x	
SB-74	2-3	3-4		x					x		
SB-75	0-0.5	2.5-3	Concrete	x	x	x			x		
SB-75	2-3	4-5			x	x			x		

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-76	0-0.5	1.5-2	Concrete	x	x	x			x		
SB-76	2-3	3.5-4.5			x	x					
SB-77	0-0.5	1.5-2	Concrete	x	x	x			x		
SB-77	2-3	3.5-4.5			x	x			x		
SB-78	0-0.5	1.5-2	Concrete	x	x	x			x		
SB-78	2-3	3.5-4.5			x	x			x		
SB-79	0-0.5	1-1.5	Concrete	x	x	x			x		
SB-79D	0-0.5	1-1.5		x	x	x			x		
SB-79	2-3	3-4			x	x			x		
SB-80	0-0.5	1.5-2	Asphalt		x	x			x		
SB-80	2-3	3.25-4.25			x				x		
SB-81	0-0.5	0.75-1.25	Asphalt		x	x			x		
SB-81	1-2	1.75-2.75		x	x	x					
SB-81	2-3	2.75-3.75			x						
SB-82	0-0.5	2-2.5	Asphalt		x	x					
SB-82	2-3	4-5									
SB-83	0-0.5	1.5-2	Asphalt		x	x			x		
SB-83	2-3	3.25-4									
SB-84	0-0.5	1-1.5	Asphalt	x	x	x					
SB-84	2-3	3-4			x						
SB-85	0-0.5	1-1.5	Asphalt	x	x	x					
SB-85	2-3	3-4			x						
SB-86	0-0.5	1.25-1.75	Asphalt	x	x	x					
SB-86	2-3	3.25-4.25									
SB-87	0-0.5	1.5-2	Asphalt		x	x					
SB-87	2-3	2.75-3.75									
SB-88	SS	1.25-1.75	Concrete						x		
SB-88	0-0.5	1.75-2.25			x	x			x		
SB-88	2-3	3-4			x						
SB-89	SS	0.5-1.25	Concrete		x	x					
SB-89	0-0.5	1.25-2			x						
SB-90	SS	0.5-1	Concrete								
SB-90	0-0.5	1-1.5			x	x					
SB-90	2-3	3-4									
SB-91	0-0.5	0.75-1.25	Asphalt		x	x					
SB-91	2-3	2.75-3.75			x						

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2008 & 2009											
SB-92	0-0.5	1-1.5	Asphalt		x	x					
SB-92	2-3	3.5-4.5				x					
MW-4	0-0.5	1-1.5	Asphalt	x	x	x					
MW-4	1-2	2-3				x					
MW-4	2-3	3-4									
MW-5	0-0.5	1-1.5	Asphalt	x	x	x					
MW-5	1-2	2-3				x					
MW-5	2-3	3-4									
MW-6	0-0.5	0.75-1.25	Asphalt	x	x	x					
MW-6	1-2	1.75-2.75				x					
MW-6	2-3	2.75-3.75									
MW-7	0-0.5	0-0.5	Bare ground	x	x	x	x	x	x		
MW-7	1-2	1-2			x	x	x		x		
MW-7	2-3	2-3				x					
MW-7	3-4	3-4				x					
MW-8	0-0.5	0.75-1.25	Asphalt	x	x	x					
MW-8	1-2	1.75-2.75			x	x					
MW-8	2-3	2.75-3.75			x	x					
MW-9	0-0.5	0.75-1.25	Asphalt	x	x	x		x	x		
MW-9	1-2	1.75-2.75			x	x			x		
MW-9	2-3	2.75-3.75			x						
MW-9	4-5	4.75-5.75			x						
URS 2010											
SB-93A	5-6	6-7	Asphalt	x							
SB-93A	9-10	10-11		x							
SB-93A	14-15	15-16		x							
SB-93	7-8	8-9	Asphalt	x						x	
SB-93	9-10	10-11		x						x	
SB-93	13-14	14-15		x						x	
SB-94	4-5	6-7	Asphalt	x						x	
SB-94	9-10	11-12		x						x	
SB-94	14-15	16-17		x						x	
SB-95	7-8	8.5-9.5	Asphalt	x						x	
SB_95	10-11	11.5-12.5		x						x	
SB-95	13-14	14.5-15.5		x						x	
SB-96	7-8	8-9	Asphalt	x							
SB-96	10-11	11-12		x							
SB-96	13-14	14-15		x							

Table 2-2
Summary of Soil Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Sample ID Depth Interval (ft)	Actual Sample Depth (ft below ground surface)	Ground Surface Material	TPH	cPAHs	Metals	Organotins	SVOCs	PCBs	VOCs	Rationale for discretionary analysis
URS 2010											
SB-97	6-7	7-8	Asphalt	x							
SB-97	10-11	11-12		x							
SB-97	13-14	14-15		x							
SB-98	5-6	6.5-7.5	Asphalt	x							
SB-98	9-10	10.5-11.5		x							
SB-98	14-15	15.5-16.5		x							
SB-100	4-5	6-7	Asphalt	x							
SB-100	9-10	11-12		x							
SB-100	13-14	15-16		x							
SB-101	4-5	6-7	Asphalt	x							
SB-101	14-15	16-17		x							
SB-102	4-5	6-7	Asphalt	x							
SB-102	10-11	12-13		x							
SB-102	13-14	15-16		x							
SB-103	5-6	7-8	Asphalt	x							
SB-103	9-10	11-12		x							
SB-103	12-13	14-15		x							
SB-104	4-5	6-7	Asphalt	x							
SB-105	5-6	7-8	Asphalt	x							
SB-105	10-11	12-13		x							
SB-106	4-5	6.5-7.5	Asphalt	x							
SB-106	9-10	11.5-12.5		x							
SB-106	13-14	15.5-16.5		x							
SB-107	4-5	6.5-7.5	Asphalt	x							
SB-107	9-10	11.5-12.5		x							
SB-107	12-13	14.5-15.5		x							

Notes:
x - indicates analysis was requested for sample location and depth interval
TPH - Total petroleum hydrocarbons
cPAHs - Carcinogenic polycyclic aromatic hydrocarbons
SVOCs - Semi-volatile organic compounds
PCBs - Polychlorinated biphenyls
VOCs - Volatile organic compounds
D in the depth interval indicates a field duplicate was collected and analyzed
SS sample depth indidcates sample was collected immediately below a concrete slab
Sample IDs are a combination of the location and depth interval

Table 2-3
Groundwater Monitoring Well Construction Details and Water Level Measurements
Everett Shipyard
Everett, Washington
RI/FS

				January 6, 2009 Depth to Groundwater (ft btoc)		January 6, 2009 Groundwater Elevation (ft msl)		April 1, 2009 Depth to Groundwater (ft btoc)		April 1, 2009 Groundwater Elevation (ft msl)		July 9, 2009 Depth to Groundwater (ft btoc)		July 9, 2009 Groundwater Elevation (ft msl)		October 13, 2009 Depth to Groundwater (ft btoc)		October 13, 2009 Groundwater Elevation (ft msl)	
	Total Depth	**Screen Interval**	**Top of Casing Elevation**		low tide		low tide		low tide		low tide		low tide		low tide	low tide		low tide	
Monitor Well	**(ft bgs)**	**(ft bgs)**	**(ft NAVD88)**	**1:30 PM**	**7:25 PM**	**1:30 PM**	**7:25 PM**	**11:15 AM**	**4:25 PM**	**11:15 AM**	**4:25 PM**	**10:30 AM**	**2:00 PM**	**10:30 AM**	**2:00 PM**	**6:45 AM**	**9:15 AM**	**6:45 AM**	**9:15 AM**
MW-1	15	4.5-14.5	12.84	2.96	2.98	9.88	9.86	3.61	3.59	9.23	9.25	4.49	4.22	8.35	8.62	4.53	4.50	8.31	8.34
MW-2	15.2	4.75-14.75	13.84	2.76	3.01	11.08	10.83	3.70	4.56	10.14	9.28	5.02	5.15	8.82	8.69	5.21	5.25	8.63	8.59
MW-4	13	3-13	15.09	4.09	6.11	11.00	8.98	6.69	6.69	8.40	8.40	7.25	7.25	7.84	7.84	7.58	7.60	7.51	7.49
MW-5	12.5	2.5-12.5	14.81	3.14	5.93	11.67	8.88	6.55	6.61	8.26	8.20	7.12	7.18	7.69	7.63	7.48	7.49	7.33	7.32
MW-6	12.5	2.5-12.5	13.31	3.79	3.61	9.52	9.70	4.94	5.19	8.37	8.12	NM	NM	NM	NM	5.93	6.02	7.38	7.29
MW-7	12.5	2.5-12.5	15.15	3.83	3.84	11.32	11.31	5.24	5.20	9.91	9.95	6.32	6.35	8.83	8.80	6.68	5.65	8.47	9.50
MW-8	12.5	2.5-12.5	14.88	3.22	5.11	11.66	9.77	4.94	4.85	9.94	10.03	5.60	5.63	9.28	9.25	5.89	5.24	8.99	9.64
MW-9	13	2.9-12.9	15.54	5.24	5.32	10.30	10.22	5.76	5.72	9.78	9.82	6.04	6.03	9.50	9.51	NM	6.26	NM	9.28
MW-10	12.5	2.5-12.5	15.33	5.68	NM	9.65	NM	5.36	5.28	9.97	10.05	5.73	5.72	9.60	9.61	5.81	5.81	9.52	9.52

Notes:
ft = feet
bgs = below ground surface
btoc = below top of casing
msl = mean sea level
NAVD88 = North American Vertical Datum of 1988, in feet
NM = not measured, well was not accessible during water level sweep following low tide
An interface probe was used to check for the presence of non-aqueous phase liquid (NAPL) in each well prior to each sampling event. NAPL was not detected in any of the wells.
MW-1 & MW-2 were originally surveyed in a different vertical datum than MW-4 through MW-10.
For purposes of comparison, MW-1 & MW-2 reference elevations were converted to NAVD88 using VERTCON by US Army Corps of Engineers.
Groundwater level measurements were collected within a 45 minute period beginning at the time listed above.
January 6, 2009: High tide of 11.4' at 11:07 AM, low tide of -0.3' at 6:46 PM.
April 1, 2009: High tide of 10.2' at 8:32 AM, low tide of -1.0' at 4:08 PM.
July 9, 2009: High tide of 9.3' at 5:44 AM, low tide of -1.1' at 12:51 PM.
October 13, 2009: High tide of 8.4' at 12:00 AM, low tide of 0.8' at 6:54 AM.
Tidal elevations are in feet relative to mean lower low water (MLLW).

Table 2-4
Summary of Groundwater Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	Well Type	TPH	cPAHs	PCBs	Organotins	SVOCs	VOCs	Total Metals	Dissolved Metals	TDS
March 2003										
LB4	Temporary	x							x	
LB5	Temporary	x				x	x		x	
LB6	Temporary	x					x			
LB7	Temporary	x					x			
LB8	Temporary	x								
MW1	Permanent	x				x	x	x		
MW2	Permanent	x				x	x	x		
MW3	Permanent	x						x		
November 2008										
SB-01	Temporary	x							x	
SB-07	Temporary	x	x			x	x		x	
SB-08	Temporary	x							x	
SB-09	Temporary	x							x	
SB-10	Temporary	x					x	x	x	
SB-11	Temporary	x					x		x	
SB-19	Temporary	x	x			x	x		x	
January 2009										
MW-01	Permanent	x	x	x	x	x	x	x	x	x
MW-02	Permanent	x	x	x	x	x	x	x	x	x
MW-04	Permanent	x	x	x	x	x	x	x	x	x
MW-05	Permanent	x	x	x	x	x	x	x	x	x
MW-06	Permanent	x	x	x	x	x	x	x	x	x
MW-07	Permanent	x	x	x	x	x	x	x	x	x
MW-08	Permanent	x	x	x	x	x	x	x	x	x
MW-09	Permanent	x	x	x	x	x	x	x	x	x
MW-10	Permanent	x	x	x	x	x	x	x	x	x
April 2009										
MW-01	Permanent	x	x	x	x	x	x	x	x	x
MW-02	Permanent	x	x	x	x	x	x	x	x	x
MW-04	Permanent	x	x	x	x	x	x	x	x	x
MW-05	Permanent	x	x	x	x	x	x	x	x	x
MW-06	Permanent	x	x	x	x	x	x	x	x	x
MW-07	Permanent	x	x	x	x	x	x	x	x	x
MW-08	Permanent	x	x	x	x	x	x	x	x	x
MW-09	Permanent	x	x	x	x	x	x	x	x	x
MW-10	Permanent	x	x	x	x	x	x	x	x	x
July 2009										
MW-02	Permanent					x	x	x	x	
MW-04	Permanent					x	x	x	x	
MW-07	Permanent					x	x	x	x	
October 2009										
SB-43	Temporary					x	x		x	
MW-02	Permanent					x	x	x	x	
MW-04	Permanent					x	x	x	x	
MW-06	Permanent					x	x	x	x	
MW-07	Permanent					x	x	x	x	
June 2010										
SB-93	Temporary	x					x			
SB-94	Temporary	x					x			
SB-95	Temporary	x					x			

Notes:
x - indicates analysis was requested
TPH - Total petroleum pydrocarbons
cPAHs - Carcinogenic polycyclic aromatic hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semi-volatile organic compounds
VOCs - Volatile organic compounds
TDS = Total Dissolved solids

Table 2-5
Summary of Marine Sediment Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	HCID	NWTPH	VOCs	SVOCs	Pesticides	PCBs	Organotins	Organotins-Porewater	Metals	Ammonia	Total Sulfides	Total Solids	TOC	Bioassays
Landau 2003														
MS-1-0-0.3				x			x	x	x			x	x	
MS-2-0-0.3				x			x	x	x			x	x	
MS-3-0-0.3			x	x		x	x	x	x			x	x	
MS-4-0-0.3				x				x	x			x	x	
MS-5-0-0.3				x		x		x	x			x	x	
MS-6-0-0.3				x				x	x			x	x	
Landau 2004														
NMA-grab 3				x				x	x			x	x	
NMA-grab 4				x			x	x	x			x	x	
NMA-grab 5				x				x	x			x	x	
NMA-grab 6				x				x	x			x	x	
NMA-grab 7				x			x	x	x			x	x	
NMA-grab 8				x			x	x	x			x	x	
NMA-grab 9				x			x	x	x			x	x	
NMA-grab 10				x				x	x			x	x	
NMA-core 1-0.5-2				x			x		x			x	x	
NMA-core 1-2-3.9				x			x		x			x	x	
NMA-core 2-0.5-3.2				x			x		x			x	x	
NMA-core 2-3.2-6.3				x			x		x			x	x	
NMA-core 3-0.5-1.8				x			x		x			x	x	
NMA-core 3-1.8-3.1				x			x		x			x	x	
NMA-core 4-0.5-3				x			x		x			x	x	
NMA-core 4-3-6				x			x		x			x	x	
NMA-core 5-0.5-1.4				x			x		x			x	x	
NMA-core 5-1.4-2.3				x			x		x			x	x	
NMA-core 6-0.5-2				x			x		x			x	x	
URS 2009														
SC-1-3								x	x	x	x	x	x	
SC-1-5			x	x	x	x	x	x	x	x	x	x	x	
SC-1-7			x	x	x	x	x	x	x	x	x	x	x	
SC-2-2.5			x	x	x	x	x	x	x	x	x	x	x	
SC-2-4			x	x	x	x	x	x	x	x	x	x	x	
SC-3-1								x	x	x	x	x	x	
SC-3-3								x	x	x	x	x	x	
SC-3-5			x	x	x	x	x	x	x	x	x	x	x	
SC-4-2								x	x	x	x	x	x	

Table 2-5
Summary of Marine Sediment Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	HCID	NWTPH	VOCs	SVOCs	Pesticides	PCBs	Organotins	Organotins-Porewater	Metals	Ammonia	Total Sulfides	Total Solids	TOC	Bioassays
SC-5-2			x	x	x	x	x	x	x	x	x	x	x	
SC-5-4			x	x	x	x	x	x	x	x	x	x	x	
SC-6-2								x	x	x	x	x	x	
SC-6-3.5			x	x	x	x	x	x	x	x	x	x	x	
SG-01			x	x	x	x	x	x	x	x	x	x	x	
SG-02			x	x	x	x	x	x	x	x	x	x	x	
SG-03			x	x	x	x	x	x	x	x	x	x	x	
SG-04			x	x	x	x	x	x	x	x	x	x	x	
SG-05			x	x	x	x	x	x	x	x	x	x	x	
SG-05D			x	x	x	x	x	x	x	x	x	x	x	
SG-06			x	x	x	x	x	x	x	x	x	x	x	
SG-07			x	x	x	x	x	x	x	x	x	x	x	
SG-08			x	x	x	x	x	x	x	x	x	x	x	
SG-09			x	x	x	x	x	x	x	x	x	x	x	
SG-10			x	x	x	x	x	x	x	x	x	x	x	
SG-11			x	x	x	x	x	x	x	x	x	x	x	
SG-12			x	x	x	x	x	x	x	x	x	x	x	
SG-13			x	x	x	x	x	x	x	x	x	x	x	
SG-14			x	x	x	x	x	x	x	x	x	x	x	
SG-15			x	x	x	x	x	x	x	x	x	x	x	
SG-16			x	x	x	x	x	x	x	x	x	x	x	
SG-17			x	x	x	x	x	x	x	x	x	x	x	
SG-18			x	x	x	x	x	x	x	x	x	x	x	
SG-19			x	x	x	x	x	x	x	x	x	x	x	
SG-20			x	x	x	x	x	x	x	x	x	x	x	
SG-20D			x	x	x	x	x	x	x	x	x	x	x	
SG-21			x	x	x	x	x	x	x	x	x	x	x	
SG-22			x	x	x	x	x	x	x	x	x	x	x	
SG-23			x	x	x	x	x	x	x	x	x	x	x	
SG-24								x	x	x	x	x	x	
SG-25								x	x	x	x	x	x	
SG-26								x	x	x	x	x	x	
SG-27								x	x	x	x	x	x	
SG-28			x	x	x		x	x		x	x	x	x	

Table 2-5
Summary of Marine Sediment Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	HCID	NWTPH	VOCs	SVOCs	Pesticides	PCBs	Organotins	Organotins-Porewater	Metals	Ammonia	Total Sulfides	Total Solids	TOC	Bioassays
SG-29			x	x	x		x	x		x	x	x	x	
SG-30			x	x	x		x	x		x	x	x	x	
SG-31										x	x	x	x	x
SG-32			x	x	x					x	x	x	x	
SG-33			x	x	x					x	x	x	x	
SG-34			x	x	x					x	x	x	x	
SG-35										x	x	x	x	x
SG-FD			x	x	x		x	x		x	x	x	x	
URS 2010														
SG-36										x	x	x	x	x
SG-37										x	x	x	x	x
SG-38										x	x	x	x	
SG-39										x	x	x	x	
SG-40										x	x	x	x	
SG-41										x	x	x	x	
SG-42										x	x	x	x	
SG-43										x	x	x	x	
SG-44										x	x	x	x	
SG-45										x	x	x	x	
SG-46										x	x	x	x	
SG-47										x	x	x	x	x
BC-1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	
BC-1-2	x	x	x	x	x	x	x		x	x	x	x	x	
BC-2-1			x	x	x	x	x	x	x	x	x	x	x	
BC-2-2	x	x	x	x	x	x	x		x	x	x	x	x	
BC-FD			x	x	x	x	x	x	x	x	x	x	x	
BC-3-1			x	x	x	x	x	x	x	x	x	x	x	
BC-3-2			x	x	x	x	x		x	x	x	x	x	
BC-4-1	x	x	x	x	x	x	x	x	x	x	x	x	x	
BC-4-2			x	x	x	x	x		x	x	x	x	x	
BC-5-1			x	x	x	x	x	x	x	x	x	x	x	
BC-5-2			x	x	x	x	x		x	x	x	x	x	
BC-6-1			x	x	x	x	x	x	x	x	x	x	x	
BC-6-2			x	x	x	x	x		x	x	x	x	x	
BC-7-1	x													
BC-7-2		x												
BC-8-1	x													

Table 2-5
Summary of Marine Sediment Analyses
Everett Shipyard
Everett, Washington
RI/FS

Location	HCID	NWTPH	VOCs	SVOCs	Pesticides	PCBs	Organotins	Organotins-Porewater	Metals	Ammonia	Total Sulfides	Total Solids	TOC	Bioassays
BC-8-2		x												
BC-9-1	x													
BC-9-2														
BC-10-1	x													
BC-10-2		x												

Notes:
x - indicates analysis was requested for sample location and depth interval
SVOCs - Semi-volatile organic compounds
PCBs - Polychlorinated biphenyls
VOCs - Volatile organic compounds
TOC = Total organic carbon
D in the depth interval indicates a field duplicate was collected and analyzed
SC - indicates sediment core samples with depth interval in feet following location ID
SG - indicates sediment grab sample

Table 3-1
Summary of Catch Basin Assessment
Everett Shipyard
Everett, Washington
RI/FS

Catch Basin	Estimated Volume of Accumulated Solids (ft^3)	Depth of Catch Basin (ft)	Discharges to North Marina?	Additional Observations
Outfall A				
Outfall A-CB	<1	<1	Yes	
Outfall 001				
Outfall 001-CB	0	5	Yes	Inflow pipe is plugged.
Outfall 001-CB1	1	5	Yes	
Outfall 002				
Outfall 002-CB1	0	2		Clogged or partially blocked - connectivity to North Marina could not be evaluated.
Outfall B				
Outfall B-CB	3	5	Yes	
Outfall B-CB1	<1	5	Yes	
Outfall B-CB2	<1	5	Yes	
Outfall B-CB3	<1	5	Yes	
Outfall B-CB4	<1	5	Yes	
Outfall B-CB5	NM	NM	Yes	Catch basin had been fitted with a geotextile filter sediment trap that was not removed.
Sanitary Sewer				
Outfall SS	0	NM	No	Sump pump transfers water to Everett Shipyard stormwater treatment system prior to discharge to sanitary sewer system.
Outfall SS-1	4	2	No	Clogged, but backed up with water when testing Outfall SS-2. Based on this connection, this drain appears to discharge to sanitary sewer system.
Outfall SS-2	3	4	No	
Unknown Discharge Point				
Outfall UNK	<1	3	No	Everett Shipyard staff reports sump pump connects to onsite stormwater treatment system.
Outfall UNK-1	0	5		Clogged - connectivity to North Marina could not be evaluated.
Outfall UNK-2	0	1	No	No discharge observed.
Outfall UNK-3	0	1.5	No	No discharge observed.
Outfall UNK-4	6	4	No	No discharge observed.
Outfall UNK-5	2	3	No	No discharge observed.
Outfall UNK-6	3	4	No	No discharge observed.
Outfall UNK-7	<1	4		Sump pump, hose and electrical wiring observed; catch basin is most likely a closed-end sump.
Outfall UNK-8	NM	NM		Clogged and electrical wiring observed; catch basin is most likely a closed-end sump.

Notes:
NM - Not measured
ft^3 - cubic feet
ft - feet

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	BSS-1	BSS-1	BSS-2	BSS-3	BSS-3	BSS-4	BSS-4	LB1/MW-1		LB2/MW-2	LB9	LB10	LB11	LB12	LB13	LB14	MW-4	MW-4	MW-5	MW-5	MW-6	MW-6
Sample ID Depth Interval (feet bgs):		1.0 - 1.5	3.0 -3.5	1.0 - 1.5	1.0 - 1.5	2.5 - 3.0	1.0 - 1.5	3.0 - 3.5	0 - 1		0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2
Date Collected:		4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	3/7/2003		3/7/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Field QC:										Field Duplicate													
TPH (mg/kg)																							
Diesel-range**	$2,000^{a}$	5.4 U	5.4 U	33*	6.2*	180*	5.2 U	NA	25U	25U	25U	7.6	19	43	15	58	140	13	NA	13	NA	14	NA
Oil-range**	$2,000^{a}$	36	11 U	200	51	1,100	10 U	NA	50U	50U	50U	15	200	250	35	170	510	110	NA	160	NA	57	NA
cPAHs (ug/kg)																							
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	91	24	29	NA	11	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	140	48	48	NA	20	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	110	34	32	NA	11	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	36	32	NA	11	NA
Benzo(a)pyrene**	140^{b}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	41	52	NA	13	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70	24	16	NA	9.6	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35	24 U	9.6 U	NA	4.6	NA
TTEC**	140^{b}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**172**	53	63	NA	18	NA
PCBs (ug/kg)																							
Aroclor 1016	$5,600^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	$1,600^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	$1,000^{a}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																							
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																							
Antimony**	32^{b}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	NA	5 U	NA	6 U	NA
Arsenic**	20^{a}	2.40	5.79	4.38	4.77	5.99	2.54	NA	3.0U	2.8U	3.0U	NA	NA	NA	NA	NA	NA	8	NA	9	NA	6 U	NA
Cadmium	80^{b}	0.535 U	0.561 U	0.498 U	1.49	0.533 U	0.507 U	NA	0.50U	0.47U	0.51U	NA	NA	NA	NA	NA	NA	0.2	NA	0.2	NA	0.2 U	NA
Chromium	$120,200\ (Cr^{3+})^{b}/240\ (Cr^{6+})^{b}$	NA	NA	NA	NA	NA	NA	NA	18	17	13	NA	NA	NA	NA	NA	NA	22.2	NA	28.3	NA	23.9	NA
Copper**	$3,200^{b}$	10.7 J	9.02 J	22.3 J	13.3 J	19.2 J	5.70	5.76	19	16	9.3	NA	NA	NA	NA	NA	NA	21.9	NA	37.1	7.9	38.6	10.8
Lead**	250^{a}	4.29	1.80	13.0	3.88	14.2	1.40	NA	6.0U	5.6U	6.1U	NA	NA	NA	NA	NA	NA	18	NA	28	NA	26	NA
Nickel	$1,600^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32	NA	32	NA	24	NA
Zinc	$24,000^{b}$	35.2 J	32.3 J	163 J	198	71.8 J	20.6	20.9	28	25	18	NA	NA	NA	NA	NA	NA	42	NA	61	NA	48	NA
VOCs (ug/kg)																							
Methylene chloride	$130,000^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	$3,200^{d}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	$5,600^{d}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30^{a}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	$1,900^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	$7,000^{a}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	$6,000^{a}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	$9,000^{a,f}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	$16,000,000^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	$800,000^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE^{b}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	$8,000,000^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	$5,000^{a}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																							
Pentachlorophenol	$2,500^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	$71,000^{b}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	MW-7	MW-7	MW-7	MW-7	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	SB-01	SB-01	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03
Sample ID Depth Interval (feet bgs):		0 - 0.5	1 - 2	2 - 3	3 - 4	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2
Date Collected:		12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/1/2008	12/1/2008
Field QC:																					
TPH (mg/kg)																					
Diesel-range**	2,000[a]	140	NA	NA	NA	24	NA	NA	74	NA	NA	NA	5.7 U	6.3 U	NA	6.8 U	20	5.7 U	NA	18	5.4 UJ
Oil-range**	2,000[a]	420	NA	NA	NA	140	NA	NA	350	NA	NA	NA	11 U	13 U	NA	14 U	61	11 U	NA	58	11 UJ
cPAHs (ug/kg)																					
Benzo(a)anthracene	See Note c	400 J	4.6 U	NA	NA	75	80	160 J	1,000 J	68 J	92 J	11 J	4.7 U	4.8 U	NA	NA	18	4.8 U	NA	220	4.6 U
Chrysene	See Note c	520 J	4.6 U	NA	NA	130	120	200 J	1,200	82 J	120 J	12 J	4.7 U	4.8 U	NA	NA	23	4.8 U	NA	260	4.6 U
Benzo(b)fluoranthene	See Note c	570 J	4.6 U	NA	NA	86	79	130 J	1,400	52 J	94 J	11 J	4.7 U	4.8 U	NA	NA	18	4.8 U	NA	160	4.6 U
Benzo(k)fluoranthene	See Note c	490 J	4.6 U	NA	NA	88	79	130 J	1,100	65 J	94 J	11 J	4.7 U	4.8 U	NA	NA	18	4.8 U	NA	200	4.6 U
Benzo(a)pyrene**	140[b]	**470 J**	4.6 U	NA	NA	93	100	**170J**	**1,300 J**	86 J	120 J	12 J	4.7 U	4.8 U	NA	NA	22 J	4.8 U	NA	**250**	4.6 U
Indeno(1,2,3-cd)pyrene	See Note c	160 J	4.6 U	NA	NA	64 U	66	87 J	740 J	43	91 J	8.9 J	4.7 U	4.8 U	NA	NA	15	4.8 U	NA	120	4.6 U
Dibenzo(a,h)anthracene	See Note c	61 U	4.6 U	NA	NA	64 U	29	43 J	220	18	37 J	4.7 UJ	4.7 U	4.8 U	NA	NA	6.4	4.8 U	NA	65	4.6 U
TTEC**	140[b]	**637 J**	NA	NA	NA	119	135	**227 J**	**1,758 J**	111 J	**162 J**	16 J	NA	NA	NA	NA	30 J	NA	NA	**329**	NA
PCBs (ug/kg)																					
Aroclor 1016	5,600[b]	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA	30 U	NA	NA	NA	NA
Aroclor 1242	NE	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA	30 U	NA	NA	NA	NA
Aroclor 1248	NE	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA	30 U	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	1,200 J	31 UJ	NA	NA	NA	NA	NA	320 J	30 UJ	NA	NA	33 U	NA	NA	NA	66	NA	NA	NA	NA
Aroclor 1260	NE	310 UJ	31 UJ	NA	NA	NA	NA	NA	200 J	30 UJ	NA	NA	33 U	NA	NA	NA	34	NA	NA	NA	NA
Aroclor 1221	NE	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA	30 U	NA	NA	NA	NA
Aroclor 1232	NE	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA	30 U	NA	NA	NA	NA
Total PCBs**	1,000[a]	**1,200 J**	NA	NA	NA	NA	NA	NA	520 J	NA	NA	NA	NA	NA	NA	NA	100	NA	NA	NA	NA
Organotins (ug/kg)																					
Tributyltin as TBT Ion	7,400	1,800	6.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 U	NA	NA	NA	59 J	NA		NA	NA
Dibutyl Tin Ion	NE	930	5.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	82 J	NA		NA	NA
Butyl Tin Ion	NE	360	3.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4 U	NA	NA	NA	66	NA		NA	NA
Metals (mg/kg)																					
Antimony**	32[b]	20	5 U	NA	NA	5 U	NA	NA	**80**	5 UJ	NA	NA	6 U	6 U	NA	NA	18	5 U	NA	5 UJ	NA
Arsenic**	20[a]	**210**	17	NA	NA	19	NA	NA	**510**	10	NA	NA	6	6	NA	NA	**94**	6	NA	7	NA
Cadmium	80[b]	1.7	0.5	NA	NA	0.3	NA	NA	3.5	0.2 U	NA	NA	0.2 U	0.3	NA	NA	0.4	0.2 U	NA	0.3 J	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	72	64.1	29.7	NA	26.8	NA	NA	101	25.1	NA	NA	24.1	28.8	30.0	NA	29.6	24.4	NA	29.9	NA
Copper**	3,200[b]	2,410	66.7	292 J	18.7	56.1	549 J	187	1,430	25.3 J	NA	NA	12.0	17.1	18.4	NA	246	10.1	NA	38.3	7.1
Lead**	250[a]	**336**	16	NA	NA	42	NA	NA	**619**	12 J	NA	NA	3	4	NA	NA	121	3	NA	43 J	NA
Nickel	1,600[b]	31	29	NA	NA	33	NA	NA	44	NA	NA	NA	23	55	33	NA	24	28	NA	35	NA
Zinc	24,000[b]	1,790	195	404	51	111	283	258	2,670	78	NA	NA	29	69	41	NA	324	32	NA	84	NA
VOCs (ug/kg)																					
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5 U	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18 U	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.0	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.2 U	NA	NA
SVOCs (ug/kg)																					
Pentachlorophenol	2,500[b]	330 UJ	NA	NA	NA	NA	NA	NA	300 UJ	NA	NA	NA	320 U	NA	NA	NA	300 U	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	490 J	NA	NA	NA	NA	NA	NA	860 J	NA	NA	NA	64 U	NA	NA	NA	60 U	NA	NA	NA	NA

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cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
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[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID: / Sample ID Depth Interval (feet bgs): / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-04	SB-04	SB-05	SB-05	SB-05[e]	SB-05[e]	SB-06	SB-06	SB-06	SB-06	SB-07	SB-07	SB-07	SB-07	SB-08	SB-08	SB-08	SB-09	SB-09	SB-09	SB-09	SB-10	SB-10	SB-10
Sample ID Depth Interval (feet bgs)		0 - 0.5	1 - 2	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	4 - 5
Date Collected		12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/11/2008	12/11/2008	12/11/2008
TPH (mg/kg)																									
Diesel-range**	2,000[a]	41	NA	190	5.7 UJ	360 J	230	1,000	1,200	240 J	5.8 UJ	**2,300**	**2,400**	1,100 J	12	73	NA	6.9 U	5.2 U	NA	NA	6.5 U	240	NA	49
Oil-range**	2,000[a]	160	NA	1,500	11 UJ	12 UJ	65	**14,000**	**17,000**	**4,000 J**	12 UJ	**15,000**	**27,000**	**14,000 J**	79	140	NA	16	15	NA	NA	14	140	NA	12
cPAHs (ug/kg)																									
Benzo(a)anthracene	See Note c	260	4.7 U	620	60 UJ	4.6 U	NA	32 J	NA	NA	NA	49 UJ	50 U	NA	NA	600	4.6 U	NA	57 J	4.7 U	NA	NA	120	15 UJ	NA
Chrysene	See Note c	300	4.7 U	930	60 UJ	4.6 U	NA	65 J	NA	NA	NA	150 J	50 U	NA	NA	700	4.6 U	NA	96 J	4.7 U	NA	NA	180	15 UJ	NA
Benzo(b)fluoranthene	See Note c	210	4.7 U	1,000	60 UJ	4.6 U	NA	36 J	NA	NA	NA	110 J	50 UJ	NA	NA	300	4.6 U	NA	46 J	4.7 U	NA	NA	150	15 UJ	NA
Benzo(k)fluoranthene	See Note c	250	4.7 U	990	60 UJ	4.6 U	NA	45 J	NA	NA	NA	110 J	50 UJ	NA	NA	300	4.6 U	NA	66 J	4.7 U	NA	NA	150	15 UJ	NA
Benzo(a)pyrene**	140[b]	**260**	4.7 U	**860**	60 UJ	4.6 U	NA	32 J	NA	NA	NA	74 J	50 UJ	NA	NA	**560**	4.6 U	NA	72 J	4.7 U	NA	NA	**150 J**	15 UJ	NA
Indeno(1,2,3-cd)pyrene	See Note c	120	4.7 U	680	60 UJ	4.6 U	NA	22 UJ	NA	NA	NA	49 UJ	50 UJ	NA	NA	200	4.6 U	NA	35	4.7 U	NA	NA	85	15 UJ	NA
Dibenzo(a,h)anthracene	See Note c	62	4.7 U	230	60 UJ	4.6 U	NA	22 UJ	NA	NA	NA	49 UJ	50 UJ	NA	NA	120	4.6 U	NA	15	4.7 U	NA	NA	32	15 UJ	NA
TTEC**	140[b]	**353**	NA	**1,221**	NA	NA	NA	44 J	NA	NA	NA	98 J	NA	NA	NA	**719**	NA	NA	95 J	NA	NA	NA	**206 J**	NA	NA
PCBs (ug/kg)																									
Aroclor 1016	5,600[b]	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	1,300 UJ	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	1,500	33 UJ	28 U	NA	31 U	NA	NA	NA	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	680 J	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	**2,180 J**	NA	NA	NA	NA	NA	NA	NA	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																									
Tributyltin as TBT Ion	7,400	NA	NA	7,200	3.7 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	140	NA	NA
Dibutyl Tin Ion	NE	NA	NA	4,100	5.5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	NA	NA
Butyl Tin Ion	NE	NA	NA	2,500	3.9 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	230	NA	NA
Metals (mg/kg)																									
Antimony**	32[b]	30 J	NA	**60 J**	6 U	NA	NA	5 U	NA	NA	NA	5 U	NA	NA	NA	5 U	NA	NA	5 U	NA	NA	NA	20	NA	NA
Arsenic**	20[a]	**160**	5 U	**470**	6	NA	NA	5 U	NA	NA	NA	6	NA	NA	NA	17	NA	NA	5	NA	NA	NA	**200**	6 U	NA
Cadmium	80[b]	0.5 UJ	NA	5.7 J	0.2 U	NA	NA	0.2 U	NA	NA	NA	0.2 U	NA	NA	NA	0.3	NA	NA	0.2 U	NA	NA	NA	1.7	NA	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	58	21.5	88	21.4	NA	NA	17.6	NA	NA	NA	19.3	NA	NA	NA	24.8	NA	NA	19.0	NA	NA	NA	65	33.4	NA
Copper**	3,200[b]	442	13.0	1,360	9.7	NA	NA	15.3	NA	NA	NA	25.4	NA	NA	NA	78.4	8.1	NA	38.3	8.9	NA	NA	1,200	19.5	NA
Lead**	250[a]	188 J	NA	**644 J**	5	NA	NA	13	NA	NA	NA	31	NA	NA	NA	71	NA	NA	28	NA	NA	NA	**294**	3	NA
Nickel	1,600[b]	34	NA	35	NA	NA	NA	22	NA	NA	NA	23	NA	NA	NA	26	NA	NA	23	NA	NA	NA	41	NA	NA
Zinc	24,000[b]	473	45	1,740	28	NA	NA	30	NA	NA	NA	48	NA	NA	NA	105	35	NA	45	NA	NA	NA	2,180	43	NA
VOCs (ug/kg)																									
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9 U	NA	NA	2.6 U	2.6 J	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	57 J	NA	NA	49	14 J	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.5	NA	NA	4.4	1.9 J	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 U	NA	NA	1.3 U	1.1 UJ	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.2 UJ	NA	NA	6.5 U	5.3 UJ	NA	NA	NA
SVOCs (ug/kg)																									
Pentachlorophenol	2,500[b]	NA	NA	950 U	NA	NA	NA	540 U	NA	NA	NA	2,100 U	1,300 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	810	NA	NA	NA	510 J	NA	NA	NA	5,900	900 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-11	SB-11	SB-11	SB-12	SB-12	SB-12	SB-13	SB-13	SB-14	SB-14	SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-17	SB-17	SB-18	SB-18	SB-18
Sample ID Depth Interval (feet bgs):		0 - 0.5	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	5 - 6	9 - 10	0 - 0.5	1 - 2	3 - 4
Date Collected:		12/11/2008	12/11/2008	12/11/2008	12/3/2008	12/3/2008	12/3/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/4/2008	12/4/2008	12/4/2008
Field QC:																						
TPH (mg/kg)																						
Diesel-range**	2,000[a]	32	NA	5.6 U	110	NA	NA	6.8	NA	6.0	NA	5.1 U	5.2 UJ	25	NA	43	NA	21	6.1 U	5.0 U	NA	6.2 U
Oil-range**	2,000[a]	200	NA	11 U	220	NA	NA	34	NA	25	NA	13	10 UJ	64	NA	190	NA	11 U	12 U	14	NA	12 U
cPAHs (ug/kg)																						
Benzo(a)anthracene	See Note c	46 J	NA	NA	340	6.9 J	NA	62	4.5 U	8.6	NA	61	4.7 U	20	NA	200	4.7 UJ	NA	NA	17	NA	4.6 U
Chrysene	See Note c	67 J	NA	NA	410	7.4 J	NA	90	4.5 U	14	NA	93	4.7 U	23	NA	440	4.7 UJ	NA	NA	23	NA	4.6 U
Benzo(b)fluoranthene	See Note c	59 J	NA	NA	310	7.4 J	NA	54	4.5 U	9.1	NA	57	4.7 U	13	NA	460	4.7 UJ	NA	NA	14	NA	4.6 U
Benzo(k)fluoranthene	See Note c	59 J	NA	NA	330	5.1 J	NA	78	4.5 U	14	NA	57	4.7 U	14	NA	300	4.7 UJ	NA	NA	14	NA	4.6 U
Benzo(a)pyrene**	140[b]	65 J	NA	NA	**360**	6.9 J	NA	100	4.5 U	12	NA	100	4.7 U	19	NA	**320**	4.7 UJ	NA	NA	19	NA	4.6 U
Indeno(1,2,3-cd)pyrene	See Note c	38	NA	NA	230	4.6 UJ	NA	51	4.5 U	8.2	NA	52	4.7 U	9.3	NA	130	4.7 UJ	NA	NA	10	NA	4.6 U
Dibenzo(a,h)anthracene	See Note c	18 J	NA	NA	81	4.6 UJ	NA	26	4.5 U	4.8 U	NA	23	4.7 U	4.9 U	NA	51	4.7 UJ	NA	NA	4.8	NA	4.6 U
TTEC**	140[b]	88 J	NA	NA	**493**	8.9 J	NA	128	NA	16	NA	126	NA	25	NA	**439**	NA	NA	NA	25	NA	NA
PCBs (ug/kg)																						
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																						
Tributyltin as TBT Ion	7,400	NA	NA	NA	390 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9 J	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	640 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.0 J	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	340 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6 J	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																						
Antimony**	32[b]	20	NA	NA	**100**	5 UJ	NA	5 UJ	NA	5 UJ	NA	5 UJ	5 UJ	5 U	NA	5 U	NA	NA	NA	5 UJ	NA	6 UJ
Arsenic**	20[a]	**110**	5 U	NA	**350**	11	NA	10	NA	6	NA	5 U	5 U	7	NA	12	NA	NA	NA	5 UJ	NA	6 UJ
Cadmium	80[b]	0.8	NA	NA	2.2	0.2 U	NA	0.2 UJ	NA	0.2 UJ	NA	0.2 UJ	0.2 U	0.2	NA	0.5	NA	NA	NA	0.2 U	NA	0.3
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	58	19.1	NA	49	19.8	NA	23.1	NA	22.3	NA	21.7	19.4 J	24.6	NA	29.2	NA	NA	NA	22.7	NA	30.1
Copper**	3,200[b]	334	7.4	NA	816	21.8 J	NA	22.6	NA	33.5	NA	10.7	7.1	50.8	9.0 J	71.2	8.0 J	NA	NA	57.5	7.5	19.6
Lead**	250[a]	167	NA	NA	**355**	8 J	NA	11 J	NA	31 J	NA	5 J	2 U	24	NA	69	NA	NA	NA	21 J	NA	4 J
Nickel	1,600[b]	40	NA	NA	37	NA	NA	27	NA	27	NA	26	18 J	22	NA	29	NA	NA	NA	23	NA	41
Zinc	24,000[b]	924	23	NA	1,100	36	NA	48	NA	79	NA	28	21 J	68	NA	187	23	NA	NA	53	NA	39
VOCs (ug/kg)																						
Methylene chloride	130,000[b]	NA	NA	2.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7	NA	NA	NA	NA
Benzene	30[a]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.9	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	61	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 U	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.7	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14	NA	NA	NA	NA
SVOCs (ug/kg)																						
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
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[b] MTCA Method B Soil Cleanup Level - Direct contact
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[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-19	SB-19	SB-19	SB-19	SB-20	SB-21	SB-21	SB-22	SB-22	SB-23	SB-23	SB-24	SB-24	SB-24	SB-25	SB-25	SB-25	SB-26	SB-26	SB-26	SB-27
Sample ID Depth Interval (feet bgs):		0 - 0.5	1 - 2	3 - 4	4 - 5	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	1 - 2	1 - 2	2 - 3	1 - 2	2 - 3	3 - 4	1 - 2	2 - 3	3 - 4	0 - 0.5	1 - 2	2 - 3	0 - 0.5
Date Collected:		12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/1/2008	12/1/2008	1/6/2009	1/6/2009	1/6/2009	1/21/2009	1/21/2009	1/21/2009	12/11/2008	12/11/2008	12/11/2008	12/4/2008
Field QC:																						
TPH (mg/kg)																						
Diesel-range**	2,000[a]	7.0	NA	10	6.5 U	5.0 U	5.6 U	NA	5.8 U	NA	NA	NA	570	99	140	NA	NA	10	**3,500**	6.9 UJ	NA	5.5 U
Oil-range**	2,000[a]	26	NA	19	13 U	10 U	14	NA	12 U	NA	NA	NA	**2,500**	240	110	NA	NA	13 U	**2,100**	14 UJ	NA	14
cPAHs (ug/kg)																						
Benzo(a)anthracene	See Note c	15	NA	4.8 U	NA	6.1	11	NA	4.8 U	NA	68 U	60 U	2,000 J	63 U	NA	65 U	65 U	NA	4,400	4.6 UJ	NA	4.6 U
Chrysene	See Note c	19	NA	4.8 U	NA	7.5	15	NA	4.8 U	NA	290	60 U	2,700 J	63 U	NA	65 U	65 U	NA	6,400	4.6 UJ	NA	4.6 U
Benzo(b)fluoranthene	See Note c	11	NA	4.8 U	NA	4.4	8.4	NA	4.8 U	NA	100	60 U	3,000 J	63 U	NA	65 U	65 U	NA	3,800	4.6 UJ	NA	4.6 U
Benzo(k)fluoranthene	See Note c	11	NA	4.8 U	NA	4.4	7.0	NA	4.8 U	NA	110	60 U	2,500 J	63 U	NA	65 U	65 U	NA	3,800 J	4.6 UJ	NA	4.6 U
Benzo(a)pyrene**	140[b]	16	NA	4.8 U	NA	6.6	7.9	NA	4.8 U	NA	68 U	60 U	**3,000 J**	63 U	NA	65 U	65 U	NA	**2,200 J**	4.6 UJ	NA	4.6 U
Indeno(1,2,3-cd)pyrene	See Note c	7.8	NA	4.8 U	NA	4.4 U	5.1	NA	4.8 U	NA	68 U	60 U	810 J	63 U	NA	65 U	65 U	NA	1,600	4.6 UJ	NA	4.6 U
Dibenzo(a,h)anthracene	See Note c	4.9 U	NA	4.8 U	NA	4.4 U	4.7 U	NA	4.8 U	NA	68 U	60 U	320 J	63 U	NA	65 U	65 U	NA	680	4.6 UJ	NA	4.6 U
TTEC**	140[b]	21	NA	NA	NA	8.2	11	NA	NA	NA	24	NA	**3,890 J**	NA	NA	NA	NA	NA	**3,692 J**	NA	NA	NA
PCBs (ug/kg)																						
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	1,100 UJ	31 UJ	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	32 U	**9,200 J**	1,200	180	**5,800**	32 U	NA	**2,500 J**	31 UJ	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	45	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	930 J	31 UJ	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	125	NA	**9,200 J**	**1,200**	180	**5,800**	NA	NA	**3,430 J**	NA	NA	NA
Organotins (ug/kg)																						
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	3.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,500	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	5.4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,800	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	3.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,200	NA	NA	NA
Metals (mg/kg)																						
Antimony**	32[b]	5 UJ	NA	7 UJ	NA	5 UJ	6 UJ	NA	6 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	**70**	6 U	7 U	6 UJ
Arsenic**	20[a]	6 J	NA	7 UJ	NA	5 UJ	6 U	NA	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	**320**	6 U	7 U	6 J
Cadmium	80[b]	0.2	NA	0.3	NA	0.2 U	0.2 U	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8	0.3	0.3 U	0.2 U
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	23.7	NA	34.5	NA	21.4	24.5	NA	27.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	152	29.4	30.8	27.7
Copper**	3,200[b]	424	8.5	45.0	14.5	12.5	23.6	NA	18.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4,560**	19.8	21.4	17.5
Lead**	250[a]	**373 J**	2	23 J	NA	3 J	8	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	**775**	3	4	5 J
Nickel	1,600[b]	21	NA	35	NA	20	21	NA	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	NA	NA	23
Zinc	24,000[b]	54	NA	45	NA	28	44	NA	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,720	42	39	36
VOCs (ug/kg)																						
Methylene chloride	130,000[b]	NA	NA	NA	3.1 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	38	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	10 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	5.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																						
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	340 U	300 U	570 UJ	310 U	NA	320 U	330 U	NA	930 J	320 UJ	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	980	60 U	3,100 J	63 U	NA	65 U	65 U	NA	5,600 J	63 UJ	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-28	SB-28	SB-28	SB-28	SB-29	SB-29	SB-29	SB-29	SB-30	SB-30	SB-30	SB-30	SB-31	SB-31	SB-32	SB-32	SB-33	SB-33	SB-34	SB-35	SB-35	SB-35
Sample ID Depth Interval (feet bgs):		0 - 0.5	0 - 0.5	1 - 2	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	1 - 2	2 - 3	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5	0 - 0.5	1 - 2
Date Collected:		12/4/2008	12/4/2008	12/1/2008	12/4/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/2/2008	12/2/2008	12/11/2008	12/2/2008	12/2/2008	12/2/2008
Field QC:			Field Duplicate									Field Duplicate										Field Duplicate	
TPH (mg/kg)																							
Diesel-range**	2,000[a]	29	33	NA	NA	20	NA	9.2	NA	120	NA	NA	6.0 U	14	NA	320	NA	5.6 U	5.4 U	19	71	62	140
Oil-range**	2,000[a]	140	150	NA	NA	60	NA	16	NA	310	NA	NA	12 U	38	NA	1,600	NA	11 U	11 U	54	68	53	360
cPAHs (ug/kg)																							
Benzo(a)anthracene	See Note c	21	30	NA	NA	110	4.7 UJ	4.8 U	NA	2,200	6.4 J	NA	4.8 U	330	26	210	4.7 U	4.6 U	NA	53	52	56	8.5
Chrysene	See Note c	50	64	NA	NA	120	4.7 UJ	4.8 U	NA	2,300	7.4 J	NA	4.8 U	420	44	300	4.7 U	4.6 U	NA	61	51	58	7.6
Benzo(b)fluoranthene	See Note c	31	42	NA	NA	110	4.7 UJ	4.8 U	NA	2,200	6.4 J	NA	4.8 U	200	23	250	4.7 U	4.6 U	NA	26	18	21	4.7 U
Benzo(k)fluoranthene	See Note c	31	42	NA	NA	110	4.7 UJ	4.8 U	NA	2,000	5.9 J	NA	4.8 U	200	27	260	4.7 U	4.6 U	NA	19	18	19	4.7 U
Benzo(a)pyrene**	140[b]	29	32	NA	NA	110	4.7 UJ	4.8 U	NA	**1,800**	6.4 J	NA	4.8 U	**360**	30	**300**	4.7 U	4.6 U	NA	17 J	16	21	4.7 U
Indeno(1,2,3-cd)pyrene	See Note c	19 U	28	NA	NA	52	4.7 UJ	4.8 U	NA	660	4.9 UJ	NA	4.8 U	170	17	150	4.7 U	4.6 U	NA	5.1	6.3	7.9	4.7 U
Dibenzo(a,h)anthracene	See Note c	19 U	21 U	NA	NA	19	4.7 UJ	4.8 U	NA	230	4.9 UJ	NA	4.8 U	88	8.2	60	4.7 U	4.6 U	NA	4.7 U	4.5 U	4.7	4.7 U
TTEC**	140[b]	38	47	NA	NA	**151**	NA	NA	NA	**2,552**	8.3 J	NA	NA	**463**	41	**396**	NA	NA	NA	28 J	26	32	0.9
PCBs (ug/kg)																							
Aroclor 1016	5,600[b]	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1242	NE	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1248	NE	NA	NA	NA	NA	31 U	NA	NA	NA	220	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	36	NA	NA	NA	760	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1260	NE	NA	NA	NA	NA	31 U	NA	NA	NA	500	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1221	NE	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1232	NE	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA	NA	NA	33 U
Total PCBs**	1,000[a]	NA	NA	NA	NA	36	NA	NA	NA	**1,480**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																							
Tributyltin as TBT Ion	7,400	3.2 U	3.1 U	3.4 U	NA	270	NA	NA	NA	2,700	NA	NA	NA	NA	NA	NA	NA	3.6 U	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	4.8 U	4.6 U	5.0 U	NA	75	NA	NA	NA	1,600	NA	NA	NA	NA	NA	NA	NA	5.4 U	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	6.2	5.6	3.5 U	NA	52	NA	NA	NA	1,100	NA	NA	NA	NA	NA	NA	NA	3.8 U	NA	NA	NA	NA	NA
Metals (mg/kg)																							
Antimony**	32[b]	5 UJ	5 UJ	5 U	NA	5 U	NA	6 U	NA	**80**	6 UJ	6 UJ	6 U	5 UJ	NA	5 UJ	NA	5 UJ	NA	5 U	6 UJ	6 UJ	NA
Arsenic**	20[a]	6 J	6 J	5 U	NA	**33**	6	6 U	NA	**390**	17	8	6 U	12	NA	5 U	NA	5 U	NA	7	6 U	6 U	NA
Cadmium	80[b]	0.5	0.6	0.2 U	NA	0.3	NA	0.2 U	NA	2.6	0.3	0.2 U	0.3 U	0.2 UJ	NA	0.2 UJ	NA	0.2 U	NA	0.2 U	0.2 U	0.2 U	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	26.5	28.2	20.3	NA	25.9	NA	28.5	NA	66	27.6	26.4	27.0	27.7	NA	21.8	NA	22.6	NA	27.0	27.9	29.5	NA
Copper**	3,200[b]	99.4	165	8.6	NA	79.6	13.3 J	15.7	NA	1,420	39.4 J	22.9 J	17.1	35.7	11.3	23.0	NA	19.0	NA	32.6	42.1	33.1	16.4 J
Lead**	250[a]	82 J	138 J	3	NA	31	NA	3	NA	**552**	13 J	6 J	4	27 J	NA	53 J	NA	13	NA	16	7	7	NA
Nickel	1,600[b]	27	32	23	NA	21	NA	109	30	30	NA	NA	38	30	NA	27	NA	21	NA	27	33	34	NA
Zinc	24,000[b]	102	117	30	NA	129	28	38	NA	1,520	50	39	44	77	NA	47	NA	38	NA	60	40	43	NA
VOCs (ug/kg)																							
Methylene chloride	130,000[b]	NA	NA	NA	4.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.2	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	6.2 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.5 U	NA	NA	NA	NA
SVOCs (ug/kg)																							
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	300 U	NA	NA	NA	440	300 U	NA	NA	NA	NA	910 U	NA	NA	NA	NA	NA	NA	310 U
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	60 U	NA	NA	NA	2,700	60 U	NA	NA	NA	NA	180 U	NA	NA	NA	NA	NA	NA	62 U

Notes:
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NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
$\boxed{\textbf{BOLD}}$ Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-36	SB-36	SB-36	SB-37	SB-38	SB-39		SB-40		SB-40	SB-41	SB-42	SB-42	SB-42	SB-43	SB-43	SB-44	SB-45	SB-46	SB-47	SB-48		SB-48
Sample ID Depth Interval (feet bgs):		0 - 0.5	1 - 2	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5		0 - 0.5		1 - 2	0 - 0.5	0 - 0.5	1 - 2	2 - 3	1 - 2	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5		2 - 3
Date Collected:		12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008		12/10/2008		12/10/2008	12/10/2008	12/1/2008	12/1/2008	12/1/2008	10/28/2009	10/28/2009	10/27/2009	10/27/2009	10/27/2009	10/27/2009	11/25/2009		11/25/2009
Field QC:								Field Duplicate		Field Duplicate													Field Duplicate	
TPH (mg/kg)																								
Diesel-range**	2,000[a]	210	140	NA	5.6 U	5.3 U	5.3 U	5.2 U	5.0 U	5.2 U	NA	6.7 U	350 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil-range**	2,000[a]	520	330	NA	11 U	13	13	12	10 U	12	NA	13 U	420 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAHs (ug/kg)																								
Benzo(a)anthracene	See Note c	290	440	110	4.6 U	4.8 U	4.8 U	4.7 U	52	39	4.8 U	4.7 U	5,000	550	4.6 UJ	32	NA	4.6 U	4.9 U	5.0 U	5.0 U	180	220	5.0 U
Chrysene	See Note c	400	490	110	4.6	4.8 U	4.8 U	4.7 U	67	51	4.8 U	4.7 U	6,900	800	4.6 UJ	44	NA	4.6 U	4.9 U	5.0 U	5.0 U	250	330	5.0 U
Benzo(b)fluoranthene	See Note c	190	170	57	4.6 U	4.8 U	4.8 U	4.7 U	37	33	4.8 U	4.7 U	2,300	360	4.6 UJ	22	NA	4.6 U	4.9 U	5.0 U	5.0 U	230	290	5.0 U
Benzo(k)fluoranthene	See Note c	200	110	34	4.6 U	4.8 U	4.8 U	4.7 U	54	39	4.8 U	4.7 U	2,700	360	4.6 UJ	31	NA	4.6 U	4.9 U	5.0 U	5.0 U	230	290	5.0 U
Benzo(a)pyrene**	140[b]	140	**190**	40	4.6 U	4.8 U	4.8 U	4.7 U	74	60	4.8 U	4.7 U	**3,400**	**610**	4.6 UJ	24	NA	4.6 U	4.9 U	5.0 U	5.0 U	**280**	**320**	5.0 U
Indeno(1,2,3-cd)pyrene	See Note c	75	25	24	4.6 U	4.8 U	4.8 U	4.7 U	38	33	4.8 U	4.7 U	1,400	310	4.6 UJ	18	NA	4.6 U	4.9 U	5.0 U	5.0 U	130	170	5.0 U
Dibenzo(a,h)anthracene	See Note c	34	17	8.4	4.6 U	4.8 U	4.8 U	4.7 U	17	14	4.8 U	4.7 U	830	170	4.6 UJ	8.2	NA	4.6 U	4.9 U	5.0 U	5.0 U	59	74	5.0 U
TTEC**	140[b]	**223**	**267**	64	0.05	NA	NA	NA	94	76	NA	NA	**4,692**	**793**	NA	36	NA	NA	NA	NA	NA	**365**	**428**	NA
PCBs (ug/kg)																								
Aroclor 1016	5,600[b]	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	64 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																								
Tributyltin as TBT Ion	7,400	420	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																								
Antimony**	32[b]	6 UJ	NA	NA	6 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U	NA	6 U	5 UJ	NA	NA	9 J	NA	5 UJ	5 UJ	5 UJ	5 UJ	6 UJ	8 J	NA
Arsenic**	20[a]	12	NA	NA	6 U	5 U	5 U	5 U	5 U	5 U	NA	6 U	5 U	NA	NA	**38 J**	**46 J**	5 U	6	5	6	**40**	**60**	5
Cadmium	80[b]	0.4	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3 U	0.2 UJ	NA	NA	0.4	NA	0.2 U	0.2 U	0.2 U	0.2 U	1.4	1.8	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	35.7	NA	NA	27.5	26.0	36.8	37.8	18.5	21.6	NA	20.2	28.7	NA	NA	23.4	NA	23.3	22.1	20.3	20	31	38.9	NA
Copper**	3,200[b]	95.5	29.3 J	NA	16.0	12.6	18.0	18.0	8.0	8.6	NA	6.9	32.4	NA	NA	121	82.9 J	9.7	8.5	6.8	6.8	413	489	9.5
Lead**	250[a]	24	NA	NA	4	4	4	4	4	5	NA	3 U	14 J	NA	NA	67 J	NA	2 U	2 U	2 U	2 U	112	145	NA
Nickel	1,600[b]	39	NA	NA	23	24	44	47	21	20	NA	22	32	NA	NA	25	NA	22	21	20	22	30	34	NA
Zinc	24,000[b]	117	57	NA	34	31	37	39	22	25	NA	23	66	NA	NA	311 J	188	28	26	23	25	616	906	28
VOCs (ug/kg)																								
Methylene chloride	130,000[b]	NA	3.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	6.9 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	1.0 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																								
Pentachlorophenol	2,500[b]	NA	320 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	850 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	64 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	170 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-49	SB-49	SB-50	SB-51	SB-52	SB-53	SB-53	SB-54	SB-54	SB-55		SB-55	SB-56	SB-57	SB-58	SB-59		SB-60	SB-60	SB-61	SB-61
Sample ID Depth Interval (feet bgs):		0 - 0.5	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5		2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5		0 - 0.5	2 - 3	0 - 0.5	2 - 3
Date Collected:		11/25/2009	11/25/2009	11/25/2009	11/25/2009	11/25/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009		10/30/2009	10/27/2009	10/27/2009	10/29/2009	10/29/2009		10/30/2009	10/30/2009	10/30/2009	10/30/2009
Field QC:												Field Duplicate						Field Duplicate				
TPH (mg/kg)																						
Diesel-range**	2,000[a]	NA	NA	NA	NA	NA	5.9 U	NA	6.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.8	NA	7.9	NA
Oil-range**	2,000[a]	NA	NA	NA	NA	NA	12 U	NA	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	21	NA	25	NA
cPAHs (ug/kg)																						
Benzo(a)anthracene	See Note c	63	NA	18	4.6 U	8.7	8.4	NA	130	15	62	73	NA	4.7 U	38	6.8	4.5 U	4.6 U	24	NA	700	4.8 U
Chrysene	See Note c	71	NA	25	6.9 J	14	14	NA	160	18	120	140	NA	4.7 U	47	12	4.5 U	4.6 U	35	NA	870	4.8 U
Benzo(b)fluoranthene	See Note c	56	NA	20	4.6 J	8.7	7.9	NA	160	20	44	54	NA	4.7 U	26	6.8	4.5 U	4.6 U	22	NA	380	4.8 U
Benzo(k)fluoranthene	See Note c	56	NA	20	4.6	8.7	7.9	NA	110	20	44	54	NA	4.7 U	22	6.8	4.5 U	4.6 U	19	NA	360	4.8 U
Benzo(a)pyrene**	140[b]	65	NA	29	4.6 J	12	11	NA	140	20	41	50	NA	4.7 U	39	9.6	4.5 U	4.6 U	23	NA	**570**	4.8 U
Indeno(1,2,3-cd)pyrene	See Note c	30	NA	14	5.1 J	4.6 U	7.4	NA	86	20	35	52	NA	4.7 U	17	7.3	4.5 U	4.6 U	15	NA	220	4.8 U
Dibenzo(a,h)anthracene	See Note c	18	NA	4.7 U	4.6 U	4.6 U	5 U	NA	40	4.6	15	22	NA	4.7 U	5.1	4.6 U	4.5 U	4.6 U	5.8	NA	110	4.8 U
TTEC**	140[b]	88	NA	36	6.1	15	14	NA	**194**	28	62	77	NA	NA	50	12	NA	NA	32	NA	**756**	NA
PCBs (ug/kg)																						
Aroclor 1016	5,600[b]	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Aroclor 1242	NE	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Aroclor 1248	NE	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	42 J	NA	540 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Aroclor 1254**	1,600[b]	39 J	NA	NA	31 UJ	32 UJ	NA	NA	34 J	NA	1,500 J	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	34 J	NA
Aroclor 1260	NE	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	160 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Aroclor 1221	NE	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Aroclor 1232	NE	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA
Total PCBs**	1,000[a]	39 J	NA	NA	NA	NA	NA	NA	76 J	NA	**1,500 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	34 J	NA
Organotins (ug/kg)																						
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																						
Antimony**	32[b]	5 UJ	NA	6 UJ	5 UJ	5 UJ	6 UJ	NA	6 UJ	NA	5 UJ	5 UJ	NA	5 UJ	5 UJ	5 UJ	5 UJ	6 UJ	6 UJ	NA	6 UJ	NA
Arsenic**	20[a]	**30**	6	8	5 U	5 U	8	NA	8	NA	**30**	**24**	4.2	5 U	10	5 U	6	6	8	NA	7	NA
Cadmium	80[b]	0.6	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3	NA	0.9	0.8	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2	NA	0.2 U	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	33.8	NA	25.4	28	24.6	24.2	NA	25.8	NA	40.2	37.4	NA	24.7	24.4	14.5	23.3	22.4	27.1	NA	23.6	NA
Copper**	3,200[b]	104	8.3	26.7	23.5	19.3	40.6 J	14.8	62.4 J	12	426 J	459 J	8.9	11.3	13.7	24	8.7	10.1	42.8 J	23.1	53 J	11.7
Lead**	250[a]	82	NA	14	8	7	14	NA	24	NA	**350**	**351**	2	2 U	4	95	2 U	2	18	NA	10	NA
Nickel	1,600[b]	34	NA	28	29	30	20	NA	25	NA	21	20	NA	21	23	17	24	24	23	NA	20	NA
Zinc	24,000[b]	210	24	75	46	40	139 J	40	238 J	27	277 J	257 J	27	31	31	59	30	30	93 J	NA	96 J	NA
VOCs (ug/kg)																						
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																						
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Level	SB-62	SB-62	SB-62	SB-62	SB-62	SB-63	SB-63	SB-64	SB-64	SB-64	SB-65	SB-65	SB-65	SB-66	SB-66	SB-66	SB-67	SB-67	SB-67	SB-68	SB-68
Sample ID Depth Interval (feet bgs):		SS	0 - 0.5	0 - 0.5	2 - 3	2 - 3	SS	0 - 0.5	SS	0 - 0.5	2 - 3	SS	0 - 0.5	2 - 3	SS	0 - 0.5	2 - 3	SS	0 - 0.5	2 - 3	SS	0 - 0.5
Date Collected:		10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/28/2009	10/28/2009
Field QC:				Field Duplicate		Field Duplicate																
TPH (mg/kg)																						
Diesel-range**	2,000[a]	NA	5.4 U	5.4 U	43 J	18 J	NA	5.7 U	NA	5.4 U	NA	NA	5.4 U	NA	5.5 U	5.5 U	NA	NA	72	NA	NA	21
Oil-range**	2,000[a]	NA	11 U	11 U	560 J	220 J	NA	11 U	NA	21	NA	NA	12	NA	17	17	NA	NA	72	NA	NA	70
cPAHs (ug/kg)																						
Benzo(a)anthracene	See Note c	110 J	4.8 U	4.8 U	18	17	210 J	29	51 J	75	4.8 U	4.8 U	93	4.8 U	12 J	42	NA	13 J	49	NA	740 J	13
Chrysene	See Note c	160 J	5.3	6.3	44	32	250 J	40	95 J	130	4.8 U	4.8 U	160	5.3	21 J	67	NA	28 J	84	NA	880 J	22
Benzo(b)fluoranthene	See Note c	100 J	4.8 U	5.3	20 J	17 J	310 J	20	42 J	74	4.8 U	4.8 U	76	4.8 U	10 J	35	NA	16 J	44	NA	650 J	11
Benzo(k)fluoranthene	See Note c	120 J	4.8 U	5.3	20 J	17 J	280 J	20	42 J	58	4.8 U	4.8 U	72	4.8 U	10 J	35	NA	16 J	44	NA	650 J	11
Benzo(a)pyrene**	140[b]	110 J	4.8 U	5.3	27 J	20 J	**360 J**	34	58 J	85	4.8 U	4.8 U	110	4.8 U	15 J	51	NA	20 J	44	NA	**860 J**	17
Indeno(1,2,3-cd)pyrene	See Note c	74 J	4.8 U	4.8 U	16	15	220 J	18	31 J	46	4.8 U	4.8 U	52	4.8 U	8.1 J	28	NA	14 J	30	NA	480 J	11
Dibenzo(a,h)anthracene	See Note c	31 J	4.8 U	4.8 U	15 U	14 U	72 J	5.2	14 J	21	4.8 U	4.8 U	26	4.8 U	4.8 UJ	14	NA	7.2 UJ	12	NA	240 J	4.8 U
TTEC**	140[b]	**155**	0.05	6.4	35	27	**472**	44	77	114	NA	NA	**144**	0.05	19	67	NA	26	63	NA	**1,145**	22
PCBs (ug/kg)																						
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	47 J	42 J	NA	270 UJ	33 UJ
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	61 J	67 J	NA	800 J	71 J
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64 J	48 UJ	NA	210 UJ	49 UJ
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	172 J	109 J	NA	800 J	71 J
Organotins (ug/kg)																						
Tributyltin as TBT Ion	7,400		NA	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE		NA	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE		NA	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																						
Antimony**	32[b]	NA	5 UJ	5 UJ	6 UJ	6 UJ	NA	5 UJ	NA	5 UJ	NA	NA	5 UJ	NA	NA	5 UJ	NA	NA	5 UJ	NA	NA	5 UJ
Arsenic**	20[a]	NA	6	6	11	11	NA	7	NA	8	NA	NA	7	NA	NA	7	NA	NA	10	NA	NA	7 J
Cadmium	80[b]	NA	0.2 U	0.2 U	0.3	0.4	NA	0.2 U	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2	NA	NA	0.4	NA	NA	0.2 U
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	29.4	48.5	32.8	40.6	NA	24.6	NA	22.4	NA	NA	22.5	NA	NA	27.6	NA	NA	40	NA	NA	32.8
Copper**	3,200[b]	NA	29.9 J	29.8 J	90.8 J	100 J	NA	13.8 J	NA	26	NA	NA	24	NA	NA	72.1	8.6	NA	302	12.4	NA	22.7
Lead**	250[a]	NA	7	6	142	100	NA	12	NA	43	NA	NA	20	NA	NA	89	NA	NA	**382**	NA	NA	15 J
Nickel	1,600[b]	NA	44	41	29	30	NA	24	NA	22	NA	NA	25	NA	NA	26	NA	NA	25	NA	NA	34
Zinc	24,000[b]	NA	45 J	51 J	116 J	115 J	NA	36 J	NA	59	NA	NA	44	NA	NA	104	26	NA	329	29	NA	47 J
VOCs (ug/kg)																						
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																						
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID: Sample ID Depth Interval (feet bgs): Date Collected: Field QC:	Preliminary Cleanup Level	SB-69 SS 10/28/2009	SB-69 0 - 0.5 10/28/2009	SB-69 2 - 3 10/28/2009	SB-70 SS 10/28/2009	SB-70 0 - 0.5 10/28/2009	SB-71 SS 10/28/2009	SB-71 2 - 3 10/28/2009	SB-72 0 - 0.5 10/27/2009	SB-72 2 - 3 10/27/2009
TPH (mg/kg)										
Diesel-range**	2,000[a]	5.1 U	19	NA	NA	16	5.3 U	5.2 U	6.5	NA
Oil-range**	2,000[a]	10 U	81	NA	NA	160	12	10 U	14	NA
cPAHs (ug/kg)										
Benzo(a)anthracene	See Note c	4.7 U	150	4.8	54 J	18	8.1	NA	270	4.8 U
Chrysene	See Note c	4.7 U	270	5.3	85 J	30	13	NA	410	4.8 U
Benzo(b)fluoranthene	See Note c	4.7 U	110	4.8 U	44 J	11	5.7	NA	220	4.8 U
Benzo(k)fluoranthene	See Note c	4.7 U	140	4.8 U	44 J	11	5.7	NA	200	4.8 U
Benzo(a)pyrene**	140[b]	4.7 U	**180**	4.8 U	69 J	20	9.5	NA	**320**	4.8 U
Indeno(1,2,3-cd)pyrene	See Note c	4.7 U	85	4.8 U	34 J	10	6.2	NA	150	4.8 U
Dibenzo(a,h)anthracene	See Note c	4.7 U	38	4.8 U	11 J	7.1	4.8 U	NA	73	4.8 U
TTEC**	140[b]	NA	**235**	0.5	89	26	12	NA	**415**	NA
PCBs (ug/kg)										
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)										
Tributyltin as TBT Ion	7,400	NA	NA	NA		NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA		NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA		NA	NA	NA	NA	NA
Metals (mg/kg)										
Antimony**	32[b]	NA	5 UJ	NA	NA	5 UJ	5 UJ	NA	10 J	NA
Arsenic**	20[a]	NA	8 J	NA	NA	5 UJ	8 J	NA	7	NA
Cadmium	80[b]	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA	1	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	23.4	NA	NA	15.3	22.6	NA	26.5	NA
Copper**	3,200[b]	NA	141	10.2 J	NA	11.1	8.9	NA	191	13.9
Lead**	250[a]	NA	59 J	NA	NA	11 J	5 J	NA	**4,630**	2 U
Nickel	1,600[b]	NA	27	NA	NA	18	26	NA	24	NA
Zinc	24,000[b]	NA	87 J	NA	NA	34 J	28 J	NA	312	30
VOCs (ug/kg)										
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)										
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
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[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Levels	SB-73	SB-73	SB-73	SB-74	SB-74	SB-75	SB-75	SB-76	SB-76	SB-77	SB-77	SB-78	SB-78	SB-79		SB-79
Sample ID Depth Interval (feet bgs):		SS	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5		2 - 3
Date Collected:		10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009		10/28/2009
Field QC:																Field Duplicate	
TPH (mg/kg)																	
Diesel-range**	2,000[a]	NA	410	5.8 U	1,100	**2,100**	240	NA	70	NA	44	NA	74	NA	86	92	NA
Oil-range**	2,000[a]	NA	**4,500**	12 U	**11,000**	**25,000**	540	NA	270	NA	75	NA	330	NA	260	270	NA
PAHs (ug/kg)																	
Benzo(a)anthracene	See Note c	62 J	26 U	NA	50 U	NA	410	5.7	160	7.1	82	37	350	98	630 J	290 J	4.8 U
Chrysene	See Note c	120 J	26 U	NA	50 U	NA	780	8.1	210	9	120	56	440	110	830 J	390 J	4.8 U
Benzo(b)fluoranthene	See Note c	51 J	26 U	NA	50 U	NA	1400	5.2	150	5.7	50	28	300	63	340 J	230 J	4.8 U
Benzo(k)fluoranthene	See Note c	51 J	26 U	NA	50 U	NA	1000	5.2	140	5.7	66	28	310	63	380 J	210 J	4.8 U
Benzo(a)pyrene**	140[b]	66 J	26 U	NA	50 U	NA	**1,000**	7.1	**170**	9	82	42	**350**	100	**630 J**	**300 J**	4.8 U
Indeno(1,2,3-cd)pyrene	See Note c	36 UJ	26 U	NA	50 U	NA	1000	4.8 U	120	5.7	47	20	230	47	280 J	170 J	4.8 U
Dibenzo(a,h)anthracene	See Note c	36 UJ	26 U	NA	50 U	NA	290	4.8 U	48	4.8 U	23	8.1	100	20	150 J	88 J	4.8 U
TTEC**	140[b]	84	NA	NA	NA	NA	**1,418**	8.8	**234**	12	110	55	**483**	130	**816**	**403**	NA
PCBs (ug/kg)																	
Aroclor 1016	5,600[b]	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ
Aroclor 1242	NE	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ
Aroclor 1248	NE	38 J	40 UJ	NA	150 J	31 UJ	530 UJ	31 UJ	490 J	31 UJ	34,000 J	180 J	6,800 J	300 UJ	10,000 J	8,200 J	32 UJ
Aroclor 1254**	1,600[b]	68 J	49 J	NA	110 J	31 UJ	**1,900 J**	31 UJ	670 J	31 UJ	**17,000 J**	73 J	**7,700 J**	520 J	**9,500 J**	**7,700 J**	32 UJ
Aroclor 1260	NE	66 J	50 J	NA	66 J	31 UJ	1,700 J	31 UJ	400 J	31 UJ	6,500 J	31 UJ	2,600 J	300 UJ	3,800 J	3,200 J	32 UJ
Aroclor 1221	NE	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ
Aroclor 1232	NE	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ
Total PCBs**	1,000[a]	172 J	99 J	NA	326 J	NA	**3,600 J**	NA	**1,560 J**	NA	**57,500 J**	253 J	**17,100 J**	520 J	**23,300 J**	**19,100 J**	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	32[b]	NA	5 UJ	NA	5 UJ	NA	**70 J**	6 UJ	20 J	NA	12 J	NA	20 J	NA	6 J	11 J	NA
Arsenic**	20[a]	NA	6 J	NA	6 J	NA	**450 J**	7	**170 J**	8	**79 J**	7	**200 J**	10	**49 J**	**86 J**	6
Cadmium	80[b]	NA	0.2 U	NA	0.2 U	NA	3	NA	1	NA	0.3	NA	1.1	NA	0.5	0.7	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	18.4	NA	16.9	NA	77	NA	38	NA	29.7	NA	63	NA	48.9	46.3	NA
Copper**	3,200[b]	NA	6.7	NA	9.5	NA	1,730	11.7 J	446	17.3 J	144	14.6 J	905	46.2 J	331	358	9.1 J
Lead**	250[a]	NA	2 UJ	NA	4 J	NA	**690 J**	2 U	248 J	3	97 J	NA	**2,220 J**	13	157 J	188 J	NA
Nickel	1,600[b]	NA	25	NA	21	NA	36	NA	28	NA	25	NA	39	NA	31	34	NA
Zinc	24,000[b]	NA	22 J	NA	23 J	NA	7,230 J	32	998 J	43	267 J	40	1,040 J	81	369 J	535 J	38
VOCs (ug/kg)																	
Methylene chloride	130,000[b]	NA	NA	NA	1.6 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	94 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	2.9 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	36 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	4.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																	
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID: Sample ID Depth Interval (feet bgs): Date Collected: Field QC:	**Preliminary Cleanup Levels**	SB-80 0 - 0.5 10/26/2009	SB-80 2 - 3 10/26/2009	SB-81 0 - 0.5 10/26/2009	SB-81 1 - 2 10/26/2009	SB-81 2 - 3 10/26/2009	SB-82 0 - 0.5 10/26/2009	SB-83 0 - 0.5 10/26/2009	SB-84 0 - 0.5 10/26/2009	SB-84 2 - 3 10/26/2009	SB-85 0 - 0.5 10/26/2009	SB-85 2 - 3 10/26/2009	SB-86 0 - 0.5 10/26/2009	SB-87 0 - 0.5 10/27/2009	SB-88 SS 10/29/2009	SB-88 0 - 0.5 10/29/2009	SB-88 2 - 3 10/29/2009
TPH (mg/kg)																	
Diesel-range**	2,000[a]	NA	NA	NA	27 J	NA	NA	NA	5.4 U	NA	5.4 U	NA	5.3 U	NA	NA	NA	NA
Oil-range**	2,000[a]	NA	NA	NA	76	NA	NA	NA	11 U	NA	24	NA	11 U	NA	NA	NA	NA
PAHs (ug/kg)																	
Benzo(a)anthracene	See Note c	700	4.7 U	130	170	4.9 U	5.0 U	5.4	130	4.6 U	95	5.0 U	4.8 U	11	NA	62	4.4 U
Chrysene	See Note c	840	4.7 U	190	520	4.9 U	5.9	6.9	150	4.6 U	140	5.0 U	4.8 U	17	NA	99	4.4 U
Benzo(b)fluoranthene	See Note c	450	4.7 U	98	780	4.9 U	5.0 U	6.9	90	4.6 U	79	5.0 U	4.8 U	12	NA	58	4.4 U
Benzo(k)fluoranthene	See Note c	450	4.7 U	98	510	4.9 U	5.0 U	6.9	90	4.6 U	79	5.0 U	4.8 U	11	NA	52	4.4 U
Benzo(a)pyrene**	140[b]	**730**	4.7 U	**160**	**510**	4.9 U	5.0 U	9.3	**180**	4.6 U	140	5.0 U	4.8 U	14	NA	78	4.4 U
Indeno(1,2,3-cd)pyrene	See Note c	330	4.7 U	77	580	4.9 U	5.0 U	8.8	82	4.6 U	62	5.0 U	4.8 U	12	NA	43	4.4 U
Dibenzo(a,h)anthracene	See Note c	140	4.7 U	42	320	4.9 U	5.0 U	4.9 U	34	4.6 U	25	5.0 U	4.8 U	5.0 U	NA	20	4.4 U
TTEC**	140[b]	**945**	NA	**206**	**751**	NA	0.06	12	**224**	NA	**175**	NA	NA	19	NA	102	NA
PCBs (ug/kg)																	
Aroclor 1016	5,600[b]	1,800 UJ	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA
Aroclor 1242	NE	1,800 UJ	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA
Aroclor 1248	NE	43,000 J	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	94 J	33 UJ	NA
Aroclor 1254**	1,600[b]	**25,000 J**	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	78 J	33 UJ	NA
Aroclor 1260	NE	6,900 J	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	49 UJ	33 UJ	NA
Aroclor 1221	NE	1,800 UJ	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA
Aroclor 1232	NE	1,800 UJ	32 UJ	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA
Total PCBs**	1,000[a]	**74,900 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	172 J	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	32[b]	9 J	NA	5 UJ	5 UJ	NA	5 UJ	5 UJ	5 UJ	NA	5 UJ	NA	5 UJ	5 UJ	NA	5 UJ	NA
Arsenic**	20[a]	**45**	6 U	17	8	NA	6	5	7	NA	7	NA	6	8	NA	8	NA
Cadmium	80[b]	0.5	NA	0.2 U	0.2 U	NA	0.2 U	0.2 U	0.2 U	NA	0.2 U	NA	0.2 U	0.2 U	NA	0.2 U	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	35.1	NA	29.1	27.3	NA	22.3	19.4	26.5	NA	24.4	NA	28.6	30.7	NA	24.1	NA
Copper**	3,200[b]	298	9.5	24.8	27	NA	10.9	6.9	12	NA	11.4	NA	7.3	31.2	NA	20.5	NA
Lead**	250[a]	133	2 U	19	18	NA	4	2 U	5	NA	5	NA	2 U	9	NA	14	NA
Nickel	1,600[b]	30	NA	30	28	NA	23	23	28	NA	25	NA	27	35	NA	25	NA
Zinc	24,000[b]	327	30	72	65	NA	29	24	32	NA	32	NA	27	51	NA	43	NA
VOCs (ug/kg)																	
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																	
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
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U - Compound was analyzed for but not detected above the reporting limit shown
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R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
$\boxed{\textbf{BOLD}}$ Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	**Preliminary Cleanup Levels**	SB-89	SB-89	SB-90	SB-91	SB-91	SB-92	SB-92	SB-93	SB-93	SB-93	SB-93	SB-93A	SB-93A	SB-93A	SB-94	SB-94	SB-94
Sample ID Depth Interval (feet bgs):		SS	0 - 0.5	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3	8	10	10	14	6	10	15	5	10	15
Date Collected:		10/29/2009	10/29/2009	10/29/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/25/2010	6/25/2010	6/25/2010	6/24/2010	6/24/2010	6/24/2010
Field QC:											Field Duplicate							
TPH (mg/kg)																		
Diesel-range**	2,000[a]	NA	NA	NA	NA	NA	NA	NA	1,900 J	25 J	28 J	52 J	6.9 UJ	6.6 UJ	6.2 UJ	53 J	200 J	1,900 J
Oil-range**	2,000[a]	NA	NA	NA	NA	NA	NA	NA	110 J	14 UJ	13 UJ	13 UJ	14 UJ	13 UJ	12 UJ	380 J	12 UJ	80 J
PAHs (ug/kg)																		
Benzo(a)anthracene	See Note c	300	1400	80	530	1300	8.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	360	1800	130	760	1700	12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	190	740	48	390	910	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	190	740	48	390	910	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	**370**	**1,400**	69	**690**	**1,600**	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	170	480	34	330	760	6.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	88	240	12	150	400	4.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	**467**	**1,778**	93	**877**	**2,045**	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	32[b]	5 UJ	NA	5 UJ	5 UJ	NA	5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	7	NA	7	8	NA	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	80[b]	0.2 U	NA	0.2 U	0.2 U	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	26	NA	19.8	26.1	NA	23.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	3,200[b]	19.3	NA	10	30.6	NA	11.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead**	250[a]	10	NA	4	18	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600[b]	27	NA	26	33	28	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	44	NA	43	49	NA	579	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (ug/kg)																		
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	27 J	NA	NA	NA	NA	NA	NA	R	R
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	4.9 J	NA	NA	NA	NA	NA	NA	5.1 J	R
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	1.4 J	NA	NA	NA	NA	NA	NA	1.4 J	R
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	0.9 J	R
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	1.0 J	NA	NA	NA	NA	NA	NA	0.8 J	R
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	290 J
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	0.8 J	NA	NA	NA	NA	NA	NA	R	460 J
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	1.1 J	R
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	1.1 J	NA	NA	NA	NA	NA	NA	3.3 J	260 J
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	120 J
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	R	R
SVOCs (ug/kg)																		
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c]Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d]Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID: / Sample ID Depth Interval (feet bgs): / Date Collected: / Field QC:	**Preliminary Cleanup Levels**	SB-95 8 6/24/2010	SB-95 11 6/24/2010	SB-95 14 6/24/2010	SB-96 8 6/24/2010	SB-96 11 6/24/2010	SB-96 14 6/24/2010	SB-97 7 6/24/2010	SB-97 11 6/24/2010	SB-97 14 6/24/2010	SB-98 6 6/24/2010	SB-98 10 6/24/2010	SB-98 15 6/24/2010	SB-100 5 6/25/2010	SB-100 10 6/25/2010	SB-100 14 6/25/2010	SB-101 5 6/25/2010	SB-101 15 6/25/2010
TPH (mg/kg)																		
Diesel-range**	2,000[a]	**3,100 J**	24 J	290 J	**3,300 J**	**2,100 J**	1,200 J	5.6 UJ	96 J	**2,800 J**	5.1 UJ	560 J	23 J	**2,000 J**	**4,600 J**	**2,800 J**	**2,000 J**	**3,100 J**
Oil-range**	2,000[a]	110 J	13 UJ	22 J	260 J	140 J	50 J	11 UJ	13 UJ	110 J	10 UJ	120 J	13 UJ	100 J	210 J	180 J	77 J	190 J
PAHs (ug/kg)																		
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	80[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	3,200[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead**	250[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (ug/kg)																		
Methylene chloride	130,000[b]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	R	NA	58 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	R	NA	100 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	R	NA	78 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	R	NA	87 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	R	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																		
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
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SS - sub-slab soil sample
J - Estimated value

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[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	**Preliminary Cleanup Levels**	SB-102	SB-102	SB-102	SB-103	SB-103	SB-103	SB-104	SB-105	SB-105	SB-106	SB-106	SB-107	SB-107	SB-107	SS1	SS2	SS3	SS4	SS5
Sample ID Depth Interval (feet bgs):		5	11	14	6	10	13	5	6	11	5	10	5	10	13	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Date Collected:		6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	3/4/2003	3/5/2003	3/4/2003	3/4/2003	3/4/2003
Field QC:																				
TPH (mg/kg)																				
Diesel-range**	2,000[a]	**8,400 J**	**4,800 J**	1,300 J	6.2 UJ	6.4 UJ	1,300 J	6.7 J	5.5 UJ	8.0 UJ	6.8 UJ	7.2 UJ	5.8 UJ	7.1 UJ	6.6 UJ	25U	50U	25U	570	25U
Oil-range**	2,000[a]	350 J	200 J	54 J	12 UJ	13 UJ	45 J	10 UJ	11 UJ	16 UJ	14 UJ	22 J	12 UJ	14 UJ	17 J	280	680	260	870	450
PAHs (ug/kg)																				
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																				
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																				
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																				
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4U	12U	14U	**84**	**210**
Cadmium	80[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.56U	2.0U	2.3U	2.9	3.2
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	51	150	51	96
Copper**	3,200[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	750	2,000	2,600	1,400	2,000
Lead**	250[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24	28	230	240	**550**
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,100	990	3,100	1,600	2,800
VOCs (ug/kg)																				
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																				
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
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** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	**Preliminary Cleanup Levels**	SS6	SS-1	SS-1	SS-2	SS-2	SS-4	SS-4	SS-5	SS-5	SS-5	SS-6	SS-6	SS-7	SS-7	SS-8	SS-8	SS-8
Sample ID Depth Interval (feet bgs):		0 - 1	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	5.0 - 5.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	1.0 - 1.5	3.0 - 3.5
Date Collected:		3/5/2003	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/12/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007
Field QC:																	Field Duplicate	
TPH (mg/kg)																		
Diesel-range**	2,000[a]	25U	120	NA	**5,500**	21*	810*	NA	720*	**2,700***	890	68	NA	26	NA	220 J*	130 J	NA
Oil-range**	2,000[a]	130	190	NA	**26,000**	180	1,800	NA	**3,300***	**10,000***	320	30	NA	36	NA	590	410	NA
PAHs (ug/kg)																		
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	3.1U	**21.9**	18.1 J	**24.8**	10.8 J	16.3	4.36	15.2	16.1	NA	5.58	9.21 J	3.74	5.68 J	**89.0 J**	**27.0 J**	4.19 J
Cadmium	80[b]	0.51U	0.596 U	0.602 U	0.549	0.540 U	0.600 U	0.552 U	0.722	0.660 U	NA	0.564 U	0.556 U	0.546 U	0.625 U	0.960	0.985	0.562 U
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	3,200[b]	84	51.3 J	41.9 J	135 J	32.7 J	172	11.8	1,280	44.6	NA	16.4	40.2 J	11.5	15.4 J	1,400	539	48.0
Lead**	250[a]	13	16.0	14.2 J	91.4	9.17 J	82.0	2.81	**305**	10.3	NA	3.37	10.3 J	4.57	6.27 J	**697 J**	189 J	3.46 J
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	120	101 J	111 J	95.5 J	73.2 J	178	31.5	501	86.4	NA	63.5	73.8 J	35.9	37.1 J	1,370 J	732 J	73.9
VOCs (ug/kg)																		
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																		
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID: Sample ID Depth Interval (feet bgs): Date Collected: Field QC:	**Preliminary Cleanup Levels**	SS-9 1.0 - 1.5 4/2/2007	SS-9 3.0 - 3.5 4/2/2007	SS-10 1.0 - 1.5 4/2/2007	SS-10 3.0 - 3.5 4/2/2007	SS-11 1.0 - 1.5 4/2/2007	SS-11 3.0 - 3.5 4/2/2007	SS-12 1.0 - 1.5 4/2/2007	SS-12 3.0 - 3.5 4/2/2007	SS-13 1.0 - 1.5 4/2/2007	SS-13 3.0 - 3.5 4/2/2007	SS-14 1.0 - 1.5 4/12/2007	SS-14 3.0 - 3.5 4/12/2007	SS-15 1.0 - 1.5 4/2/2007	SS-15 3.0 - 3.5 4/2/2007
TPH (mg/kg)															
Diesel-range**	2,000[a]	30*	NA	140*	NA	25*	NA	220*	NA	140	NA	370*	NA	7.7*	NA
Oil-range**	2,000[a]	110	NA	460	NA	120*	NA	570	NA	870	NA	720	NA	34	NA
PAHs (ug/kg)															
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)															
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)															
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)															
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	9.54	5.60 J	**38.2**	4.84 J	**79.1**	3.74 J	**461**	6.94	**64.4**	8.07 J	**687**	14.5 J	5.51	NA
Cadmium	80[b]	0.437 U	0.579 U	0.546	0.562 U	1.01	0.571 U	1.25	0.482 U	1.08	0.531 U	2.12	0.479 U	0.517 U	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	3,200[b]	45.9	17.9 J	648	9.87 J	82.5	8.79 J	3,080	22.6	1,310	47.9 J	**3,350**	58.1 J	8.28	23.8
Lead**	250[a]	11.3	4.04 J	190	2.69 J	79.3	2.05 J	**810**	11.8	**604**	17.1 J	**1,910**	20.8 J	2.21	NA
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	245	45.2 J	668	28.5 J	285	27.7 J	1,880	252	799	59.9 J	2,100	121 J	24.0	39.2
VOCs (ug/kg)															
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)															
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340 shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Levels	SS-16	SS-16	SS-17	SS-17	SS-18	SS-18	SS-19	SS-19	SS-20	SS-20	SS-21	SS-21	SS-22	SS-22	SS-22	SS-23	SS-23
Sample ID Depth Interval (feet bgs):		1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	5.0 - 5.5	1.0 - 1.5	3.0 - 3.5
Date Collected:		4/2/2007	4/2/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007
Field QC:																		
TPH (mg/kg)																		
Diesel-range**	2,000[a]	5.4 U	NA	5.3 U	NA	5.2 U	NA	5.2 U	NA	970*	30	5.5 U	NA	**4,800**	1,200	170	5.6*	NA
Oil-range**	2,000[a]	12*	NA	10 U	NA	10 U	NA	10 U	NA	1,100	36	11 U	NA	110	150*	14*	16	NA
PAHs (ug/kg)																		
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	20[a]	5.78	NA	3.82	NA	2.99	NA	4.31	NA	3.19	NA	4.31	NA	2.57	NA	NA	4.70	NA
Cadmium	80[b]	0.748	NA	0.561 U	NA	0.550 U	NA	0.532 U	NA	0.642 U	NA	0.569 U	NA	0.577 U	NA	NA	0.645 U	NA
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	3,200[b]	21.4	12.6	18.6	202	7.52	40.5	8.40	51.8	25.1	10.6	9.47	7.30	10.8	69.1	NA	25.8	22.4
Lead**	250[a]	5.21	NA	1.85	NA	1.66	NA	2.00	NA	3.97	NA	2.09	NA	2.06	NA	NA	4.06	NA
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	24,000[b]	462	29.7	77.7	116	26.2	57.7	25.8	87.1	69.3	23.4	22.9	24.3	22.9	57.3	NA	40.0	54.6
VOCs (ug/kg)																		
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																		
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
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[a]MTCA Method A Soil Cleanup Level
[b]MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e]Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f]Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Levels	SS-24	SS-24	SS-25	SS-25	SS-26	SS-26	SS-27	SS-27	SS-28	SS-28	SS-29	SS-29	SS-30	SS-31	SS-32	
Sample ID Depth Interval (feet bgs):		1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5				
Date Collected:		4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	1/21/2009	1/21/2009	1/6/2009	
Field QC:																	Field Duplicate
TPH (mg/kg)																	
Diesel-range**	2,000[a]	9.2*	NA	150*	140	53*	NA	40*	NA	150*	NA	33*	5.8 U	240	140	120	83
Oil-range**	2,000[a]	28*	NA	380	66	180*	NA	150	NA	490*	NA	140	26*	620	420	250	190
PAHs (ug/kg)																	
Benzo(a)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	690	1,400	580	490
Chrysene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,000	2,000	690	610
Benzo(b)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	990	1,700	540	510
Benzo(k)fluoranthene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	990	1,700	540	510
Benzo(a)pyrene**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1,300**	**1,600**	**660**	**600**
Indeno(1,2,3-cd)pyrene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	920	810	420	410
Dibenzo(a,h)anthracene	See Note c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	400	360	170	170
TTEC**	140[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1,709**	**2,217**	**892**	**815**
PCBs (ug/kg)																	
Aroclor 1016	5,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	1,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	7,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	32[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30 U	**320**	**40**	**50**
Arsenic**	20[a]	6.87	NA	**196**	**29.8 J**	4.46	NA	**39.6**	4.32 J	**132**	3.03 J	4.17	NA	**140**	**2,220**	**310**	**350**
Cadmium	80[b]	0.538 U	NA	0.896	0.696 U	0.606 U	NA	0.607 U	0.696 U	1.04	0.613 U	0.519 U	NA	1	5	2	2
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	147	136	81	85
Copper**	3,200[b]	13.3	22.5	1,240	61.1 J	14.2	31.9	207	16.7 J	902	9.28 J	16.5	11.2	**3,340**	**3,710**	2,040	2,180
Lead**	250[a]	4.00	NA	**444**	7.16 J	3.90	NA	45.5	2.47 J	189	2.41 J	5.20	NA	**330**	**1,740**	**380**	**390**
Nickel	1,600[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	90	70	34	32
Zinc	24,000[b]	221	39.1	1,830	66.0 J	49.0	49.2	148	37.5 J	1,640	31.2 J	37.5	33.8	3,110	7,790	2,320	1,980
VOCs (ug/kg)																	
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)																	
Pentachlorophenol	2,500[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	71,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-1
Summary of Soil Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	Preliminary Cleanup Levels	SS-33	SS-34		SS-35	SS-36	SS-37	SS-38	SS-39	SS-39	SS-40	SS-41-2
Sample ID Depth Interval (feet bgs):									0.5 - 1	1 - 2		
Date Collected:		1/6/2009	1/21/2009		1/6/2009	1/6/2009	1/21/2009	1/6/2009	12/4/2008	12/4/2008	12/3/2008	12/3/2008
Field QC:				Field Duplicate								
TPH (mg/kg)												
Diesel-range**	2,000[a]	150	100	100	78	200	100	1,900	59	NA	5.1 U	180
Oil-range**	2,000[a]	190	120	160	270	720	350	1,400	370	NA	10 U	490
PAHs (ug/kg)												
Benzo(a)anthracene	See Note c	140 J	220 J	490	260	1,100	600	880	130	4.6 U	12	2,000
Chrysene	See Note c	160 J	360 J	920	320	1,300	1,000	1,300	150	4.6 U	20	2,200
Benzo(b)fluoranthene	See Note c	140 J	450 J	700	280	1,100	870	1,200	110	4.6 U	14	2,400
Benzo(k)fluoranthene	See Note c	140 J	450 J	700	280	1,100	1,200	1,200	110	4.6 U	12	2,100
Benzo(a)pyrene**	140[b]	**170 J**	**370 J**	**530**	**220**	**940**	**710**	**1,400**	130	4.6 U	16	**2,000**
Indeno(1,2,3-cd)pyrene	See Note c	90 J	240	260	110	630	240 J	830	77	4.6 U	9.1	1,200
Dibenzo(a,h)anthracene	See Note c	38 J	110	120	46	260	4.7 U	350	35	4.6 U	4.6 U	590
TTEC**	140[b]	**226 J**	**521 J**	**766**	**321**	**1,372**	**1,011 J**	**1,859**	**178**	NA	21	**2,851**
PCBs (ug/kg)												
Aroclor 1016	5,600[b]	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	330 U
Aroclor 1242	NE	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	330 U
Aroclor 1248	NE	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	820 UJ
Aroclor 1254**	1,600[b]	79	NA	NA	NA	NA	140	NA	NA	NA	NA	**2,200**
Aroclor 1260	NE	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	460
Aroclor 1221	NE	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	330 U
Aroclor 1232	NE	31 U	NA	NA	NA	NA	65 U	NA	NA	NA	NA	330 U
Total PCBs**	1,000[a]	79	NA	NA	NA	NA	140	NA	NA	NA	NA	**2,660**
Organotins (ug/kg)												
Tributyltin as TBT Ion	7,400	59	NA	NA	NA	NA	530	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NE	130	NA	NA	NA	NA	380	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	63	NA	NA	NA	NA	260	NA	NA	NA	NA	NA
Metals (mg/kg)												
Antimony**	32[b]	30 U	30 U	30 U	30 U	**140**	**80**	**150**	27 J	NA	5 U	**100**
Arsenic**	20[a]	**30**	**140**	**130**	**130**	**530**	**480**	**660**	**134 J**	5 U	5	**1,110**
Cadmium	80[b]	1.0 U	1	1	2	2.3	3	2.7	0.9	NA	0.3	11
Chromium	120,200 (Cr^{3+})[b]/240 (Cr^{6+})[b]	53	58	62	101	75	128	146	40.5	NA	21.1	83
Copper**	3,200[b]	2,250	3,140	3,130	**3,330**	1,870	1,900	2,210	305	9.1	49.9	2,700
Lead**	250[a]	40	90	90	180	**799**	**810**	**881**	182 J	NA	39	**1,270**
Nickel	1,600[b]	28	38	37	46	35	67	25	27	NA	21	32
Zinc	24,000[b]	890	800	667	2,300	2,310	3,690	1,730	655	87	128	7,720
VOCs (ug/kg)												
Methylene chloride	130,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	3,200[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	5,600[d]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	30[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,900[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	7,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	6,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	9,000[a,f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	16,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	800,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NE[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	8,000,000[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5,000[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)												
Pentachlorophenol	2,500[b]	300 U	NA	NA	NA	NA	310 U	NA	NA	NA	NA	290
Bis(2-Ethylhexyl)phthalate	71,000[b]	61 U	NA	NA	NA	NA	220	NA	NA	NA	NA	1,500

Notes:
NA - Not analyzed or not available
NE - Not established
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile Organic Compounds
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
SS - sub-slab soil sample
J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
[a] MTCA Method A Soil Cleanup Level
[b] MTCA Method B Soil Cleanup Level - Direct contact
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene
[d] Protection of Marine Surface Water
[e] Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
[f] Cleanup level is for total xylenes
BOLD Exceeds preliminary cleanup level
* Chromatographic profile does not match the laboratory standard chromatogram
** Indicator Hazardous Substance

Table 4-2
Summary of Soil TCLP Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

Sample ID:	**Dangerous Waste Criteria**	SB-55	SB-72	SB-75	SB-78	SB-79	SS3*	SS5*	SS-12	SS-14	SS-25	SS-28
Sample ID Depth Interval (feet bgs):		0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 -1	0 - 1	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5
Date Collected:	WAC 173-303-090	10/30/2009	10/27/2009	10/28/2009	10/28/2009	10/28/2009	3/4/2003	3/4/2003	4/2/2007	4/2/2007	4/12/2007	4/12/2007
TCLP Metals (mg/L)												
Arsenic	5.0	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	1 U	0.323	0.1 U	0.1 U
Barium	100.0	0.84 J+	2	0.88 J+	0.57 J+	0.32 J+	NA	NA	1 U	1 U	1 U	1 U
Cadmium	1.0	0.01	0.01 U	0.05	0.01	0.01 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Chromium	5.0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	NA	0.133	0.156	0.1 U	0.1 U
Lead	5.0	0.9	4.6	2.2	0.2	0.1	0.12 U	**8.9**	2.2	3.81	0.527	0.1 U
Mercury	0.2	0.0001 UJ	0.0001 UJ	0.0002 J	0.0001 UJ	0.0001 UJ	NA	NA	0.0025 U	0.00308 J	0.00250 UJ	0.00250 UJ
Selenium	1.0	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.750 U	0.1 U	0.1 U	0.1 U
Silver	5.0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	NA	0.1 U	0.05 U	0.05 U	0.05 U

Notes:
J - Estimated value
J+ - Estimated value with a high bias
NA - Not analyzed
TCLP - Toxicity Charactic Leaching Procedure
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
WAC - Washington Administrative Code
* Composite soil samples collected by Landau
Numbers in **bold** font exceed the dangerous waste criteria.
bgs - below ground surface
mg/L - milligrams per liter

Table 4-3
Summary of Groundwater Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Preliminary Cleanup Level	SB-01 12/11/2008	SB-07 12/10/2008	SB-08 12/10/2008	SB-09 12/10/2008	SB-10 12/11/2008	SB-11 12/11/2008	SB-19 12/4/2008	SB-43 10/28/2009	SB-93 6/24/2010	SB-94 6/24/2010	SB-94 6/24/2010 Field Duplicate	SB-95 6/24/2010	LB4 3/5/2003	LB5 3/5/2003	LB6 3/7/2003	LB7 3/5/2003	LB8 3/5/2003	MW-01 3/19/2003	MW-01 1/6/2009	MW-01 4/1/2009
TPH (mg/L)																					
Diesel-range	0.5[a]	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	0.37 J	**6.0 J**	**2.7 J**	0.17 J	0.18	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.25 U	0.25 U
Oil-range	0.5[a]	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	NA	0.20 UJ	1.0 UJ	0.20 UJ	0.20 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.5 U	0.50 U
Organotins (ug/L)																					
Tributyltin as TBT Ion	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19 U	0.008 U
Dibutyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.29 U	0.012 U
Butyl Tin Ion	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.20 U	0.008
Conventional Parameters																					
pH (standard units) [Method 150.1]	6.5-8.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
field pH (standard units)	6.5-8.5	4.88	5.72	6.16	5.65	5.6	5.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.92	6.82
TDS (mg/L) [Method 160.1]	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	449	384
Total Metals (mg/L)																					
Arsenic**	0.005	NA	NA	NA	NA	0.001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.005 U	0.001 U	0.0002 U
Calcium	NE	NA	NA	NA	NA	52.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48.8	45.1
Chromium (total)	0.016	NA	NA	NA	NA	0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.01 U	0.005 U	0.005 U
Copper	0.0031*	NA	NA	NA	NA	0.002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.006 U	0.002	0.002 U
Magnesium	NE	NA	NA	NA	NA	35.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.7	41.3
Nickel	0.01	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.01 U	0.01 U
Zinc	0.081	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.007 U	0.01 U	0.01 U
Dissolved Metals (mg/L)																					
Arsenic	0.005	0.001 U	0.001 U	0.002	0.001	0.001 U	0.001	0.001 U	0.002	NA	NA	NA	NA	0.005 U	0.005 U	NA	NA	NA	NA	0.001 U	0.0002 U
Calcium	NE	109	101	142	129	54.4	131	104	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50.8	47.7
Chromium (total)	0.016	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA	NA	NA	NA	0.01 U	0.01 U	NA	NA	NA	NA	0.005 U	0.005 U
Copper	0.0031*	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003	NA	NA	NA	NA	0.006 U	0.006 U	NA	NA	NA	NA	0.002 U	0.002 U
Magnesium	NE	33.2	63.3	74.5	85.5	36.4	29.0	37.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	45.5	43.2
Nickel**	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.01 U	0.01 U
Zinc**	0.081	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	NA	NA	NA	NA	0.007 U	0.007 U	NA	NA	NA	NA	0.01 U	0.01 U
VOCs (ug/L) [Method 8260B]																					
Chloromethane	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2	NA	R	R	R	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
Acetone	7,200	NA	4.1	NA	NA	5.5 U	6.6 U	3.0 U	NA	R	R	R	R	NA	25 U	25 U	25 U	NA	25 U	3.0 U	2.5 U
Carbon disulfide	800	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	R	0.2 J	R	NA	NA	NA	NA	NA	NA	0.2 U	0.2 U
1,2-Dichloroethane (EDC)	37	NA	0.2 U	NA	NA	0.2 U	0.5	0.2 U	NA	R	R	R	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	4.0	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
Toluene	15,000	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	0.3 J	R	R	R	NA	4 U	4 U	4 U	NA	4 U	0.2 U	0.2 U
m,p-Xylene	1,600	NA	0.4 U	NA	NA	0.4 U	0.4 U	0.4 U	NA	0.4 J	R	R	R	NA	2 U	2 U	2 U	NA	2 U	0.4 U	0.4 U
o-Xylene	1,600	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	0.3 J	0.2 J	0.3 J	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
1,2,4-Trimethylbenzene	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	0.4 J	0.3 J	0.3 J	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
Isopropylbenzene	800	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	0.2 J	6.1 J	5.4 J	1.1 J	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
n-Propylbenzene	800	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	0.2 J	6.8 J	6.1 J	1.2 J	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
tert-Butylbenzene	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	0.2 J	0.2 J	R	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
sec-Butylbenzene	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	2.0 J	2.0 J	0.8 J	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
n-Butylbenzene	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	0.8 J	0.8 J	0.6 J	NA	2 U	2 U	2 U	NA	2 U	0.2 U	0.2 U
Naphthalene	NE	NA	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	1.0 U	R	R	R	R	NA	2 U	2 U	2 U	NA	2 U	0.5 U	0.027 U
Methyl tert-butyl ether (MTBE)	NE	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	NA	2 U	2 U	2 U	NA	2 U	4.6	2.3
Low-Level VOCs (ug/L) [Method 8260 SIM]																					
Tetrachloroethene	3.3	NA	0.074	NA	NA	0.020 U	0.2 U	0.020 U	NA	R	R	R	R	NA	NA	NA	NA	NA	NA	0.020 U	0.020 U
SVOCs (ug/L)																					
4-Methylphenol	NE	NA	1.0 U	NA	NA	NA	NA	1.0 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA	NA	2 U	1.0 U	1.0 U
Hexachloroethane	3.3	NA	1.0 U	NA	NA	NA	NA	1.0 UJ	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA	NA	2 U	1.0 U	1.0 U
Benzoic acid	NE	NA	10 U	NA	NA	NA	NA	10 UJ	10 U	NA	NA	NA	NA	NA	20 U	NA	NA	NA	20 U	10 U	10 U
Dibenzofuran	16	NA	1.0 U	NA	NA	NA	NA	0.010	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA	NA	2 U	1.0 U	0.010 U
Fluorene	5,300	NA	1.0 U	NA	NA	NA	NA	0.016	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA	NA	2 U	1.0 U	0.010 U
bis(2-Ethylhexyl)phthalate**	2.2	NA	1.0 U	NA	NA	NA	NA	1.0 U	13 U	NA	NA	NA	NA	NA	3 U	NA	NA	NA	3 U	1.0 U	1.0 U

Notes:
List of constituents has been abbreviated only to show compounds reported at concencentrations exceeding screening criteria
Results exceeding Preliminary Cleanup Level are **BOLD**
Screening criteria established in Table 13
SVOCs - Semivolatile Organic Compounds
NA - Not analyzed or not available
NE - Not established
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons

mg/L - milligrams per liter
ug/L - micrograms per liter
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
* National Recommended Water Quality Criteria-Clean Water Act Standard, recently approved by Ecology as a groundwater cleanup level protective of marine surface water for the Port of Everett West En
** Indicator Hazardous Substance

Table 4-3
Summary of Groundwater Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Preliminary Cleanup Level	MW-02					MW-03	MW-04				MW-05		MW-06				MW-07					
		3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	10/13/2009	10/13/2009 Field Duplicate	1/6/2009	1/6/2009 Field Duplicate	4/1/2009	7/9/2009	7/9/2009 Field Duplicate	10/13/2009
TPH (mg/L)																							
Diesel-range	0.5[a]	0.13 U	0.25 U	0.25 U	NA	NA	0.21	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	NA	NA	
Oil-range	0.5[a]	0.25 U	0.5 U	0.50 U	NA	NA	0.25 U	0.5 U	0.50 U	NA	NA	0.5 U	0.50 U	0.5 U	0.50 U	NA	NA	0.5 U	0.5 U	0.50 U	NA	NA	
Organotins (ug/L)																							
Tributyltin as TBT Ion	0.01	NA	0.19 U	0.008 U	NA	NA	NA	0.19 U	0.008 U	NA	NA	0.19 U	0.008 U	0.19 U	0.008 U	NA	NA	0.19 U	0.19 U	0.008 U	NA	NA	NA
Dibutyl Tin Ion	NE	NA	0.29 U	0.012 U	NA	NA	NA	0.29 U	0.012 U	NA	NA	0.29 U	0.012 U	0.29 U	0.02	NA	NA	0.29 U	0.29 U	0.012 U	NA	NA	NA
Butyl Tin Ion	NE	NA	0.20 U	0.024	NA	NA	NA	0.20 U	0.008 U	NA	NA	0.20 U	0.008 U	0.20 U	0.013	NA	NA	0.20 U	0.20 U	0.008 U	NA	NA	NA
Conventional Parameters																							
pH (standard units) [Method 150.1]	6.5-8.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
field pH (standard units)	6.5-8.5	NA	6.5	6.7	6.05	5.72	NA	6.58	6.11	6.54	6.67	6.82	6.62	6.82	6.80	6.60	6.60	6.04	6.04	5.53	5.86	5.86	6.40
TDS (mg/L) [Method 160.1]	NE	NA	186	480	NA	NA	NA	613	644	NA	NA	412	154	521	198	NA	NA	163	156	188	NA	NA	NA
Total Metals (mg/L)																							
Arsenic**	0.005	0.005 U	0.001	0.0007	0.001 U	0.001 U	0.005 U	**0.025**	**0.0094**	**0.011**	**0.006**	0.001	0.0013	0.001 U	**0.0066**	0.004	0.005	0.002 U	0.002	0.0004	0.001 U	0.001 U	0.004
Calcium	NE	NA	22.8	63.8	NA	NA	NA	122	117	NA	NA	114	92.4	61.2	27.3	NA	NA	29.6	29.3	31.6	NA	NA	NA
Chromium (total)	0.016	0.01 U	0.005 U	0.005 U	NA	NA	0.01 U	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	NA	NA	NA
Copper	0.0031*	0.006 U	0.003	0.002 U	**0.004**	0.002	0.006 U	**0.006**	0.002 U	0.002 U	0.002	0.002 U	0.002 U	0.002 U	0.002 U	**0.016**	**0.020**	**0.004**	**0.005**	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	NE	NA	6.6	45.8	NA	NA	NA	25.7	19.8	NA	NA	5.13	3.85	37.6	6.82	NA	NA	6.0	5.95	7.84	NA	NA	NA
Nickel	0.01	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01	**0.02**	0.01	0.01	**0.03**	0.01 U	0.01 U	0.01 U
Zinc	0.081	0.007 U	0.01 U	0.01 U	0.01 U	0.01 U	0.007 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.02	0.03	**0.41**	**0.42**	0.01	0.01 U	0.01 U	0.01 U
Dissolved Metals (mg/L)																							
Arsenic	0.005	NA	0.001 U	0.0006	0.001 U	0.001 U	NA	**0.02**	**0.009**	**0.010**	**0.006**	0.001 U	0.0013	0.001 U	**0.007**	0.001 U	0.001	0.002 U	0.002 U	0.0003	0.001 U	0.001 U	0.003
Calcium	NE	NA	20.7	65.4	NA	NA	NA	113	119	NA	NA	104	94.3	56.7	28.3	NA	NA	27.2	27.8	34.2	NA	NA	NA
Chromium (total)	0.016	NA	0.005 U	0.005 U	NA	NA	NA	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	NA	NA	NA
Copper	0.0031*	NA	0.002 U	0.002 U	0.002 U	0.002 U	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003	0.003	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	NE	NA	5.9	45.3	NA	NA	NA	23.2	20.7	NA	NA	4.66	3.94	35.1	7.1	NA	NA	5.46	5.69	9.11	NA	NA	NA
Nickel**	0.01	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.03**	0.01 U	0.01 U	0.01 U
Zinc**	0.081	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.42**	**0.42**	0.01	0.01 U	0.01 U	0.01 U
VOCs (ug/L) [Method 8260B]																							
Chloromethane	NE	2 U	0.2 U	0.3 U	NA	NA	NA	0.3 U	0.4 U	NA	NA	0.2 U	0.3 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.6 U	NA	NA	NA
Acetone	7,200	25 U	5.6 U	2.5 U	NA	NA	NA	4.9 U	2.5 U	NA	NA	3.0 U	2.5 U	3.0 U	2.8 U	NA	NA	3.0 U	3.2 U	2.8 U	NA	NA	NA
Carbon disulfide	800	NA	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloroethane (EDC)	37	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	4.0	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2	0.2 U	0.2 U	NA	NA	NA
Toluene	15,000	4 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
m,p-Xylene	1,600	2 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	0.2 U	0.2 U	0.4 U	NA	NA	NA
o-Xylene	1,600	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.4 U	0.4 U	0.2 U	NA	NA	NA
1,2,4-Trimethylbenzene	NE	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
Isopropylbenzene	800	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
n-Propylbenzene	800	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
tert-Butylbenzene	NE	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
sec-Butylbenzene	NE	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
n-Butylbenzene	NE	2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA
Naphthalene	NE	2 U	0.5 U	0.027 U	1.0 U	1.0 U	NA	0.5 U	0.014 U	1.0 U	1.0 U	0.5 U	0.019 U	0.5 U	0.010 U	1.0 U	1.0 U	0.5 U	0.5 U	0.017 U	1.0 U	1.0 U	1.0 U
Methyl tert-butyl ether (MTBE)	NE	2 U	1.1	1	NA	NA	NA	0.2 U	0.5 U	NA	NA	0.2 U	0.5 U	0.8	0.9	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA
Low-Level VOCs (ug/L) [Method 8260 SIM]																							
Tetrachloroethene	3.3	NA	0.020 U	0.020 U	NA	NA	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.2	0.2	0.09	NA	NA	NA
SVOCs (ug/L)																							
4-Methylphenol	NE	2 U	1.0 U	1.2 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	3.3	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachloroethane	3.3	2 U	1.0 U	1.2 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzoic acid	NE	20 U	10 U	12 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	16	2 U	1.0 U	0.010 U	1.0 U	1.0 U	NA	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.011	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U
Fluorene	5,300	2 U	1.0 U	0.010 U	1.0 U	1.0 U	NA	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate**	2.2	3 U	**80 J**	1.2 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	3.9 U	1.0 U	14 U	1.2 U	1.0 U	1.0 U	**260 J**	4.6 UJ	**2.3**	1.0 U	1.0 U	1.0 U

Notes:
List of constituents has been abbreviated only to show compounds reported at concencentrations exceeding screening criteria
Results exceeding Preliminary Cleanup Level are **BOLD**
Screening criteria established in Table 13
SVOCs - Semivolatile Organic Compounds
NA - Not analyzed or not available
NE - Not established
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons

mg/L - milligrams per liter
ug/L - micrograms per liter
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
* National Recommended Water Quality Criteria-Clean Water Act Standard, recently approved by Ecology as a groundwater cleanup level protective of marine surface water for the Port of Everett West End Site.
** Indicator Hazardous Substance

Table 4-3
Summary of Groundwater Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Preliminary Cleanup Level	MW-08 1/6/2009	MW-08 4/1/2009	MW-09 1/6/2009	MW-09 4/1/2009	MW-10 1/6/2009	MW-10 4/1/2009
TPH (mg/L)							
Diesel-range	0.5[a]	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Oil-range	0.5[a]	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U
Organotins (ug/L)							
Tributyltin as TBT Ion	0.01	0.19 U	0.008 U	0.19 U	0.008 U	0.19 U	0.008 U
Dibutyl Tin Ion	NE	0.29 U	0.012 U	0.29 U	0.012 U	0.29 U	0.012 U
Butyl Tin Ion	NE	0.20 U	0.008 U	0.20 U	0.008 U	0.20 U	0.008 U
Conventional Parameters							
pH (standard units) [Method 150.1]	6.5-8.5	NA	NA	NA	NA	NA	NA
field pH (standard units)	6.5-8.5	6.91	6.94	7.1	6.7	6.64	6.55
TDS (mg/L) [Method 160.1]	NE	790	779	721	752	715	470
Total Metals (mg/L)							
Arsenic**	0.005	0.002	0.0008	0.003	0.0013	0.002	0.0012
Calcium	NE	157	168	137	161	89.0	96.5
Chromium (total)	0.016	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Copper	0.0031*	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	NE	63.7	66.9	45.7	50.8	59.4	69.5
Nickel	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Zinc	0.081	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dissolved Metals (mg/L)							
Arsenic	0.005	0.002	0.0007	0.002	0.0013	0.002 U	0.001
Calcium	NE	150	168	128	160	85.2	99
Chromium (total)	0.016	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Copper	0.0031*	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Magnesium	NE	60.8	67.4	42.1	52.1	55.5	75.0
Nickel**	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Zinc**	0.081	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
VOCs (ug/L) [Method 8260B]							
Chloromethane	NE	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	0.4 U
Acetone	7,200	3.0 U	2.5 U	3.0 U	2.5 U	5.8 U	2.5 U
Carbon disulfide	800	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane (EDC)	37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	4.0	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	15,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
m,p-Xylene	1,600	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene	1,600	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trimethylbenzene	NE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Isopropylbenzene	800	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene	800	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene	NE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene	NE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Butylbenzene	NE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Naphthalene	NE	0.5 U	0.015 U	0.5 U	0.013 U	0.5 U	0.016 U
Methyl tert-butyl ether (MTBE)	NE	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
Low-Level VOCs (ug/L) [Method 8260 SIM]							
Tetrachloroethene	3.3	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SVOCs (ug/L)							
4-Methylphenol	NE	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachloroethane	3.3	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzoic acid	NE	10 U	12 U	10 U	10 U	10 U	10 U
Dibenzofuran	16	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
Fluorene	5,300	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
bis(2-Ethylhexyl)phthalate**	2.2	1.0 U	1.2 U	1.1 U	1.0 U	4.8 U	1.0 U

Notes:
List of constituents has been abbreviated only to show compounds reported at concencentrations exceeding screening criteria
Results exceeding Preliminary Cleanup Level are **BOLD**
Screening criteria established in Table 13
SVOCs - Semivolatile Organic Compounds
NA - Not analyzed or not available
NE - Not established
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons

mg/L - milligrams per liter
ug/L - micrograms per liter
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
R - Rejected. The presence or absence of this analyte cannot be verified
* National Recommended Water Quality Criteria-Clean Water Act Standard, recently approved by Ecology as a groundwater cleanup level protective of marine surface water for the Port of Everett West End Site.
** Indicator Hazardous Substance

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a] Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	**SC-1-3** 02/10/09 2-4 Feet	**SC-1-5** 02/10/09 4-6 Feet	**SC-1-7** 02/10/09 7-9 Feet	**SC-2-2.5** 02/10/09 1.5-3.5 Feet	**SC-2-4** 02/10/09 3.5-5.5 Feet	**SC-3-1** 02/09/09 0-2 Feet	**SC-3-3** 02/09/09 2-4 Feet	**SC-3-5** 02/09/09 4-6 Feet	**SC-4-2** 02/10/09 1.5-3.5 Feet	**SC-4-4** 02/10/09 3.5-5.5 Feet	**SC-5-2** 02/10/09 1-3 Feet	**SC-5-4** 02/10/09 3-5 Feet	**SC-6-2** 02/09/09 0.75-2.5 Feet	**SC-6-3.5** 02/09/09 3.5-4.75 Feet
VOCs (mg/kg // mg/kgOC)																
1,2,4-Trichlorobenzene*	0.81	1.8	NA	0.020 U / 0.98 U	0.0060 U / 0.35 U	0.020 U / 1.3 U	0.0060 U / 0.31 U	NA	NA	0.0077 U / 0.25 U	NA	0.0070 U / 0.31 U	0.0044 U / 0.87 U	0.019 U / 1.7 U	NA	0.0044 U / 0.52 U
1,2-Dichlorobenzene*	2.3	2.3	NA	0.020 U / 0.98 U	0.0012 U / 0.070 U	0.020 U / 1.3 U	0.0012 U / 0.063 U	NA	NA	0.0015 U / 0.048 U	NA	0.0014 U / 0.061 U	0.00090 U / 0.18 U	0.019 U / 1.7 U	NA	0.0009 U / 0.11 U
1,4-Dichlorobenzene*	3.1	9.0	NA	0.020 U / 0.98 U	0.0012 U / 0.070 U	0.020 U / 1.3 U	0.0012 U / 0.063 U	NA	NA	0.0015 U / 0.048 U	NA	0.0014 U / 0.061 U	0.00090 U / 0.18 U	0.019 U / 1.7 U	NA	0.0009 U / 0.11 U
SVOCs (ug/kg)																
2,4-Dimethylphenol	29	29	NA	20 U	19 U	20 U	20 U	NA	NA	20 U	NA	20 U	20 U	19 U	NA	20 U
2-Methylphenol	63	63	NA	20 U	19 U	20 U	20 U	NA	NA	20 U	NA	20 U	20 U	19 U	NA	20 U
4-Methylphenol	670	670	NA	52	19 U	20 U	20 U	NA	NA	24	NA	20	20 U	19 U	NA	20 U
Benzoic Acid	650	650	NA	200 U	190 U	200 UJ	200 U	NA	NA	200 U	NA	200 U	200 U	190 U	NA	200 U
Benzyl Alcohol	57	73	NA	20 U	19 U	20 U	20 U	NA	NA	20 U	NA	20 U	20 U	19 U	NA	20 U
Pentachlorophenol	360	690	NA	99 U	97 U	99 U	99 U	NA	NA	97 U	NA	99 U	100 U	96 U	NA	98 U
Phenol	420	1,200	NA	20 U	19 U	20 U	20 U	NA	NA	20 U	NA	20 U	20 U	19 U	NA	20 U
SVOCs (mg/kg // mg/kgOC)																
2-Methylnapthalene*	38	64	NA	0.035 / 1.72	0.0065 / 0.38	0.0066 / 0.44	0.0060 / 0.31	NA	NA	0.015 / 0.48	NA	0.0048 / 0.21	0.0094 / 1.9	0.0048 U / 0.43 U	NA	0.015 / 1.8
Acenaphthene*	16	57	NA	0.068 / 3.35	0.0060 / 0.35	0.0090 / 0.60	0.0046 U / 0.24 U	NA	NA	0.026 / 0.84	NA	0.011 / 0.48	0.052 / 10	0.069 / 6.2	NA	0.047 / 5.6
Acenaphthylene*	66	66	NA	0.036 / 1.8	0.0069 / 0.40	0.012 / 0.80	0.0096 / 0.50	NA	NA	0.012 / 0.39	NA	0.0092 / 0.40	0.0094 / 1.9	0.0048 U / 0.43 U	NA	0.0046 U / 0.54 U
Anthracene*	220	1,200	NA	0.071 / 3.5	0.0088 / 0.51	0.022 / 1.5	0.0087 / 0.45	NA	NA	0.036 / 1.2	NA	0.030 / 1.3	0.030 / 5.9	0.0068 / 0.61	NA	0.012 / 1.4
Benz[a]anthracene*	110	270	NA	0.13 / 6.4	0.016 / 0.93	0.11 / 7.3	0.019 / 0.99	NA	NA	0.066 / 2.1	NA	0.098 / 4.3	0.044 / 8.7	0.041 / 3.7	NA	0.028 / 3.3
Benzo[a]pyrene*	99	210	NA	0.076 / 3.7	0.016 / 0.93	0.10 / 6.6	0.021 / 1.1	NA	NA	0.052 / 1.7	NA	0.069 / 3.0	0.024 / 4.8	0.048 / 4.3	NA	0.0082 / 0.97
Benzo(b)fluoranthene	NE	NE	NA	0.11 / 5.4	0.016 / 0.93	0.13 / 8.6	0.015 / 0.78	NA	NA	0.066 / 2.1	NA	0.081 / 3.5	0.025 / 5.0	0.034 / 3.1	NA	0.013 / 1.5
Benzo[g,h,i]perylene*	31	78	NA	0.040 / 2.0	0.012 / 0.70	0.040 / 2.6	0.014 / 0.73	NA	NA	0.028 / 0.90	NA	0.026 / 1.1	0.011 / 2.2	0.023 / 2.1	NA	0.0046 U / 0.54 U
Benzo(k)fluoranthene	NE	NE	NA	0.10 / 4.9	0.013 / 0.76	0.092 / 6.1	0.017 / 0.89	NA	NA	0.059 / 1.9	NA	0.084 / 3.7	0.024 / 4.8	0.053 / 4.8	NA	0.012 / 1.4
Bis[2-ethylhexyl]phthalate*	47	78	NA	0.020 / 0.98	0.019 U / 1.1 U	0.040 / 2.6	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.012 J / 0.52 J	0.076 / 15	0.019 U / 1.7 U	NA	0.013 J / 1.5 J
Butyl Benzyl Phthalate*	4.9	64	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Chrysene*	110	460	NA	0.23 / 11	0.018 / 1.0	0.13 / 8.6	0.023 / 1.2	NA	NA	0.11 / 3.5	NA	0.16 / 7.0	0.045 / 8.9	0.043 / 3.9	NA	0.030 / 3.5
Dibenz[a,h]anthracene*	12	33	NA	0.011 / 0.54	0.0046 U / 0.27 U	0.016 / 1.1	0.0046 U / 0.24 U	NA	NA	0.0088 / 0.28	NA	0.013 / 0.57	0.0047 U / 0.93 U	0.0048 U / 0.43 U	NA	0.0046 U / 0.54 U
Dibenzofuran*	15	58	NA	0.036 / 1.77	0.0046 / 0.27	0.0080 / 0.53	0.0046 / 0.24	NA	NA	0.015 / 0.48	NA	0.0048 / 0.21	0.015 / 3.0	0.029 / 2.6	NA	0.0096 / 1.1
Diethyl Phthalate*	61	110	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Dimethyl Phthalate*	53	53	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Di-n-butyl Phthalate*	220	1,700	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Di-n-octyl Phthalate*	58	4,500	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.04 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Fluoranthene*	160	1,200	NA	0.72 / 35	0.055 / 3.2	0.14 / 9.3	0.053 / 2.8	NA	NA	0.28 / 9.0	NA	0.36 / 16	0.19 / 38	0.065 / 5.9	NA	0.26 / 31
Fluorene*	23	79	NA	0.060 / 3.0	0.0079 / 0.46	0.010 / 0.66	0.0069 / 0.36	NA	NA	0.030 / 0.97	NA	0.011 / 0.48	0.034 / 6.7	0.036 / 3.2	NA	0.050 / 5.9
Indeno[1,2,3-cd]pyrene*	34	88	NA	0.036 / 1.8	0.0079 / 0.46	0.037 / 2.4	0.0096 / 0.50	NA	NA	0.028 / 0.90	NA	0.027 / 1.2	0.0089 / 1.8	0.024 / 2.2	NA	0.0046 U / 0.54 U
Napthalene*	99	170	NA	0.11 / 5.4	0.022 / 1.3	0.021 / 1.4	0.029 / 1.5	NA	NA	0.038 / 1.2	NA	0.025 / 1.1	0.12 / 24	0.082 / 7.4	NA	0.036 / 4.3
N-nitrosodiphenylamine*	11	11	NA	0.020 U / 0.98 U	0.019 U / 1.1 U	0.020 U / 1.3 U	0.020 U / 1.0 U	NA	NA	0.020 U / 0.64 U	NA	0.020 U / 0.87 U	0.020 U / 4.0 U	0.019 U / 1.7 U	NA	0.020 U / 2.4 U
Phenanthrene*	100	480	NA	0.22 / 11	0.038 / 2.2	0.048 / 3.2	0.040 / 2.1	NA	NA	0.090 / 2.9	NA	0.057 / 2.5	0.090 / 18	0.034 / 3.1	NA	0.038 / 4.5
Pyrene*	1,000	1,400	NA	0.52 / 26	0.062 / 3.6	0.21 / 14	0.063 / 3.3	NA	NA	0.22 J / 7.1 J	NA	0.28 / 12	0.18 / 36	0.071 / 6.4	NA	0.15 / 18
Total LPAH*	370	780	NA	0.56 / 28	0.090 / 5.2	0.12 / 8.1	0.094 / 4.9	NA	NA	0.23 / 7.5	NA	0.14 / 6.3	0.34 / 66	0.23 / 21	NA	0.18 / 22
Total HPAH*	960	5,300	NA	2.0 / 97	0.22 / 13	1.0 / 67	0.23 / 12	NA	NA	0.92 J / 30 J	NA	1.2 / 52	0.55 / 110	0.402 / 36	NA	0.50 / 59
Total Benzofluoranthenes*	230**	450**	NA	0.21 / 10	0.029 / 1.7	0.22 / 15	0.032 / 1.7	NA	NA	0.12 / 4.0	NA	0.16 / 7.2	0.049 / 9.7	0.087 / 7.8	NA	0.025 / 3.0
Pesticides (mg/kg // mg/kgOC)																
Hexachlorobenzene*	0.38	2.3	NA	0.00098 U / 0.048 U	0.00097 U / 0.056 U	0.00099 U / 0.066U	0.00099 U / 0.052U	NA	NA	0.00098 U / 0.032 U	NA	0.00098 U / 0.043 U	0.00097 U / 0.192 U	0.00097 U / 0.087 U	NA	0.00099 U / 0.117 U
Hexachlorobutadiene*	3.9	6.2	NA	0.00098 U / 0.048 U	0.00097 U / 0.056 U	0.00099 U / 0.066U	0.00099 U / 0.052U	NA	NA	0.00098 U / 0.032 U	NA	0.00098 U / 0.043 U	0.00097 U / 0.192 U	0.00097 U / 0.087 U	NA	0.00099 U / 0.117 U
PCBs (mg/kg // mg/kgOC)																
Aroclor 1016	NE	NE	NA	0.012 U	0.227 U	0.026 U	0.0039 U	NA	NA	0.098 U	NA	0.020 U	0.020 U	0.0038 U	NA	0.0040 U
Aroclor 1221	NE	NE	NA	0.012 U	0.227 U	0.026 U	0.0039 U	NA	NA	0.098 U	NA	0.020 U	0.020 U	0.0038 U	NA	0.0040 U
Aroclor 1232	NE	NE	NA	0.012 U	0.227 U	0.026 U	0.0039 U	NA	NA	0.098 U	NA	0.020 U	0.020 U	0.0077 UJ	NA	0.0040 U
Aroclor 1242	NE	NE	NA	0.012 U	0.227 U	0.026 U	0.0039 U	NA	NA	0.098 U	NA	0.020 U	0.020 U	0.0038 U	NA	0.0040 U
Aroclor 1248	NE	NE	NA	0.012 U	0.227 U	0.026 U	0.0039 U	NA	NA	0.310	NA	0.020 U	0.020 U	0.0038 U	NA	0.0040 U
Aroclor 1254	NE	NE	NA	0.018	0.227 U	0.027	0.0039 U	NA	NA	0.150	NA	0.025	0.062	0.0038 U	NA	0.0040 U
Aroclor 1260	NE	NE	NA	0.013	0.227 U	0.026 U	0.0039 U	NA	NA	0.098 U	NA	0.042	0.073	0.0038 U	NA	0.0040 U
Total PCBs*	12	65	NA	0.031 / 1.5	0.0039 U / 0.23 U	0.027 / 1.8	0.0039 U / 0.20 U	NA	NA	**0.46 / 15**	NA	0.067 / 2.9	**0.14 / 27**	0.0077 UJ / 0.69 UJ	NA	0.0040 U / 0.47 U

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**SC-1-3**	**SC-1-5**	**SC-1-7**	**SC-2-2.5**	**SC-2-4**	**SC-3-1**	**SC-3-3**	**SC-3-5**	**SC-4-2**	**SC-4-4**	**SC-5-2**	**SC-5-4**	**SC-6-2**	**SC-6-3.5**
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	02/10/09 2-4 Feet	02/10/09 4-6 Feet	02/10/09 7-9 Feet	02/10/09 1.5-3.5 Feet	02/10/09 3.5-5.5 Feet	02/09/09 0-2 Feet	02/09/09 2-4 Feet	02/09/09 4-6 Feet	02/10/09 1.5-3.5 Feet	02/10/09 3.5-5.5 Feet	02/10/09 1-3 Feet	02/10/09 3-5 Feet	02/09/09 0.75-2.5 Feet	02/09/09 3.5-4.75 Feet
Organotins (ug/kg)																
Tributyltin as TBT Ion	NE	73	NA	3.5 U	3.2 U	3.6 U	3.5 U	NA	NA	3.5 U	NA	**100**	3.5 U	3.2 U	NA	3.3 U
Dibutyl Tin Ion	NE	NE	NA	5.3 U	4.8 U	5.3 U	5.2 U	NA	NA	5.3 U	NA	8.8	5.2 U	4.9 U	NA	4.9 U
Butyl Tin Ion	NE	NE	NA	3.7 U	3.4 U	3.8 U	3.7 U	NA	NA	3.7 U	NA	3.8 U	3.6 U	3.4 U	NA	3.5 U
Organotins-Porewater (ug/L)																
Tributyltin as TBT Ion	0.05	0.15	**0.23**	0.013	0.008 U	0.03	0.008 U	**0.27**	0.018	0.008 U	0.029	0.008 U	**0.25**	0.059 U	**0.18**	0.086 U
Dibutyl Tin Ion	NE	NE	0.049	0.012 U	0.012 U	0.013	0.012 U	0.025	0.012 U	0.012 U	0.012 U	0.012 U	0.027	0.089 U	0.02	0.13 U
Butyl Tin Ion	NE	NE	0.017	0.012 J	0.025	0.011	0.008 U	0.015	0.008 U	0.044	0.008 U	0.008 U	0.031	0.063 U	0.01	0.091 U
Petroleum Hydrocarbons (mg/kg)																
Gasoline Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																
Arsenic	57	93	NA	9	8 U	12	8 U	NA	NA	10 U	NA	12	6 U	8	NA	19
Cadmium	5.1	6.7	NA	0.8	0.4	0.8	0.3 U	NA	NA	1	NA	0.6	0.2 U	0.3	NA	0.2 U
Chromium	260	270	NA	60.3	50.3	61.4	40.7	NA	NA	64	NA	59.6	29.4	30.9	NA	27.7
Copper	390	390	NA	79.1	44.5	94.5	33.7	NA	NA	156	NA	72.6	16.7	16.8	NA	24.9
Lead	450	530	NA	46	11	24	7	NA	NA	112	NA	20	5	3	NA	4
Mercury	0.41	0.59	**0.54 J**	0.25 J	0.14	0.23 J	0.09	0.21 J	0.36 J	**0.42**	0.16 J	0.2	0.05	0.06 J	**0.75 J**	0.05 U
Nickel	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	6.1	6.1	NA	0.6	0.5 U	0.6	0.5 U	NA	NA	0.7	NA	0.6 U	0.4 U	0.4 U	NA	0.4 U
Zinc	410	960	NA	127	73	122	59	NA	NA	148	NA	101	42	38	NA	45
Ammonia (mg-N/kg)																
Ammonia	NE	NE	25.6	46.3	30.6	44.4	27.5	45	110	202	25.1	94.3	9.7	7.23	12.8	0.86
Total Sulfides (mg/kg)																
Total Sulfides	NE	NE	638	200	46.9 J	292	1.56 UJ	1,020	160	18,500 J	1,420	161 J	118 J	1.25 U	2,960	20.3 J
Acid Volatile Sulfides	NE	NE	612	1,450	10.1 J	448	7.93 J	751	1,930	2,550 J	889	355 J	39.3 J	2.5	4,570	2.59 J
Total Solids (%)																
Total Solids	NE	NE	56	58.2	60.4	54.8	65.4	51.4	50.6	45.5	54	51.8	76.4	76.8	48.8	77.8
Total Volatile Solids (mg/kg)	NE	NE	7	6.45	5.5	6.71	5.13	6.75	7.02	8.84	6.27	7.04	1.64	1.5	6.93	1.65
TOC (%)																
TOC	NE	NE	2.24	2.03	1.72	1.51	1.92	2.33	2.62	3.1	1.71	2.29	0.505	1.11	3.25	0.846

Notes:
Results exceeding Sediment Management Standard are **BOLD**
Highlighted results indicate reporting limit exceeds Sediment Management Standard
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
* The listed SQS value represents a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
cm - centimeters
LCS/LCSD - Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
NA - Not analyzed
NE - Not established
PCBs - Polychlorinated biphenyls
RPD - Relative percent difference
SRM - Standard reference material
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
VOCs - Volatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
ug/kgOC - micrograms per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		SG-01	SG-02	SG-03	SG-04	SG-05		SG-06	SG-07	SG-08	SG-09	SG-10	SG-11	SG-12	SG-13	SG-14
			02/11/09	02/11/09	02/13/09	02/13/09	02/12/09		02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/13/09
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	Field Duplicate 0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
VOCs (mg/kg // mg/kgOC)																	
1,2,4-Trichlorobenzene*	0.81	1.8	0.0064 U / 0.34 U	0.0070 U / 0.37 U	0.0072 U / 0.37 U	0.0078 U / 0.39 U	0.0071 U / 0.39 U	0.0076 U / 0.42 U	0.0071 UJ / 0.39 UJ	0.0072 U / 0.37 U	0.0076 U / 0.40 U	0.0069 U / 0.33 U	0.0071 U / 0.51 U	0.0068 U / 0.40 U	0.0068 U / 0.47 U	0.0066 U / 0.45 U	0.0080 U / 0.36 U
1,2-Dichlorobenzene*	2.3	2.3	0.0013 U / 0.069 U	0.0014 U / 0.073 U	0.0014 U / 0.071 U	0.0016 U / 0.080 U	0.0014 U / 0.077 U	0.0015 U / 0.082 U	0.0014 UJ / 0.076 UJ	0.0014 U / 0.071 U	0.0015 U / 0.079 U	0.0014 U / 0.067 U	0.0014 U / 0.10 U	0.0014 U / 0.081 U	0.0014 U / 0.097 U	0.0013 U / 0.089 U	0.0016 U / 0.073 U
1,4-Dichlorobenzene*	3.1	9.0	0.0013 U / 0.069 U	0.0014 U / 0.073 U	0.0014 U / 0.071 U	0.0016 U / 0.080 U	0.0014 U / 0.077 U	0.0015 U / 0.082 U	0.0014 UJ / 0.076 UJ	0.0014 U / 0.071 U	0.0015 U / 0.079 U	0.0014 U / 0.067 U	0.0014 U / 0.10 U	0.0014 U / 0.081 U	0.0014 U / 0.097 U	0.0013 U / 0.089 U	0.0016 U / 0.073 U
SVOCs (ug/kg)																	
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	98 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	98 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	90	20 U	20 U	98 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzoic Acid	650	650	200 U	200 U	200 U	980 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Benzyl Alcohol	57	73	**240**	20 U	20 U	98 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	98 U	99 U	98 U	490 U	98 U	100 U	98 U	98 U	98 U	99 U	98 U	99 U	100 U	98 U	100 U
Phenol	420	1,200	63	22	20 U	98 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
SVOCs (mg/kg // mg/kgOC)																	
2-Methylnapthalene*	38	64	0.035 / 1.9	0.0048 / 0.25	0.020 U / 1.0 U	0.57 / 28	0.0048 / 0.26	0.0062 / 0.34	0.0050 U / 0.27 U	0.0065 / 0.33	0.0058 / 0.31	0.013 / 0.62	0.0097 / 0.69	0.0081 / 0.47	0.026 / 1.8	0.020 U / 1.4 U	0.020 U / 0.91 U
Acenaphthene*	16	57	0.082 / 4.3	0.0048 / 0.25	0.021 / 1.1	**4.0 / 200**	0.0062 / 0.34	0.0072 / 0.39	0.0064 / 0.35	0.0094 / 0.48	0.0067 / 0.35	0.12 / 5.7	0.087 / 6.2	0.019 / 1.1	0.11 / 7.6	0.23 / 16	0.22 / 10
Acenaphthylene*	66	66	0.20 / 11	0.023 / 1.2	0.025 / 1.3	0.86 / 43	0.010 / 0.55	0.011 / 0.60	0.012 / 0.65	0.017 / 0.87	0.012 / 0.64	0.054 / 2.6	0.025 / 1.8	0.052 / 3.0	0.036 / 2.5	0.11 / 7.5	0.028 / 1.3
Anthracene*	220	1,200	0.94 / 50	0.067 / 3.5	0.13 / 6.6	4.1 / 200	0.077 / 4.2	0.062 / 3.4	0.073 / 4.0	0.090 / 4.6	0.065 / 3.4	0.26 / 12	0.080 / 5.7	0.081 / 4.7	0.14 / 9.7	0.39 / 27	0.11 / 5.0
Benz[a]anthracene*	110	270	1.8 / 95	0.24 / 13	0.60 / 31	**8.6 / 430**	0.21 / 12	0.200 / 11	0.39 J / 21 J	0.50 / 26	0.20 / 11	0.93 / 44	0.25 / 18	0.37 / 22	0.36 / 25	1.7 / 120	0.78 / 36
Benzo[a]pyrene*	99	210	1.3 / 69	0.15 / 7.9	0.40 / 20	**2.9 / 140**	0.16 / 8.8	0.160 / 8.7	0.25 / 14	0.26 / 13	0.15 / 7.9	0.66 / 31	0.17 / 12	0.25 / 15	0.23 / 16	0.64 / 44	0.40 / 18
Benzo(b)fluoranthene	NE	NE	2.2 / 120	0.30 / 16	0.56 / 29	10 / 500	0.27 / 15	0.26 / 14	0.34 / 18	0.38 / 19	0.24 / 13	0.86 / 41	0.33 / 24	0.38 / 22	0.32 / 22	1.3 / 89	0.65 / 30
Benzo[g,h,i]perylene*	31	78	0.53 / 28	0.045 / 2.4	0.22 / 11	**1.0 / 50**	0.074 / 4.1	0.079 / 4.3	0.10 / 5.4	0.10 / 5.1	0.068 / 3.6	0.28 / 13	0.082 / 5.9	0.13 / 7.6	0.12 / 8.3	0.35 / 24	0.19 / 8.7
Benzo(k)fluoranthene	NE	NE	1.6 / 85	0.21 / 11	0.56 / 29	8.6 / 430	0.19 / 10	0.18 / 9.8	0.28 J / 15 J	0.31 / 16	0.17 / 9.0	0.86 / 41	0.24 / 17	0.38 / 22	0.32 / 22	1.3 / 89	0.65 / 30
Bis[2-ethylhexyl]phthalate*	47	78	**1.5 / 79**	0.12 / 6.3	0.17 /8.7	0.17 / 8.5	0.031 / 1.7	0.049 / 2.7	0.022 / 1.2	0.055 / 2.8	0.052 / 2.8	0.099 / 4.7	0.064 / 4.6	0.15 / 8.7	0.083 / 5.7	**4.1 / 280**	0.18 / 8.2
Butyl Benzyl Phthalate*	4.9	64	0.067 / 3.5	0.020 U / 1.0 U	0.020 U / 1.0 U	0.098 U / 4.9 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.02 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.020 U / 1.4 U	0.020 U / 0.91 U
Chrysene*	110	460	**3.4 / 180**	0.38 / 20	1.1 / 56	**30 / 1,500**	0.400 / 22	0.40 / 22	0.57 / 31	0.63 / 32.	0.38 / 20.	1.9 / 90	0.54 / 39	0.72 / 412	0.63 / 43	**3.0 / 205**	1.2 / 55
Dibenz[a,h]anthracene*	12	33	0.22 / 12	0.021 / 1.1	0.10 /5.1	**0.47 / 24**	0.035 / 1.9	0.028 / 1.5	0.055 / 3.0	0.055 / 2.8	0.025 / 1.3	0.15 / 7.1	0.041 / 2.9	0.055 / 3.2	0.055 / 3.8	0.14 / 9.6	0.088 / 4.0
Dibenzofuran*	15	58	0.070 / 3.7	0.048 / 0.25	0.020 U / 1.0 U	**4.9 / 240**	0.0090 / 0.50	0.0096 / 0.52	0.0079 / 0.43	0.012 / 0.61	0.0082 / 0.43	0.046 / 2.2	0.019 / 1.4	0.014 / 0.81	0.060 / 4.1	0.092 / 6.3	0.020 U / 0.91 U
Diethyl Phthalate*	61	110	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.0 U	0.098 U / 4.9 U	0.024 / 1.3	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.020 U / 1.4 U	0.020 U / 0.91 U
Dimethyl Phthalate*	53	53	0.079 / 4.2	0.020 U / 1.7 U	0.062 / 3.1	0.098 U / 4.9 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.030 / 2.1	0.037 / 1.7
Di-n-butyl Phthalate*	220	1,700	0.023 / 1.2	0.020 U / 1.0 U	0.020 U / 1.0 U	0.098 U / 4.9 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.021 / 1.4	0.020 U / 0.91 U
Di-n-octyl Phthalate*	58	4,500	0.040 / 2.1	0.020 U / 1.0 U	0.020 U / 1.0 U	0.098 U / 4.9 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.020 U / 1.37 U	0.020 U / 0.91 U
Fluoranthene*	160	1,200	**5.0 / 260**	0.61 / 32	1.6 / 82	**120 / 6,000**	0.29 / 16	0.350 / 19	0.50 / 27	0.70 / 36	0.41 / 22	**3.4 / 160**	1.1 / 79	1.4 / 81	1.1 / 76	**14 / 960**	3.4 / 160
Fluorene*	23	79	0.16 / 8.5	0.0091 / 0.48	0.047 / 2.4	**8.9 / 440**	0.021 / 1.2	0.018 / 0.98	0.017 / 0.92	0.022 / 1.1	0.017 / 0.90	0.10 / 4.8	0.036 / 2.6	0.031 / 1.8	0.12 / 8.3	0.25 / 17	0.074 / 3.4
Indeno[1,2,3-cd]pyrene*	34	88	0.55 / 29	0.046 / 2.4	0.17 / 8.7	**1.3 / 65**	0.062 / 3.4	0.067 / 3.7	0.088 / 4.8	0.092 / 4.7	0.055 / 2.9	0.26 / 12	0.073 / 5.2	0.11 / 6.4	0.099 / 6.8	0.31 / 21	0.15 / 6.8
Napthalene*	99	170	0.096 U / 5.1 U	0.0058 / 0.30	0.020 U / 1.0 U	0.49 / 24	0.010 / 0.55	0.011 / 0.60	0.0074 / 0.40	0.011 / 0.56	0.0096 / 0.51	0.024 / 1.1	0.016 / 1.1	0.017 / 0.99	0.058 / 4.0	0.020 U / 1.4 U	0.020 U / 0.91 U
N-nitrosodiphenylamine*	11	11	0.020 U / 1.1 U	0.020 U / 1.05 U	0.020 U / 1.0 U	0.14 / 7.0	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.1 U	0.020 U / 1.0 U	0.020 U / 1.1 U	0.020 U / 0.95 U	0.020 U / 1.4 U	0.020 U / 1.2 U	0.020 U / 1.4 U	0.020 U / 1.4 U	0.020 U / 0.91 U
Phenanthrene*	100	480	1.2 / 63	0.11 / 5.8	0.48 / 24	**110 / 5,500**	0.098 / 5.4	0.10 / 5.5	0.12 / 6.5	0.10 / 5.1	0.090 / 4.8	0.57 / 27	0.27 / 19	0.28 / 169	0.35 / 24	**5.0 / 342**	0.41 / 19
Pyrene*	1,000	1,400	4.3 / 230	0.48 / 25	1.6 / 82	**77 / 3,800**	0.320 / 18	0.42 / 23	0.44 / 24	0.75 / 38	0.42 / 22	3.7 / 180	1.0 / 71	1.2 / 70	1.3 / 90	8.9 / 610	2.8 / 130
Total LPAH*	370	780	2.6 / 140	0.22 / 12	0.70 / 36	**130 / 6,400**	0.22 / 12	0.21 / 11	0.24 / 13	0.25 / 13	0.20 / 11	1.1 / 54	0.51 / 37	0.48 / 28	0.81 / 56	**5.98 / 410**	0.84 / 38
Total HPAH*	960	5,300	**22 / 1,100**	2.5 / 130	6.9 / 350	**260 / 13,000**	2.0 / 110	2.1 / 120	3.0 J / 160 J	3.8 / 190	2.1 / 110	13 / 620	3.8 / 270	5.1 / 290	4.5 / 313	**32 / 2,200**	10 / 470
Total Benzofluoranthenes*	230**	450**	3.8 / 200	0.51 / 27	1.1 / 57	**19 / 930**	0.46 / 25	0.44 / 24	0.62 / 34	0.69 / 35	0.41 / 22	1.7 / 82	0.57 / 41	0.76 / 44	0.64 / 44	2.6 / 180	1.3 / 59
Pesticides (mg/kg // mg/kgOC)																	
Hexachlorobenzene*	0.38	2.3	0.00098 U / 0.052 U	0.00099 U / 0.052 U	0.00097 U / 0.049 U	0.00098 U / 0.049 U	0.00097 U / 0.053 U	0.00097 U / 0.053 U	0.00098 U / 0.053 U	0.00098 U / 0.050 U	0.00099 U / 0.052 U	0.00098 U / 0.047 U	0.00098 U / 0.070 U	0.00098 U / 0.057 U	0.0010 U / 0.069 U	0.00096 U / 0.066 U	0.0010 U / 0.046 U
Hexachlorobutadiene*	3.9	6.2	0.00098 U / 0.052 U	0.00099 U / 0.052 U	0.00097 U / 0.049 U	0.00098 U / 0.049 U	0.00097 U / 0.053 U	0.00097 U / 0.053 U	0.00098 U / 0.053 U	0.00098 U / 0.050 U	0.00099 U / 0.052 U	0.00098 U / 0.047 U	0.00098 U / 0.070 U	0.00098 U / 0.057 U	0.0010 U / 0.069 U	0.00096 U / 0.066 U	0.0010 U / 0.046 U
PCBs (mg/kg // mg/kgOC)																	
Aroclor 1016	NE	NE	0.012 UJ	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0040 U
Aroclor 1221	NE	NE	0.012 UJ	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0060 UJ	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0040 U
Aroclor 1232	NE	NE	0.012 UJ	0.0040 U	0.0039 U	0.0040 U	0.0058 UJ	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0059 UJ	0.0040 U	0.012 UJ	0.0040 U
Aroclor 1242	NE	NE	0.012 UJ	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	0.0040 U
Aroclor 1248	NE	NE	0.012 UJ	0.0040 U	0.0097 UJ	0.0040 U	0.0039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.037	0.0039 U	0.0039 U	0.0096	0.0039 U	0.0099 UJ
Aroclor 1254	NE	NE	0.028 J	0.0066	0.037	0.0040 U	0.0088	0.0060 J	0.0039 U	0.0039 U	0.0039 U	0.037	0.0072	0.0082	0.010	0.016	0.027
Aroclor 1260	NE	NE	0.012 UJ	0.0040 U	0.0077 UJ	0.0040 U	0.0039 U	0.007	0.0039 U	0.0039 U	0.0039 U	0.0069	0.0039 U	0.0039 U	0.0040 U	0.013 J	0.011
Total PCBs*	12	65	0.028 J / 1.5 J	0.0066 / 0.34	0.037 / 1.9	0.0040 U / 0.20 U	0.0088 / 0.48	0.013 J / 0.71 J	0.0039 U / 0.21 U	0.0039 U / 0.20 U	0.0039 U / 0.21 U	0.081 / 3.9	0.0072 / 0.51	0.0082 / 0.48	0.020 / 1.4	0.029 J / 2.0 J	0.038 / 1.7

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**SG-01**	**SG-02**	**SG-03**	**SG-04**	**SG-05**		**SG-06**	**SG-07**	**SG-08**	**SG-09**	**SG-10**	**SG-11**	**SG-12**	**SG-13**	**SG-14**
			02/11/09	02/11/09	02/13/09	02/13/09	02/12/09		02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/12/09	02/13/09
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	Field Duplicate 0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NE	73	**1,500**	40	**160**	6.2	21	24	10	16	7	**2,800**	30	17	9.5	49	**490**
Dibutyl Tin Ion	NE	NE	530	28	56	5.3 U	31 J	14 J	5.6 U	19	5.2 U	820	12	5.8	5.4 U	14	110
Butyl Tin Ion	NE	NE	65	5.2	13	3.7 U	5.7	3.9 U	4.0 U	4.8	3.7 U	76 U	3.5 U	3.5 U	3.8 U	3.5 U	15
Organotins-Porewater (ug/L)																	
Tributyltin as TBT Ion	0.05	0.15	**0.51**	0.028	0.008 U	0.008 U	0.009	0.008	0.011	0.01	0.042	**0.55**	0.008 U	0.008 U	0.008 U	0.014	0.030 J
Dibutyl Tin Ion	NE	NE	0.1	0.016	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.027	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Butyl Tin Ion	NE	NE	0.025	0.016	0.008 U	0.008 U	0.008 U	0.008	0.009	0.008 U	0.068	0.014	0.016	0.008 U	0.008 U	0.008 U	0.008 U
Petroleum Hydrocarbons (mg/kg)																	
Gasoline Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Arsenic	57	93	**70**	14	10	9 U	11	10	10 U	9 U	9 U	12	9 U	9 U	9 U	11	10 U
Cadmium	5.1	6.7	0.6	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4 U	0.3 U	0.6
Chromium	260	270	78	61	57.1	57.9	54.5	58.1	58	55.5	55.1	41.9	47.7	51.3	35.6	40.4	60
Copper	390	390	**929**	107	178	78.9	127 J	115 J	100 J	107 J	114 J	**972 J**	68.9 J	68.6 J	46.3 J	68.6 J	139
Lead	450	530	**702**	20	22	12	13	13	13	12	12	41	11	12	18	19	25
Mercury	0.41	0.59	**0.7**	0.15	0.24	0.12	0.14	0.13	0.12	0.13	0.13	0.34	0.13	0.11	0.13	0.1	0.23
Nickel	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	6.1	6.1	0.6 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U
Zinc	410	960	**757**	143	171	121	125	132	115	123	119	190	106	112	89	131	156
Ammonia (mg-N/kg)																	
Ammonia	NE	NE	5.77	8.38	12.5	6.37	15.7 J	15.4 J	9.11 J	7.66 J	7.23 J	5.26 J	5.25 J	5.07 J	4.08 J	6.16 J	5.03
Total Sulfides (mg/kg)																	
Total Sulfides	NE	NE	1,600	150	951	1,360	621 J	1,120 J	592 J	1,020 J	402 J	1,660 J	319 J	1,230 J	768 J	901 J	1,560
Acid Volatile Sulfides	NE	NE	1,100 J	684 J	1,410	704	345 J	1,620 J	2,020	2,250	1,530	2,450	788	1,020	1,290	1,170	2,470
Total Solids (%)																	
Total Solids	NE	NE	50.4	50.5	51.9	48.6	51.4	53.6	49.6	51	48.8	49.2	52.4	52.4	54.1	57.3	45.6
Total Volatile Solids (mg/kg)	NE	NE	6.48	6.66	6.16	6.42	6.54	6.28	6.18	6.32	6.47	5.97	5.24	5.49	5.39	4.87	6.63
TOC (%)																	
TOC	NE	NE	1.89	1.91	1.96	2	1.82	1.83	1.84	1.96	1.89	2.1	1.4	1.72	1.45	1.46	2.19

Notes:
Results exceeding Sediment Management Standard are **BOLD**
Highlighted results indicate reporting limit exceeds Sediment Management Standard
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
* The listed SQS value represents a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
cm - centimeters
LCS/LCSD - Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
NA - Not analyzed
NE - Not established
PCBs - Polychlorinated biphenyls
RPD - Relative percent difference
SRM - Standard reference material
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
VOCs - Volatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
ug/kgOC - micrograms per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**SG-15**	**SG-16**	**SG-17**	**SG-18**	**SG-19**	**SG-20**		**SG-21**	**SG-22**	**SG-23**	**SG-24**	**SG-25**	**SG-26**	**SG-27**	**SG-28**	**SG-29**		**SG-30**
			02/11/09	02/11/09	02/13/09	02/12/09	02/12/09	02/11/09		02/11/09	02/11/09	02/11/09	02/11/09	02/11/09	02/11/09	02/11/09	10/08/2009	10/08/2009		10/08/2009
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	Field Duplicate 0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	Field Duplicate 0-10 cm	0-10 cm
VOCs (mg/kg // mg/kgOC)																				
1,2,4-Trichlorobenzene*	0.81	1.8	0.0078 U / 0.39 U	0.0076 U / 0.34 U	0.0074 U / 0.32 U	0.0068 U / 0.36 U	0.0072 U / 0.34 U	0.0072 U / 0.44 U	0.0074 U / 0.46 U	0.0068 U / 0.30 U	0.071 UJ / 0.32 UJ	0.0074 U / 0.37 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1.0 U
1,2-Dichlorobenzene*	2.3	2.3	0.0016 U / 0.080 U	0.0015 U / 0.068 U	0.0015 U / 0.066 U	0.0014 U / 0.073 U	0.0014 U / 0.067 U	0.0014 U / 0.086 U	0.0015 U / 0.093 U	0.0014 U / 0.063 U	0.0014 UJ / 0.063 UJ	0.0015 U / 0.075 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1.0 U
1,4-Dichlorobenzene*	3.1	9.0	0.0016 U / 0.080 U	0.0015 U / 0.068 U	0.0015 U / 0.066 U	0.0014 U / 0.073 U	0.0014 U / 0.067 U	0.0014 U / 0.086 U	0.0015 U / 0.093 U	0.0014 U / 0.063 U	0.0014 UJ / 0.063 UJ	0.0015 U / 0.075 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
SVOCs (ug/kg)																				
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U	20 U	19 U	20 U	20 U	20 U	20 U	NA	NA	NA	NA	59 U	20 U	20 U	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	20 U	20 U	19 U	20 U	20 U	20 U	20 U	NA	NA	NA	NA	59 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	39 J	20 U	20 U	20 U	19 U	20 U	20 U	42	20 U	NA	NA	NA	NA	59 U	20 U	20 U	20 U
Benzoic Acid	650	650	200 U	200 U	200 U	200 U	200 U	190 U	200 U	200 U	200 U	200 U	NA	NA	NA	NA	590 U	200 U	200 U	200 U
Benzyl Alcohol	57	73	20 U	**13,000 J**	20 U	20 U	20 U	19 U	20 U	20 U	20 U	**59 J**	NA	NA	NA	NA	59 U	20 U	69 J	20 U
Pentachlorophenol	360	690	98 U	98 U	98 U	99 U	98 U	97 U	98 U	98 U	98 U	98 U	NA	NA	NA	NA	290 U	98 U	99 U	99 U
Phenol	420	1,200	20 U	29 J	20 U	20 U	20 U	19 U	20 U	20 U	160	20 U	NA	NA	NA	NA	59 U	20 U	65	16 J
SVOCs (mg/kg // mg/kgOC)																				
2-Methylnapthalene*	38	64	0.014 / 0.70	0.0058 / 0.26	0.020 U / 0.87 U	0.0047 U / 0.25 U	0.0048 U/ 0.23 U	0.0048 U/ 0.30 U	0.0048 U/ 0.30 U	0.0048 U/ 0.22 U	0.020 U / 0.90 U	0.0048 U / 0.24 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Acenaphthene*	16	57	0.034 J / 1.7 J	0.034 J / 1.5 J	**0.42 / 18**	0.0047 U / 0.25 U	0.0048 U/ 0.23 U	0.0048 U/ 0.30 U	0.0048 U/ 0.30 U	0.0048 / 0.22	0.020 U / 0.90 U	0.088 J / 4.4 J	NA	NA	NA	NA	0.032 J / 1.7 J	0.01 J / 0.54 J	0.02 U / 1.1 U	0.013 J / 0.65 J
Acenaphthylene*	66	66	0.049 J / 2.5 J	0.11 J / 5.0 J	0.020 U / 0.87 U	0.0047 U / 0.25 U	0.0048 U/ 0.23 U	0.0048 U/ 0.30 U	0.0048 U/ 0.30 U	0.0048 U/ 0.22 U	0.020 U / 0.90 U	0.044 J / 2.2 J	NA	NA	NA	NA	0.037 J / 2 J	0.013 J / 0.71 J	0.014 J / 0.75 J	0.018 J / 0.9 J
Anthracene*	220	1,200	0.22 J/ 11 J	0.40 J / 18 J	0.15 / 6.6	0.012 / 0.63	0.021 / 1.0	0.024 / 1.5	0.028 / 1.74	0.026 / 1.2	0.021 J / 0.95 J	0.16 J / 8.0 J	NA	NA	NA	NA	0.38 / 20	0.052 / 2.8	0.045 / 2.4	0.063 / 3.2
Benz[a]anthracene*	110	270	0.77 J / 39 J	1.4 J/ 63 J	0.87 / 38	0.048 / 2.5	0.068 / 3.2	0.057 / 3.5	0.060 / 3.7	0.067 / 3.0	0.045 J / 2.0 J	0.47 J / 24 J	NA	NA	NA	NA	0.89 J / 48 J	0.14 J / 7.6 J	0.14 / 7.5	0.18 J / 9 J
Benzo[a]pyrene*	99	210	0.48 J / 24 J	1.2 J / 54 J	0.48 / 21	0.034 / 1.8	0.049 / 2.3	0.038 / 2.3	0.040 / 2.5	0.048 / 2.2	0.035 / 1.6	0.32 J / 160 J	NA	NA	NA	NA	0.5 / 27	0.14 J / 7.6 J	0.12 / 6.4	0.24 J / 12.1 J
Benzo(b)fluoranthene	NE	NE	0.94 J / 47	1.9 J / 86	0.65 / 28	0.062 / 3.2	0.086 / 4.1	0.071 / 4.4	0.073 / 4.5	0.082 / 3.7	0.062 / 2.8	0.59 J / 30	NA	NA	NA	NA	0.69 / 37	0.16 / 8.7	0.13 / 7.0	0.23 / 12
Benzo[g,h,i]perylene*	31	78	0.26 / 13	0.51 J / 23 J	0.23 / 10	0.021 / 1.1	0.027 / 1.3	0.016 / 0.99	0.017 / 1.1	0.023 / 1.0	0.018 / 0.81	0.14 J / 7.0 J	NA	NA	NA	NA	0.12 / 6.5	0.041 / 2.2	0.056 / 3	0.082 / 4.1
Benzo(k)fluoranthene	NE	NE	0.65 J / 33	1.4 J / 63	0.65 / 28	0.046 / 2.4	0.068 / 3.2	0.048 / 3.0	0.049 / 3.0	0.064 / 2.9	0.045 / 2.0	0.65 J / 33	NA	NA	NA	NA	0.69 / 37	0.16 / 8.7	0.13 / 7.0	0.23 / 12
Bis[2-ethylhexyl]phthalate*	47	78	0.38 J / 19 J	**2.7 J / 120 J**	0.76 / 33	0.026 / 1.4	0.040 / 1.9	0.064 / 4.0	0.050 / 3.1	0.073 / 3.3	0.042 J / 1.9 J	0.69 J / 35 J	NA	NA	NA	NA	0.56 / 30	0.2 / 10.9	0.12 / 6.4	0.46 / 23.1
Butyl Benzyl Phthalate*	4.9	64	0.059 U / 3.0 U	0.062 J / 2.8 J	0.030 / 1.3	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.040 J / 2.0 J	NA	NA	NA	NA	0.059 U / 3.2 U	0.021 / 1.1	0.02 U / 1.1 U	0.02 U / 1 U
Chrysene*	110	460	1.4 J / 70 J	2.2 J / 100 J	0.98 / 43	0.082 / 4.3	0.12 / 5.7	0.11 / 6.8	0.13 / 8.1	0.11 / 4.9	0.074 / 3.3	0.84 J / 421 J	NA	NA	NA	NA	1.9 J / 100 J	0.26 J / 14.1 J	0.27 / 14.4	0.53 J / 26.6 J
Dibenz[a,h]anthracene*	12	33	0.070 / 3.5	0.11 / 5.0	0.11 / 4.8	0.0079 / 0.41	0.012 / 0.57	0.0068 / 0.42	0.0082 / 0.51	0.0096 / 0.43	0.0082 / 0.37	0.033 / 1.7	NA	NA	NA	NA	0.081 / 4.4	0.017 J / 0.92 J	0.03 / 1.6	0.025 / 1.3
Dibenzofuran*	15	58	0.024 J / 1.2 J	0.039 J / 1.8 J	0.020 U / 0.87 U	0.0047 U / 0.25 U	0.0048 / 0.23	0.0048 U/ 0.30 U	0.0048 U/ 0.30 U	0.0053 / 0.24	0.0048 U / 0.22 U	0.028 J / 1.407 J	NA	NA	NA	NA	0.038 J / 2.1 J	0.011 J / 0.6 J	0.02 U / 1.1 U	0.014 J / 0.7 J
Diethyl Phthalate*	61	110	0.059 U / 3.0 U	0.020 U / 0.90 U	0.024 / 1.0	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.020 U / 1.0 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Dimethyl Phthalate*	53	53	0.038 J / 1.9 J	0.15 J / 6.8 J	0.080 / 3.5	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.14 J / 7.0 J	NA	NA	NA	NA	0.090 / 4.9	0.043 / 2.3	0.04 / 2.1	0.05 / 2.5
Di-n-butyl Phthalate*	220	1,700	0.059 U / 3.0 U	0.068 J / 3.1 J	0.020 U / 0.87 U	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.021 J / 1.1 J	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Di-n-octyl Phthalate*	58	4,500	0.059 U / 3.0 U	0.047 J / 2.1 J	0.020 U / 0.87 U	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.020 J / 1.0 J	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Fluoranthene*	160	1,200	1.6 J / 80 J	1.8 J / 81 J	2.7 / 118	0.12 / 6.3	0.23 / 10.95	0.13 / 8.0	0.13 / 8.1	0.16 / 7.2	0.12 / 5.4	1.5 J / 75 J	NA	NA	NA	NA	1.4 / 76	0.52 / 28.3	0.43 / 23	1.4 J / 70.4 J
Fluorene*	23	79	0.068 J / 3.4 J	0.086 J / 3.9 J	0.066 / 2.9	0.0056 / 0.29	0.0067 / 0.32	0.0053 / 0.33	0.0058 / 0.36	0.0062 / 0.28	0.0053 / 0.24	0.056 J / 2.8 J	NA	NA	NA	NA	0.095 / 5.1	0.016 J / 0.87 J	0.016 J / 0.86 J	0.02 / 1
Indeno[1,2,3-cd]pyrene*	34	88	0.25 / 13	0.53 J / 24 J	0.20 / 8.7	0.016 / 0.84	0.022 / 1.0	0.016 / 0.99	0.0016 / 0.99	0.022 / 0.99	0.015 / 0.68	0.14 J / 7.0 J	NA	NA	NA	NA	0.16 / 8.6	0.058 / 3.2	0.056 / 3	0.11 / 5.5
Napthalene*	99	170	0.0090 / 0.45	0.031 J / 1.4 J	0.020 U / 0.87 U	0.0047 U / 0.25 U	0.0048 U/ 0.23 U	0.0048 / 0.30	0.0048 / 0.30	0.0058 / 0.26	0.0058 / 0.26	0.030 J/ 1.5 J	NA	NA	NA	NA	0.036 J / 1.9 J	0.016 J / 0.87 J	0.02 U / 1.1 U	0.015 J / 0.75 J
N-nitrosodiphenylamine*	11	11	0.059 U / 3.0 U	0.020 U / 0.90 U	0.020 U / 0.87 U	0.020 U / 1.0 U	0.020 U / 0.95 U	0.019 U / 1.2 U	0.020 U / 1.2 U	0.020 U / 0.90 U	0.020 U / 0.90 U	0.020 U / 1.0 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Phenanthrene*	100	480	0.46 J / 23 J	0.39 J / 18 J	0.24 / 10	0.031 / 1.6	0.16 / 7.6	0.036 / 2.2	0.038 / 2.4	0.039 / 1.7	0.028 / 1.3	0.24 J / 12 J	NA	NA	NA	NA	0.49 / 26	0.083 / 4.5	0.1 / 5.3	0.11 / 5.5
Pyrene*	1,000	1,400	1.1 J / 55 J	2.9 J / 130 J	2.0 / 87	0.13 / 6.8	0.18 / 8.6	0.14 / 8.6	0.14 / 8.7	0.16 / 7.2	0.11 / 5.0	1.2 J / 60 J	NA	NA	NA	NA	0.99 / 54	0.39 / 21.2	0.33 / 17.6	0.61 J / 30.7 J
Total LPAH*	370	780	0.84 J / 42 J	1.1 J / 48 J	0.88 / 38	0.049 / 2.5	0.19 / 9.2	0.070 / 4.3	0.077 / 4.8	0.082 / 3.7	0.060 J / 2.7 J	0.62 J / 31 J	NA	NA	NA	NA	6.7 / 36	1.73 / 94	0.18 / 9	3.41 / 171
Total HPAH*	960	5,300	7.5 J / 380 J	14 J / 630 J	8.9 / 390	0.57 / 30	0.86 / 41	0.63 / 39	0.66 / 41	0.75 / 33	0.53 J / 24 J	5.9 J / 300 J	NA	NA	NA	NA	0.69 / 37	0.16 / 8.7	1.69 / 90	0.23 / 11.6
Total Benzofluoranthenes*	230**	450**	1.6 / 80	3.3 / 150	1.3 / 57	0.11 / 5.6	0.15 / 7.3	0.12 / 7.3	0.12 7.6	0.15 / 6.5	0.11 / 4.8	1.2 / 62	NA	NA	NA	NA	1.4 / 75	0.32 / 17	0.26 / 14	0.46 / 23
Pesticides (mg/kg // mg/kgOC)																				
Hexachlorobenzene*	0.38	2.3	0.00098 U / 0.049 U	0.0010 UJ / 0.045 UJ	0.00097 U / 0.042 U	0.00098 U / 0.051 U	0.00097 U / 0.046 U	0.00099 U / 0.061 U	0.00098 U / 0.061 U	0.00097 U / 0.043 U	0.00099 U / 0.045 U	0.00098 U / 0.049 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
Hexachlorobutadiene*	3.9	6.2	0.00098 U / 0.049 U	0.00098 U / 0.044 U	0.00097 U / 0.042 U	0.00098 U / 0.051 U	0.00097 U / 0.046 U	0.00099 U / 0.061 U	0.00098 U / 0.061 U	0.00097 U / 0.043 U	0.00099 U / 0.045 U	0.00098 U / 0.049 U	NA	NA	NA	NA	0.059 U / 3.2 U	0.02 U / 1.1 U	0.02 U / 1.1 U	0.02 U / 1 U
PCBs (mg/kg // mg/kgOC)																				
Aroclor 1016	NE	NE	0.0039 U	0.0039 U	0.039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NE	NE	0.0039 U	0.0039 U	0.039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NE	NE	0.0039 U	0.0039 U	0.039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NE	NE	0.0039 U	0.0039 U	0.080	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NE	NE	0.0039 U	0.012 UJ	0.039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NE	NE	0.0065	0.038	0.100	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0059	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NE	NE	0.0039 U	0.0081 J	0.039 U	0.0040 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0040 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs*	12	65	0.0065 / 0.33	0.046 J / 2.1 J	0.18 / 7.9	0.0040 U / 0.21 U	0.0039 U / 0.19 U	0.0039 U / 0.24 U	0.0039 U / 0.24 U	0.0039 U / 0.18 U	0.0040 U / 0.18 U	0.0059 / 0.30	NA	NA	NA	NA	NA	NA	NA	NA

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a] Sediment Quality Standard (SQS)	Sediment Management Standards [a] Cleanup Screening Level (CSLs)	**SG-15** 02/11/09 0-10 cm	**SG-16** 02/11/09 0-10 cm	**SG-17** 02/13/09 0-10 cm	**SG-18** 02/12/09 0-10 cm	**SG-19** 02/12/09 0-10 cm	**SG-20** 02/11/09 0-10 cm	**SG-20** 02/11/09 Field Duplicate 0-10 cm	**SG-21** 02/11/09 0-10 cm	**SG-22** 02/11/09 0-10 cm	**SG-23** 02/11/09 0-10 cm	**SG-24** 02/11/09 0-10 cm	**SG-25** 02/11/09 0-10 cm	**SG-26** 02/11/09 0-10 cm	**SG-27** 02/11/09 0-10 cm	**SG-28** 10/08/2009 0-10 cm	**SG-29** 10/08/2009 0-10 cm	**SG-29** 10/08/2009 Field Duplicate 0-10 cm	**SG-30** 10/08/2009 0-10 cm
Organotins (ug/kg)																				
Tributyltin as TBT Ion	NE	73	**190**	**3,000**	**3,300**	3.6	6.2	8.8	13	14	22	**300**	NA	NA	NA	NA	39	22	30 J	11 J
Dibutyl Tin Ion	NE	NE	68	1000	900	5.2 U	5.0 U	5.5 U	5.6	5.6 U	12	80	NA	NA	NA	NA	21	7.9 J	15 J	6.5
Butyl Tin Ion	NE	NE	13	120	85	3.7 U	3.5 U	3.9 U	3.9 U	4.0 U	4.8	12	NA	NA	NA	NA	6.2	3.8 U	4 U	3.8 U
Organotins-Porewater (ug/L)																				
Tributyltin as TBT Ion	0.05	0.15	**0.32**	**2.2**	**0.27 J**	0.008 U	0.011	0.009	0.011	0.013	0.01	**0.2**	0.008 U	0.008 U	0.016	0.012	0.016	0.019	0.008 UJ	0.03
Dibutyl Tin Ion	NE	NE	0.048	0.2	0.016	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.027	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.016	0.012 UJ	0.013
Butyl Tin Ion	NE	NE	0.019	0.038	0.012	0.008 U	0.008 U	0.01	0.008 U	0.008 U	0.016 J	0.016	0.008	0.012	0.01	0.008	0.014	0.011	0.008 UJ	0.01 J
Petroleum Hydrocarbons (mg/kg)																				
Gasoline Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																				
Arsenic	57	93	10	20	9 U	9 U	9 U	11	10 U	12	13	10	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	5.1	6.7	0.4 U	0.9	0.7	0.5	0.4	0.4	0.4	0.5	0.4	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	260	270	51	76	47.8	55	57.9	58.4	52	59.4	58.4	57	NA	NA	NA	NA	NA	NA	NA	NA
Copper	390	390	126	**1,040**	**616**	70.5 J	78.9 J	78.6	75.1	91.7	83.9	106	NA	NA	NA	NA	NA	NA	NA	NA
Lead	450	530	19	49	26	11	13	14	13	15	14	21	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.41	0.59	0.19	0.4	0.31	0.12	0.13	0.13	0.12	0.14	0.15	0.15	0.12	0.13	0.18	0.16	NA	NA	NA	NA
Nickel	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	6.1	6.1	0.6 U	1	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	410	960	149	**1,140**	312	105	110	108	100	120	108	141	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia (mg-N/kg)																				
Ammonia	NE	NE	9.48	10.8	7.63	5.50 J	8.67 J	7.28	7.87	9.54	7.18	12.3	5.15	6.35	12	5.94	9.32	18	14.5	12.8
Total Sulfides (mg/kg)																				
Total Sulfides	NE	NE	1,700	3,680	1,540	416 J	867 J	229	255	166	138	2,650	366	1,010	196	696	665 J	436 J	606 J	948 J
Acid Volatile Sulfides	NE	NE	2,000 J	494 J	4,880	1,290	2,850	433 J	178 J	267 J	244 J	1,130 J	384 J	70.6 J	1,440 J	314 J	NA	NA	NA	NA
Total Solids (%)																				
Total Solids	NE	NE	44.8	45	47.9	50.4	50.3	51.3	52.4	51.8	52.3	47	53.7	53.2	53	54.6	51.7	54.8	54.9	47.1
Total Volatile Solids (mg/kg)	NE	NE	6.65	7.36	6.09	6.25	6.4	6.4	6.27	6.9	6.54	6.49	6.22	6.15	5.91	6.29	5.73	6.35	6.32	7.02
TOC (%)																				
TOC	NE	NE	1.99	2.21	2.29	1.91	2.1	1.62	1.61	2.23	2.22	1.99	1.11	1.85	1.89	1.97	1.85	1.84	1.87	1.99

Notes:
Results exceeding Sediment Management Standard are **BOLD**
Highlighted results indicate reporting limit exceeds Sediment Management Standard
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
* The listed SQS value represents a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
cm - centimeters
LCS/LCSD - Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
NA - Not analyzed
NE - Not established
PCBs - Polychlorinated biphenyls
RPD - Relative percent difference
SRM - Standard reference material
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
VOCs - Volatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
ug/kgOC - micrograms per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**SG-31**	**SG-32**	**SG-33**	**SG-34**	**SG-35**	**SG-36**	**SG-37**	**SG-38**	**SG-39**	**SG-40**	**SG-41**	**SG-42**	**SG-43**	**SG-44**	**SG-45**	**SG-46**	**SG-47**	**BC-1-1**	**BC-1-2**	**BC-2-1**	**BC-2-2**
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	10/08/2009	10/08/2009	10/07/2009	10/13/2009	10/07/2009	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/21/2010	05/21/2010	05/21/2010	5/21/2010	5/21/2010
			0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	2-3 ft	0-10 cm	2-3 ft
VOCs (mg/kg // mg/kgOC)								NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
1,2,4-Trichlorobenzene*	0.81	1.8	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.005 UJ / 0.12 UJ	0.32 U / 22 U	0.0048 U / 0.25 U	0.0044 U / 1.9 U
1,2-Dichlorobenzene*	2.3	2.3	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.001 UJ / 0.02 UJ	0.14 U / 9.7 U	0.001 U / 0.05 U	0.0009 U / 0.39 U
1,4-Dichlorobenzene*	3.1	9.0	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.001 UJ / 0.02 UJ	0.14 U / 9.7 U	0.001 U / 0.05 U	0.0009 U / 0.39 U
SVOCs (ug/kg)																							
2,4-Dimethylphenol	29	29	NA	20 U	20 U	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160 U	320 U	59 U	19 U
2-Methylphenol	63	63	NA	20 U	20 U	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160 U	320 U	59 U	19 U
4-Methylphenol	670	670	NA	**1,400**	**790**	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	240	320 U	57 J	19 U
Benzoic Acid	650	650	NA	79 J	97 J	53 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	440 J	3200 U	**770**	190 UJ
Benzyl Alcohol	57	73	NA	20 U	20 U	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160 U	320 U	59 U	19 U
Pentachlorophenol	360	690	NA	97 U	98 U	98 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	780 U	1600 U	300 U	97 U
Phenol	420	1,200	NA	140	220	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	570 U	320 U	730 U	19 U
SVOCs (mg/kg // mg/kgOC)																							
2-Methylnapthalene*	38	64	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.012 J / 0.69 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.17 U / 4.2 U	0.32 U / 22 U	0.045 U / 2.3 U	0.02 / 8.7
Acenaphthene*	16	57	NA	0.011 J / 0.7 J	0.029 / 1.7	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.22 / 5.4	3.1 / **214**	0.13 / 6.7	0.011 / 4.8
Acenaphthylene*	66	66	NA	0.01 J / 0.64 J	0.02 U / 1.2 U	0.012 J / 0.69 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25 / 6.2	0.32 U / 22 U	0.16 / 8.3	0.011 / 4.8
Anthracene*	220	1,200	NA	0.036 / 2.3	0.04 / 2.4	0.2 / 11.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4 / 35	1.7 / 117	0.61 / 32	0.23 / 100
Benz[a]anthracene*	110	270	NA	0.13 / 8.3	0.13 / 7.6	0.2 / 11.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6 / 64	0.62 / 43	1.6 / 83	1.5 / **655**
Benzo[a]pyrene*	99	210	NA	0.1 / 6.4	0.083 / 4.9	0.11 / 6.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6 / 64	0.2 / 14	1.4 / 73	0.45 / **197**
Benzo(b)fluoranthene	NE	NE	NA	0.13 / 8.3	0.10 / 5.9	0.14 / 8.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2	0.160 J	2.2	0.12
Benzo[g,h,i]perylene*	31	78	NA	0.032 / 2	0.026 / 1.5	0.028 / 1.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 / 27	0.1 U / 6.9 U	0.75 / **39**	0.093 / **41**
Benzo(k)fluoranthene	NE	NE	NA	0.13 / 8.3	0.10 / 5.9	0.14 / 8.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2	0.160 J	2.2	0.12
Bis[2-ethylhexyl]phthalate*	47	78	NA	0.15 / 9.6	0.2 / 11.8	0.19 / 10.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19 / **470**	0.32 U / 22 U	2.6 / **135**	0.062 / 27
Butyl Benzyl Phthalate*	4.9	64	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.55 / **14**	0.32 U / 22 U	0.4 / **21**	0.019 U / 8.3 U
Chrysene*	110	460	NA	0.22 / 14	0.18 / 10.6	0.29 / 16.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.2 / 104	0.58 / 40	2.6 / **135**	1.4 / **611**
Dibenz[a,h]anthracene*	12	33	NA	0.016 J / 1 J	0.011 J / 0.65 J	0.016 J / 0.92 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.43 / 11	0.1 U / 6.9 U	0.38 / 1.0	0.053 / **23**
Dibenzofuran*	15	58	NA	0.013 J / 0.83 J	0.039 / 2.3	0.021 / 1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16 / 4	0.9 / **62**	0.07 / 3.6	0.022 / 9.6
Diethyl Phthalate*	61	110	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16 U / 4 U	0.32 U / 22 U	0.059 U / 3.1 U	0.019 U / 8.3 U
Dimethyl Phthalate*	53	53	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.016 J / 0.92 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.6 / **188**	0.32 U / 22 U	0.39 / 20	0.019 U / 8.3 U
Di-n-butyl Phthalate*	220	1,700	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.29 / 7.2	0.32 U / 22 U	0.39 / 20	0.019 U / 8.3 U
Di-n-octyl Phthalate*	58	4,500	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.44 / 11	0.32 U / 22 U	0.094 / 4.9	0.019 U / 8.3 U
Fluoranthene*	160	1,200	NA	0.41 / 26.1	0.44 / 25.9	0.65 / 37.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.6 / **188**	5.2 / **359**	4.4 / **228**	0.88 / **384**
Fluorene*	23	79	NA	0.016 J / 1 J	0.042 / 2.5	0.048 / 2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3 / 7.4	0.22 UJ / 15 UJ	0.12 / 6.2	0.022 / 9.6
Indeno[1,2,3-cd]pyrene*	34	88	NA	0.032 / 2	0.028 / 1.6	0.031 / 1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.94 / 23	0.1 U / 6.9 U	0.65 / **34**	0.11 / **48**
Napthalene*	99	170	NA	0.0099 J / 0.63 J	0.012 J / 0.71 J	0.012 J / 0.69 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.23 U / 5.7 U	0.1 U / 6.9 U	0.12 U / 6.2 U	0.022 / 9.6
N-nitrosodiphenylamine*	11	11	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16 U / 4 U	11 / **759**	0.059 U / 3.1 U	0.019 U / 8.3 U
Phenanthrene*	100	480	NA	0.12 / 7.6	0.17 / 10	0.27 / 15.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5 / 62	0.33 / 23	1.1 / 57	0.06 / 26
Pyrene*	1,000	1,400	NA	0.37 / 23.6	0.33 / 19.4	0.53 / 30.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0092 UY / 0.23 UY	2.4 / 166	4.2 J / 218 J	0.00096 U / 0.42 U
Total LPAH*	370	780	NA	1.44 / 92	1.33 / 78	2 / 115	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9 / 121	5.1 / 354	2.2 / 116	0.36 / 155
Total HPAH*	960	5,300	NA	0.13 / 8.3	0.1 / 5.9	0.14 / 8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26 / 644	9.3 / 643	20 / 1058	4.8 / **2073**
Total Benzofluoranthenes*	230**	450**	NA	0.26 / 17	0.2 / 12	0.28 / 16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4 / 158	0.32 J / 22 J	4.4 / 228	0.24 / 105
Pesticides (mg/kg // mg/kgOC)																							
Hexachlorobenzene*	0.38	2.3	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0092 UY / 0.23 UY	0.00097 U / 0.07 U	0.00098 U / 0.05 U	0.00096 U / 0.42 U
Hexachlorobutadiene*	3.9	6.2	NA	0.02 U / 1.3 U	0.02 U / 1.2 U	0.02 U / 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0018 U / 0.04 U	0.00097 U / 0.07 U	0.00098 U / 0.05 U	0.00096 U / 0.42 U
PCBs (mg/kg // mg/kgOC)																							
Aroclor 1016	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07 U	0.0039 U	0.210 U	0.0039 U
Aroclor 1221	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07 U	0.0039 U	0.210 U	0.0039 U
Aroclor 1232	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07 U	0.0039 U	0.210 U	0.0039 U
Aroclor 1242	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07 U	0.0039 U	0.210 U	0.0039 U
Aroclor 1248	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.35 UY	0.0098 UJ	0.370 UY	0.0039 U
Aroclor 1254	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9	0.0065	3.1	0.0057
Aroclor 1260	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.48	0.0075	0.62	0.0039 U
Total PCBs*	12	65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4 / **59**	0.014 / 0.97	3.7 / **193**	0.0057 / 2.5

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**SG-31**	**SG-32**	**SG-33**	**SG-34**	**SG-35**	**SG-36**	**SG-37**	**SG-38**	**SG-39**	**SG-40**	**SG-41**	**SG-42**	**SG-43**	**SG-44**	**SG-45**	**SG-46**	**SG-47**	**BC-1-1**	**BC-1-2**	**BC-2-1**	**BC-2-2**
			10/08/2009	10/08/2009	10/07/2009	10/13/2009	10/07/2009	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/19/2010	05/21/2010	05/21/2010	05/21/2010	5/21/2010	5/21/2010
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	2-3 ft	0-10 cm	2-3 ft
Organotins (ug/kg)																							
Tributyltin as TBT Ion	NE	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	**36000**	19	**17000**	**150**
Dibutyl Tin Ion	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9400	14 UJ	2900	82
Butyl Tin Ion	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	730	10 U	2700	29
Organotins-Porewater (ug/L)																							
Tributyltin as TBT Ion	0.05	0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.6**	NA	**6.4**	NA
Dibutyl Tin Ion	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.56	NA	4	NA
Butyl Tin Ion	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.24	NA	1.2	NA
Petroleum Hydrocarbons (mg/kg)																							
Gasoline Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 >	20 >	NA	20 U
Diesel Range Organics - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 >	50 >	NA	50 >
Lube Oil - HCID	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100 >	100 >	NA	100 U
Diesel Range Organics	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	690	7400	NA	49
Lube Oil	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2300	680	NA	25
Metals (mg/kg)																							
Arsenic	57	93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**240**	8	24	6 U
Cadmium	5.1	6.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	0.2 U	0.4	0.2 U
Chromium	260	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	176	24.4	78.2	20.4
Copper	390	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3280**	17.9	**2410**	33.8
Lead	450	530	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1210**	7	94	6
Mercury	0.41	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.97**	0.08	**1.21**	0.07
Nickel	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	6.1	6.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	0.4 U	1.2	0.3 U
Zinc	410	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1980**	33	**627**	39
Ammonia (mg-N/kg)																							
Ammonia	NE	NE	7.65	17.4	17.3	7.25	3.49	11.4	10.2	17.8	10.5	10.5	12.4	11.4	17.7	7.51	9.28	10.2	5.34	0.39	1.37	0.49	3.55
Total Sulfides (mg/kg)																							
Total Sulfides	NE	NE	707 J	1,460 J	643 J	990	245 J	692	1020	1140	316	280	1050	384	265	415	303	334	311	40.4	10.2	1.04 UJ	1.11 UJ
Acid Volatile Sulfides	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Solids (%)																							
Total Solids	NE	NE	54.2	45.7	49.1	48.9	38.1	47	48.1	43.1	49.1	50.9	47.7	48.1	51	51.5	50.5	50.1	34.7	72.7	75.8	82.4	88.2
Total Volatile Solids (mg/kg)	NE	NE	5.3	6.55	6.74	6.28	6.14	6.62	6.92	7.15	6.64	6.82	6.44	7.01	6.95	6.47	6.62	7.36	7.64	5.55	1.69	2.32	0.96
TOC (%)																							
TOC	NE	NE	1.39	1.57	1.7	1.74	2.09	2.1	2.02	3.05	1.81	2.26	2.1	2.24	2.72	1.94	2.22	2.59	3.47	4.04	1.45	1.93	0.229

Notes:
Results exceeding Sediment Management Standard are **BOLD**
Highlighted results indicate reporting limit exceeds Sediment Management Standard
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
* The listed SQS value represents a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
cm - centimeters
LCS/LCSD - Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
NA - Not analyzed
NE - Not established
PCBs - Polychlorinated biphenyls
RPD - Relative percent difference
SRM - Standard reference material
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
VOCs - Volatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
ug/kgOC - micrograms per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**BC-3-1** 05/21/2010		**BC-3-2** 05/24/2010	**BC-4-1** 05/21/2010	**BC-4-2** 05/24/2010	**BC-5-1** 05/21/2010	**BC-5-2** 05/24/2010	**BC-6-1** 05/21/2010	**BC-6-2** 05/24/2010	**BC-7-2** 06/03/2010	**BC-8-2** 06/03/2010	**BC-9-2** 06/03/2010	**BC-10-2** 06/03/2010	**ESY-MS1** 03/05/03	**FD of ESY-MS1** 03/05/03	**ESY-MS2** 03/05/03	**ESY-MS3** 03/05/03	**ESY-MS4** 03/05/03	**ESY-MS5** 03/05/03	**ESY-MS6** 03/05/03
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	Field Duplicate 0-10 cm	2-3 ft	0-10 cm	2-3 ft	0-10 cm	2-3 ft	0-10 cm	2-3 ft	1.5-4 ft	3-4 ft	1.5-2.5 ft	0.5-1.5 ft	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
VOCs (mg/kg // mg/kgOC)																						
1,2,4-Trichlorobenzene*	0.81	1.8	0.0047 U / 0.25 U	0.0047 U / 0.23 U	0.0043 U / 4.2 U	0.005 UJ / 0.14 UJ	0.0044 U / 1.2 U	0.0055 U / 0.07 U	0.0047 U / 0.93 U	0.0045 U / 0.93 U	0.0044 U / 0.86 U	NA	NA	NA	NA	0.74 U	0.73 U	0.09 U	0.28 U	0.91 U	0.87 U	1.2 U
1,2-Dichlorobenzene*	2.3	2.3	0.0009 U / 0.048 U	0.0009 U / 0.04 U	0.0009 U / 0.87 U	0.001 UJ / 0.03 UJ	0.0009 U / 0.24 U	0.0011 U / 0.014 U	0.001 U / 0.2 U	0.0009 U / 0.19 U	0.0009 U / 0.18 U	NA	NA	NA	NA	0.74 U	0.73 U	0.09 U	0.83 U	0.91 U	0.87 U	1.2 U
1,4-Dichlorobenzene*	3.1	9.0	0.0009 U / 0.048 U	0.0009 U / 0.04 U	0.0009 U / 0.87 U	0.001 UJ / 0.03 UJ	0.0009 U / 0.24 U	0.0011 U / 0.014 U	0.001 U / 0.2 U	0.0009 U / 0.19 U	0.0009 U / 0.18 U	NA	NA	NA	NA	0.74 U	0.73 U	0.09 U	0.83 U	0.91 U	0.87 U	1.2 U
SVOCs (ug/kg)																						
2,4-Dimethylphenol	29	29	120 U	20 U	20 U	520 U	20 U	65 U	20 U	20 U	19 U	NA	NA	NA	NA	20 U	19 U	19 U	20 U	20 U	20 U	19 U
2-Methylphenol	63	63	120 U	20 U	20 U	520 U	20 U	**95**	20 U	20 U	19 U	NA	NA	NA	NA	20 U	19 U	19 U	20 U	20 U	20 U	19 U
4-Methylphenol	670	670	180	110	20 U	520 U	20 U	68	20 U	20 U	19 U	NA	NA	NA	NA	20 U	19 U	19 U	140 J	20 U	40 J	20 J
Benzoic Acid	650	650	1200 U	310	200 U	5200 U	200 U	390 J	200 U	200 U	190 U	NA	NA	NA	NA	200 U	190 U	190 U	210	200 U	200 U	190 U
Benzyl Alcohol	57	73	120 U	42	20 U	520 U	20 U	**1400**	20 U	20 U	19 U	NA	NA	NA	NA	20 UJ	97 UJ	19 U	20 U	20 U	20 U	19 U
Pentachlorophenol	360	690	590 U	58 J	99 U	2600 UJ	97 U	260 J	100 U	99 U	97 U	NA	NA	NA	NA	98 U	97 UJ	97 U	160 J	98 U	98 U	96 U
Phenol	420	1,200	520 U	580 U	20 U	590 U	20 U	900 U	20 U	350 U	19 U	NA	NA	NA	NA	20 U	19 U	19 U	20 U	20 U	20 U	19 U
SVOCs (mg/kg // mg/kgOC)																						
2-Methylnapthalene*	38	64	0.093 U / 5 U	0.021 U / 1 U	0.0047 U / 4.6 U	0.044 U / 1.2 U	0.028 / 7.4	0.22 U / 2.8 U	0.039 / 7.7	0.014 J / 2.9 J	0.12 / 24	NA	NA	NA	NA	0.74 U	0.73 U	0.9 U	2.1	0.91 U	0.87 U	1.2 U
Acenaphthene*	16	57	0.28 / 15	0.063 / 3.1	0.0061 / 5.9	0.023 / 0.64	0.023 / 6.1	0.12 / 1.5	**0.3 / 59**	**0.24 / 49**	**0.25 / 49**	NA	NA	NA	NA	3.0 J	4.6 J	0.95	5	.91 U	8.7	3.1
Acenaphthylene*	66	66	0.13 / 7	0.12 / 5.9	0.0047 U / 4.6 U	0.069 / 1.9	0.009 / 2.4	0.29 / 3.7	0.0098 / 1.9	0.13 / 27	0.012 / 2.4	NA	NA	NA	NA	1.4 J	3.1 J	2	9.6	1.4	7.8	2.9
Anthracene*	220	1,200	0.66 / 36	0.77 / 38	0.0047 U / 4.6 U	0.52 U / 14.4 U	0.11 / 29.2	0.88 / 11	0.094 / 19	0.24 / 49	0.11 / 22	NA	NA	NA	NA	4.4 J	8.1 J	5.2	26	3.5	27	6.3
Benz[a]anthracene*	110	270	2.3 / **124**	1.2 / 59	0.0085 / 8.3	1 / 27.7	0.19 / 50.4	2.8 / 36	0.079 / 16	0.86 / **177**	0.046 / 9	NA	NA	NA	NA	13 J	25 J	15	96	10	96	16
Benzo[a]pyrene*	99	210	1.9 / **102**	1 / 49	0.0075 / 7.3	0.96 / 26.6	0.061 / 16.2	2.6 / 33	0.049 / 9.7	0.55 / **113**	0.03 / 5.9	NA	NA	NA	NA	8.9 J	18 J	13	54	7.3	33	11
Benzo(b)fluoranthene	NE	NE	2.4	1.3	0.020 U	1	0.071	3.4	0.041	0.46	0.02	NA	NA	NA	NA	13 J	32 J	19	92	10	57	20
Benzo[g,h,i]perylene*	31	78	0.8 / **43**	0.38 / 19	0.0047 U / 4.6 U	0.51 / 14	0.026 / 6.9	1.2 / 15	0.027 / 5.3	0.28 / **58**	0.018 / 3.5	NA	NA	NA	NA	4.4 J	8.1 J	6.7	18	1.6	7	3.1
Benzo(k)fluoranthene	NE	NE	2.4	1.3	0.020 U	1	0.071	3.4	0.041	0.46	0.02	NA	NA	NA	NA	10 J	17 J	17	38	10	34	18
Bis[2-ethylhexyl]phthalate*	47	78	8.5 / **457**	1.9 / **93**	0.027 / 26	4.7 / **130**	0.02 / 5.3	120 / **1527**	0.046 / 9.1	0.16 / 33	0.013 J / 2.6 J	NA	NA	NA	NA	13 UJ	27 J	5.2 U	**88**	3.8 U	30	16 U
Butyl Benzyl Phthalate*	4.9	64	1.4 / **75**	0.27 / **13**	0.02 U / 19 U	0.34 J / **9.4 J**	0.02 U / 5.3 U	0.87 / **11**	0.02 U / 3.9 U	0.02 U / 4.1 U	0.019 U / 3.7 U	NA	NA	NA	NA	1.4	1.7	0.9 U	**46**	0.91 U	**19**	1.9
Chrysene*	110	460	3.3 / **177**	2.5 / 1.0	0.011 / 11	1.6 / 44	0.2 / 53	4.5 / 57	0.089 / 18	1 / **206**	0.053 / 10	NA	NA	NA	NA	17 J	35 J	27	**150**	17	**135**	29
Dibenz[a,h]anthracene*	12	33	0.38 / **20**	0.22 / 11	0.0047 U / 4.6 U	0.23 / 6.4	0.01 J / 2.7 J	0.6 / 7.6	0.0098 / 1.9	0.16 / **32**	0.0045 / 0.88	NA	NA	NA	NA	1.9 J	4.2 J	2.9	11	0.91	4.3	1.3
Dibenzofuran*	15	58	0.11 / 5.9	0.039 / 1.9	0.0047 / 4.6	0.021 / 0.58	0.036 / 9.5	0.13 / 1.7	0.12 / **24**	0.092 / **19**	0.17 / **33**	NA	NA	NA	NA	0.89	1.2	0.95	3	0.91 U	2.3	2.3
Diethyl Phthalate*	61	110	0.12 U / 6.5 U	0.02 U / 0.98 U	0.02 U / 19 U	0.52 U / 14 U	0.02 U / 5.3 U	0.065 U / 0.83 U	0.02 U / 3.9 U	0.02 U / 4.1 U	0.019 U / 3.7 U	NA	NA	NA	NA	0.74 U	0.73 U	0.9 U	0.83 U	0.91 U	2.2	1.2 U
Dimethyl Phthalate*	53	53	0.37 / 20	0.22 / 11	0.02 U / 19 U	3.2 / **89**	0.02 U / 5.3 U	8.2 / **104**	0.02 U / 3.9 U	0.025 / 5.1	0.019 U / 3.7 U	NA	NA	NA	NA	4.4	4.6	2.5	5.8	0.91 U	3.5	6.3
Di-n-butyl Phthalate*	220	1,700	0.46 / 25	0.3 / 15	0.02 U / 19 U	0.52 U / 14 U	0.02 U / 5.3 U	0.51 / 6.5	0.02 U / 3.9 U	0.013 J / 2.7 J	0.019 U / 3.7 U	NA	NA	NA	NA	0.74 U	0.73 U	0.9 U	2.1	0.91 U	2.5	1.2 U
Di-n-octyl Phthalate*	58	4,500	0.25 / 13	0.12 / 5.9	0.02 U / 19 U	0.52 U / 14 U	0.02 U / 5.3 U	0.89 / 11	0.02 U / 3.9 U	0.013 J / 2.7 J	0.019 U / 3.7 U	NA	NA	NA	NA	0.74 U	0.73 U	0.9 U	1.2 U	0.91 U	0.87 U	1.3
Fluoranthene*	160	1,200	8.1 / **436**	2.8 / 137	0.044 / 43	2.7 / 75	0.46 / 122	4.2 / 53	0.4 / 79	1.2 / 247	0.35 / 69	NA	NA	NA	NA	35 J	100 J	18	**367**	8.6	**391**	41
Fluorene*	23	79	0.18 / 9.7	0.1 / 4.9	0.0047 U / 4.6 U	0.037 / 1	0.04 / 11	0.25 / 3.2	0.2 / **39**	0.14 / **29**	0.39 / **77**	NA	NA	NA	NA	1.4 J	2 J	1.7	5.8	0.91	7.8	2.5
Indeno[1,2,3-cd]pyrene*	34	88	0.73 / **39**	0.39 / 19	0.0047 U / 4.6 U	0.46 J / 13 J	0.023 / 6.1	1.1 / 14	0.023 / 4.5	0.26 / **54**	0.014 / 2.8	NA	NA	NA	NA	5.2 J	10 J	8.1	25	2.4	10	4.1
Napthalene*	99	170	0.086 J / 4.6 J	0.033 U / 1.6 U	0.0047 U / 4.6 U	0.045 U / 1.2 U	0.061 / 16	0.24 U / 3.1 U	0.11 / 22	0.026 / 5.3	0.24 / 47	NA	NA	NA	NA	0.93	1.1	0.95	2.5	0.91 U	1.4	1.3
N-nitrosodiphenylamine*	11	11	0.12 U / 6.5 U	0.02 U / 0.98 U	0.02 U / 19 U	0.52 U / 14 U	0.02 U / 5.3 U	0.065 U / 0.83 U	0.02 U / 3.9 U	0.02 U / 4.1 U	0.019 U / 3.7 U	NA	NA	NA	NA	0.74 U	0.73 U	0.9 U	1.6 U	0.91 U	1 U	1.2 U
Phenanthrene*	100	480	2.5 J / **134 J**	0.6 / 29	0.0099 / 9.6	1.6 / 44	0.097 / 26	0.99 / 13	0.27 / 53	0.44 / 91	0.78 / **153**	NA	NA	NA	NA	10	13	10	42	4.5	65	24
Pyrene*	1,000	1,400	0.0024 U / 0.13 U	0.00098 U / 0.05 U	0.00099 U / 0.96 U	0.0015 U / 0.04 U	0.00097 U / 0.26 U	0.0015 U / 0.02 U	0.00099 U / 0.2 U	0.00098 U / 0.2 U	0.00097 U / 0.19 U	NA	NA	NA	NA	35 J	85 J	44 J	267	18	235	49
Total LPAH*	370	780	3.8 / 206	1.7 / 82	0.016 / 16	1.8 / 49	0.34 / 90	2.77 / 35	0.98 / 194	1.22 / 250	1.78 / 350	NA	NA	NA	NA	22	32	21	91	10	117	40
Total HPAH*	960	5,300	22.4 / **1204**	9.8 / 478	0.072 / 69	9.5 / 263	1.14 / 303	24 / 306	0.798 / 157	5.24 / **1079**	0.655 / 129	NA	NA	NA	NA	144	333	171	**1,116**	87	1,001	192
Total Benzofluoranthenes*	230**	450**	4.8 / **258**	1.3 / 63	0.02 U / 19 U	2 / 55	0.142 / 38	6.8 / 87	0.082 / 16	0.92 / 189	0.02 / 3.9	NA	NA	NA	NA	23 J	49 J	36	129	21	90	38
Pesticides (mg/kg // mg/kgOC)																						
Hexachlorobenzene*	0.38	2.3	0.0024 U / 0.13 U	0.00098 U / 0.05 U	0.00099 U / 0.96 U	0.0015 U / 0.04 U	0.00097 U / 0.26 U	0.0015 U / 0.02 U	0.00099 U / 0.2 U	0.00098 U / 0.2 U	0.00097 U / 0.19 U	NA	NA	NA	NA	0.74 U	0.73 U	0.90 U	0.042 U	0.91 U	0.043 U	1.2 U
Hexachlorobutadiene*	3.9	6.2	0.0024 U / 0.13 U	0.00098 U / 0.05 U	0.00099 U / 0.96 U	0.0015 U / 0.04 U	0.00097 U / 0.26 U	0.0015 U / 0.02 U	0.00099 U / 0.2 U	0.00098 U / 0.2 U	0.00097 U / 0.19 U	NA	NA	NA	NA	0.74 U	0.73 U	0.90 U	1.2 U	0.91 U	0.87 U	1.2 U
PCBs (mg/kg // mg/kgOC)																						
Aroclor 1016	NE	NE	1.0 U	0.2 U	0.0039 U	0.059 U	0.0038 U	0.073 U	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	19 U	NA	20 U	NA
Aroclor 1221	NE	NE	1.0 U	0.2 U	0.0039 U	0.059 U	0.0038 U	0.073 U	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	38 U	NA	39 U	NA
Aroclor 1232	NE	NE	1.0 U	0.2 U	0.0039 U	0.059 U	0.0038 U	0.073 U	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	19 U	NA	20 U	NA
Aroclor 1242	NE	NE	1.0 U	0.2 U	0.0039 U	0.059 U	0.0038 U	0.073 U	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	19 U	NA	20 U	NA
Aroclor 1248	NE	NE	5.3 UY	1.0 UY	0.0039 U	0.150 UY	0.0038 U	0.37 UY	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	19 U	NA	20 U	NA
Aroclor 1254	NE	NE	18	7.6	0.0062	0.59	0.0038 U	3.3	0.006	0.0081	0.0039 U	NA	NA	NA	NA	NA	NA	NA	220	NA	47	NA
Aroclor 1260	NE	NE	2.1 UY	1.0 UY	0.0039 U	0.14	0.0038 U	0.54	0.004 U	0.0078 U	0.0039 U	NA	NA	NA	NA	NA	NA	NA	68 Y	NA	38 Y	NA
Total PCBs*	12	65	18 / **968**	7.6 / **371**	0.0062 / 6.0	0.73 / **20**	0.0038 U / 1.0 U	3.8 / **49**	0.006 / 1.2	0.0081 / 1.7	0.0039 U / 0.77 U	NA	NA	NA	NA	NA	NA	NA	9.2	NA	2.0	NA

Table 4-4
Summary of Marine Sediment Analytical Results
Everett Shipyard
Everett, Washington
RI/FS

	Sediment Management Standards [a]		**BC-3-1**		**BC-3-2**	**BC-4-1**	**BC-4-2**	**BC-5-1**	**BC-5-2**	**BC-6-1**	**BC-6-2**	**BC-7-2**	**BC-8-2**	**BC-9-2**	**BC-10-2**	**ESY-MS1**	**FD of ESY-MS1**	**ESY-MS2**	**ESY-MS3**	**ESY-MS4**	**ESY-MS5**	**ESY-MS6**
			05/21/2010		05/24/2010	05/21/2010	05/24/2010	05/21/2010	05/24/2010	05/21/2010	05/24/2010	06/03/2010	06/03/2010	06/03/2010	06/03/2010	03/05/03	03/05/03	03/05/03	03/05/03	03/05/03	03/05/03	03/05/03
	Sediment Quality Standard (SQS)	Cleanup Screening Level (CSLs)	0-10 cm	Field Duplicate 0-10 cm	2-3 ft	0-10 cm	2-3 ft	0-10 cm	2-3 ft	0-10 cm	2-3 ft	1.5-4 ft	3-4 ft	1.5-2.5 ft	0.5-1.5 ft	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Organotins (ug/kg)																						
Tributyltin as TBT Ion	NE	73	**45000**	**20000**	29	**7300**	4	**25000**	17	32	3.2 U	NA	NA	NA	NA	**3,000**	NA	49	**900**	NA	NA	NA
Dibutyl Tin Ion	NE	NE	9700	5800	5.2 UJ	2400	5.2 UJ	7900	5.4 UJ	25	4.7 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NE	2400	2300	3.7 U	440	3.7 U	460	3.8 U	8	3.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins-Porewater (ug/L)												NA	NA	NA	NA							
Tributyltin as TBT Ion	0.05	0.15	**15**	**4.2**	NA	**2.7**	NA	**1**	NA	0.015	NA	**NA**	**NA**	**NA**	**NA**	**0.66**	**0.65**	0.033	**0.34**	0.019 U	**0.21**	0.024
Dibutyl Tin Ion	NE	NE	3	2.5	NA	0.72	NA	0.22	NA	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NE	NE	0.38	0.69	NA	0.33	NA	0.1	NA	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (mg/kg)																						
Gasoline Range Organics - HCID	NE	NE	NA	NA	NA	20 U	NA	NA	NA	NA	NA	120 >	120 >	20 U	120 >	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics - HCID	NE	NE	NA	NA	NA	50 >	NA	NA	NA	NA	NA	310 >	310 >	50 U	290 >	NA	NA	NA	NA	NA	NA	NA
Lube Oil - HCID	NE	NE	NA	NA	NA	100 >	NA	NA	NA	NA	NA	620 >	620 U	100 U	580 >	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NE	NE	NA	NA	NA	230	NA	NA	NA	NA	NA	4700	2700	NA	7800	NA	NA	NA	NA	NA	NA	NA
Lube Oil	NE	NE	NA	NA	NA	1500	NA	NA	NA	NA	NA	260	1100	NA	380	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																						
Arsenic	57	93	**90**	30	6 U	**110**	8	**99**	8	6 U	14	NA	NA	NA	NA	20	20	14	32	10	30	17
Cadmium	5.1	6.7	1.8	0.7	0.2 U	3.2	0.4	4	0.3	0.2 U	0.3	NA	NA	NA	NA	0.7	0.9	0.5	0.4	0.5	0.6	0.4
Chromium	260	270	190	96	30.9	86	29.3	85.6	30.8	36.9	32.9	NA	NA	NA	NA	64	60	51.5	84.1	48	83	52.9
Copper	390	390	**6190**	**2730**	21.3	**1390**	26	**1920**	24.9	36.4	23.2	NA	NA	NA	NA	161	174	117	**1,800**	80.1	**531**	76.9
Lead	450	530	225	133	3	217	21	**459**	21	18	17	NA	NA	NA	NA	52	46	20	94	13	56	17
Mercury	0.41	0.59	**6.7**	**1.88**	0.05	**0.88**	0.07	**1.99**	0.06	0.04	0.04	NA	NA	NA	NA	0.29	0.27	0.2	**0.53**	0.1	0.3	0.1
Nickel	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52	52	43	51	41	53	47
Silver	6.1	6.1	**10.5**	0.8 UJ	0.3 U	0.9 U	0.4 U	0.8	0.4 U	0.3 U	0.4 U	NA	NA	NA	NA	0.6 U	0.6 U	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U
Zinc	410	960	**2780**	**649**	53	**734**	56	**1070**	52	74	51	NA	NA	NA	NA	178 J	325 J	148	**797**	107	**433**	148
Ammonia (mg-N/kg)																						
Ammonia	NE	NE	1.25	0.48	0.25	0.34	2.17	1.63	1.86	0.61	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Sulfides (mg/kg)																						
Total Sulfides	NE	NE	1.33 UJ	1.9	1.1 UJ	18.9	273	752	137	292	155	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acid Volatile Sulfides	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Solids (%)																						
Total Solids	NE	NE	78.5	76.7	87.9	78.7	79	60.8	80.4	82	82.6	NA	NA	NA	NA	47.7	48	50.3	57.2	46	45.3	50.8
Total Volatile Solids (mg/kg)	NE	NE	2.65	3.59	0.66	3.83	1.82	9.87	1.56	1.5	1.48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOC (%)																						
TOC	NE	NE	1.86	2.05	0.103	3.61	0.377	7.86	0.507	0.486	0.509	NA	NA	NA	NA	2.7	2.6	2.1	2.4	2.2	2.3	1.6

Notes:
Results exceeding Sediment Management Standard are **BOLD**
Highlighted results indicate reporting limit exceeds Sediment Management Standard
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
* The listed SQS value represents a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
cm - centimeters
LCS/LCSD - Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
NA - Not analyzed
NE - Not established
PCBs - Polychlorinated biphenyls
RPD - Relative percent difference
SRM - Standard reference material
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
VOCs - Volatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
ug/kgOC - micrograms per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 6-1
Preliminary Groundwater Cleanup Levels for Indicator Hazardous Substances [1]
Everett Shipyard
Everett, Washington
RI/FS

Constituent	Typical PQL	Toxic Substances Criteria (WAC 173-201A) [2] Marine Water		National Recommended Water Quality Criteria [3] Saltwater		National Recommended Water Quality Criteria [3] Health (consumptio Organism Only	National Toxics Rule [4] Saltwater		Preliminary Cleanup Level [5]
		Acute	Chronic	CMC	CCC		CMC	CCC	
Total Metals (mg/L)									
Arsenic*	0.001	0.069 [a,b]	0.036 [b,c]	0.069	0.036	0.00014	0.069	0.036	0.005 [d]
Dissolved Metals (mg/L)									
Copper	0.002	0.0048 [a,b]	0.0031 [b,c]	0.0048	0.0031	NE	0.0024	0.0024	0.0031 [e]
Nickel*	0.01	0.074 [a,b]	0.0082 [b,c]	0.074	0.0082	4.6	0.074	0.0082	0.01 [f]
Zinc*	0.01	0.09 [a,b]	0.081 [b,c]	0.09	0.081	26	0.09	0.081	0.081 [e]
SVOCs (µg/L)									
BEHP*	1.0	NE	NE	NE	NE	2.2	NE	NE	2.2 [g]

Notes:

[1] The selection of preliminary cleanup levels was based on the most stringent applicable surface water quality cleanup level taking into account the typical PQL and natural background levels. PQL or natural background levels (whichever is lowest) were used when they exceeded the applicable surface water quality criteria.
[2] Water Quality Standards For Surface Waters of the State of Washington, Toxic Substances Criteria, WAC 173-201A. Last update November 2006.
[3] National Recommended Water Quality Criteria, USEPA, 2006.
[4] National Toxics Rule, 40 CFR 131.36, USEPA, 2006.
[5] Proposed cleanup levels based upon the information presented in the RI Data Submittal Phase II (URS, 2010).
[a] The metals criteria are associated with the dissolved fraction of the water column.
[b] A 1-hour average concentration not to be exceeded more than once every three years on the average.
[c] A 4-day average concentration not to be exceeded more than once every three years on the average.
[d] MTCA Method A cleanup level which is based upon natural background.
[e] Cleanup Level based upon Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington (2006), and National Recommended Water Quality Criteria (NRWQC) 2006 which was recently approved by Ecology as a groundwater cleanup level protective of marine surface water for the Port of Everett West End Site.
[f] Cleanup Level based upon Practical Quantification Limit (PQL).
[g] Cleanup Level based upon National Toxics Rule (NTR).
[*] Hazardous Indicator Substance
BEHP - bis(2-Ethylhexyl)phthalate
CCC - Criteria continuous concentration (chronic)
CMC - Criteria maximum concentration (acute)
NA - Not applicable
NE - Not established
PQL - practical quantitation limit
SVOCs - Semivolatile organic compounds
mg/L - milligrams per liter
ug/L - micrograms per liter

Table 6-2
Preliminary Soil Cleanup Levels for Indicator Hazardous Substances[1]
Everett Shipyard
Everett, Washington
RI/FS

Constituent	Background Soil Concentrations In Puget Sound[2]	Typical PQL	MTCA Method A Cleanup Level (Unrestricted Land Use)[3]	MTCA Method B[4] Carcinogenic	MTCA Method B[4] Non-Carcinogenic	Preliminary Cleanup Level[5]
Total Petroleum Hydrocarbons (mg/kg)						
Diesel-range*	NA	5.5	2,000	NE	NE	2,000
Oil-range*	NA	11	2,000	NE	NE	2,000
Carcinogenic Polycyclic Aromatic Hydrocarbons (ug/kg)						
Benzo(a)pyrene*	NA	5	100	140	NE	140
TTEC [a*]	NA	NA	100	140	NE	140
Polychlorinated Biphenyls (ug/kg)						
Aroclor 1254*	NA	30	NE	NE	1,600	1,000[b]
Total PCBs*	NA	NA	1,000	500	NE	1,000[b]
Semi-Volatile Organic Compounds (ug/kg)						
bis(2-Ethylhexyl)phthalate	NA	70	NE	71,000	1,600,000	71,000
Metals (mg/kg)						
Antimony*	5	5	NE	NE	32	32
Arsenic*	20[c]	5	20	0.67	24	20
Copper*	36	0.2	NE	NE	3,200	3,200
Lead*	24	2	250	NE	NE	250
Zinc	85	1	NE	NE	24,000	24,000

Notes:

[1] The selection of preliminary cleanup levels was based on the most stringent MTCA Method B cleanup levels for unrestriced land use taking into account the typical PQL and natural background levels. Preliminary soil cleanup levels based on the protection of marine surface water resources were not established based on an empirical demonstration indicating that concentrations in soil are protective of groundwater as marine surface water. PQI

[2] Natural Background Soil Metals Concentrations in Washington State, Table 1: Statewide & Regional 90th Percentile Values (Puget Sound), Ecology, October 1994

[3] MTCA Method A Soil Cleanup Levels for Unrestricted land Uses, Table 740-1.

[4] MTCA - Model Toxics Control Act Cleanup Regulation, WAC 173-340. 2006 and 2011 MTCA Method A and B values are from Ecology website CLARC tables downloaded April 2011 (https://fortress.wa.gov/ecy/clar when available. 2011 Method B values are from Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC) Version 3.1, Ecology Publication #94-145 Updated April 2011.

[5] Proposed cleanup levels based upon the information presented in the RI Data Submittal Phase II (URS, 2010).

[a] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single h and compared to the MTCA Method B cleanup level for benzo(a)pyrene.

[b] Federal (Toxic Substances Control Act, TSCA) cleanup standard for high occupancy areas is 1,000 ug/kg, consistent with MTCA Method A. Federal standard is used as cleanup level because it is adequately protective (risk is less than 1 x 10-5).

[c] MTCA Method A Cleanup Level which is based on natural background for soil.

[*] Hazardous Indicator Substance

NA - Not analyzed

NE - Not established

PQL - practical quantitation limit

mg/kg - milligram per kilogram

Table 6-3
Sediment Cleanup Levels for Indicator Hazardous Substances
Everett Shipyard
Everett, Washington
RI/FS

Consittuent[4]	Sediment Management Standards [1]		Cleanup Level
	Sediment Quality Standard (SQS) [2]	Cleanup Screening Level (CSLs) [3]	
SVOCs (ug/kg)			
2-Methylphenol	63	63	63
4-Methylphenol	670	670	670
Benzyl Alcohol	57	73	57
SVOCs (mg/kgOC) *			
Acenaphthene	16	57	16
Benz[a]anthracene	110	270	110
Benzo[a]pyrene	99	210	99
Benzo[g,h,i]perylene	31	78	31
Bis[2-ethylhexyl]phthalate	47	78	47
Butyl Benzyl Phthalate	4.9	64	4.9
Chrysene	110	460	110
Dibenz[a,h]anthracene	12	33	12
Dibenzofuran	15	58	15
Dimethyl Phthalate	53	53	53
Fluoranthene	160	1,200	160
Fluorene	23	79	23
Indeno[1,2,3-cd]pyrene	34	88	34
Naphthalene	99	170	99
N-nitrosodiphenylamine	11	11	11
Phenanthrene	100	480	100
Pyrene	1,000	1,400	1,000
Total LPAH	370	780	370
Total HPAH	960	5,300	960
Total Benzofluoranthenes**	230	450	230
PCBs (mg/kgOC)*			
Total PCBs	12	65	12
Organotins (ug/kg)			
Tributyltin as TBT Ion	NE	73	73
Organotins-Porewater (ug/L)			
Tributyltin as TBT Ion	0.05	0.15	0.05
Metals (mg/kg)			
Arsenic	57	93	57
Copper	390	390	390
Lead	450	530	450
Mercury	0.41	0.59	0.41
Silver	6.1	6.1	6.1
Zinc	410	960	410

Notes:
[1] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
[2] WAC 173-204-320, Table 1 Marine Sediment Quality Standards
[3] WAC 173-204-520, Table III Puget Sound Marine Sediment Cleanup Screening Levels and Minimum Cleanup Levels
[4] All constituents are considered to be indicator hazardous substances.
* The listed values represent a concentration in parts per million (ppm) 'normalized' on a TOC basis.
** The listed values represent the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
NE - Not established
VOCs - Volatile organic compounds
SVOCs - Semivolatile organic compounds
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
PCBs - Polychlorinated biphenyls
TOC - Total organic carbon
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
mg/kgOC - milligrams per kilogram, 'normalized' for TOC
mg/kg - milligrams per kilogram

Table 7-1 Applicable Legal Requirements
Everett Shipyard
Everett, Washington
RI/FS

Chemical-specific ARARs:

Groundwater:

Washington State Water Quality Standards for Surface Waters, WAC 173-201A-24(3) and(5), and WAC 173-201A-600

Federal Clean Water Act, 33 USC 1251-1376, National Recommended Water Quality Criteria 2006

National Toxics Rule, 33 USC 1251; 40 CFR 131.36(b)(1) and(d)(14); WAC 173-201A-240(5)

Soil:

MTCA Regulations, WAC 173-340-740(3) and 173-340-355

Toxic Substances Control Act, 15 U.S.C. §2601 et seq. 40 CFR 761.61

Marine Sediment:

WAC 173-340-710(7)(d), the Sediment Management Standards (SMS: WAC 173-204)

Location-specific ARARs:

Endangered Species Act, 16 USC 1531-1543, 50 CFR 402, 50 CFR 17

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 USC 1801 et. seq., 50 CFR Part 600

Fish and Wildlife Conservation Act, 16 USC 2901; 50 CFR 83

Federal Coastal Zone Management Act (CZMA), 16 USC 1451-1464; RCW 90.58; WAC 173-27-060, 15 CFR 923-930

Archaeological and Historic Preservation Act, 16 USC 469.

Archaeological Resources Protection Act, 16 USC 470aa; 43 CFR 7

Action-specific ARARs:

In-Water Work

Clean Water Act, Section 404 - Dredge or Fill Requirements Regulations, 33 USC 1344(a)–(d), 33 CFR Parts 320-330, 40 CFR 230

Clean Water Act, Section 401, Water Quality Certification, 33 USC 1340, WAC 173-225-010.

Temporary Modification of Water Quality Criteria and Other Requirements to Modify Water Quality Criteria, RCW 90.48; WAC 173-201A-410 through –450. Chapters 173-201A-400 through -450

Washington Hydraulics Project Approval, Chapter 75.55.061 RCW, Chapter 220-110 WAC.

Stormwater Management

Stormwater Permit Program, RCW 90.48.260; 40 CFR 122.26; Chapter 173-226 WAC

Waste Management

Washington Solid Waste Management Act and Solid Waste Management Handling Standards Regulations, Chapter 70.95 RCW, Chapter 173-350 WAC.

Resource Conservation and Recovery Act: 42 USC 6901

Dangerous Waste Act and Regulations,: RCW 70.105; Chapter 173-303 WAC

Action-specific ARARs, Continued

Toxic Substances Control Act, 15 U.S.C. §2601 et seq. 40 CFR 761.61

Regulation and Licensing of Well Contractors and Operators, Chapter 18.104 RCW; WAC 173-162-020, -030

General Regulations for Air Contaminant Source, Chapter 70.94 RCW; WAC 173-400-040(8); Puget Sound Clean Air Agency (PSCAA) Regulation 1, Section 9.15.

Local requirements

Washington State Shoreline Management Act and City of Everett Shoreline Master Program (SMP), RCW 90.58, WAC 173-27-060, City of Everett Ordinance 3053-08 and SMP.

City of Everett Stormwater and Storm Drainage, Ordinance 2196-96, amending Title 14.28, Effective February 15, 2010; City of Everett Stormwater Management Manual, dated February 2010.

City of Everett Grading Code, Title 18.28.200 EMC.

City of Everett Traffic Code, Title 46 EMC.

City of Everett Discharge to POTW Title 14.40 EMC.

State Environmental Policy Act

The State Environmental Policy Act (SEPA) (Chapter 43.21C RCW; Chapter 197-11WAC) and the SEPA procedures (Chapter 173-802 WAC)

Table 9-1
Identification and Screening of Remedial Technologies
Everett Shipyard
Everett, Washington
RI/FS

General Response Actions	Remedial Technology Type	Screening Results
No Action	None	Not retained. This response action will not meet MTCA threshold requirements
Institutional Controls/ Long-Term Monitoring	• Environmental Covenants/Notifications • Environmental Monitoring of Ecological Receptors • Physical Controls	Retained. If selected, this response action must be used in conjunction with other active remedies such as capping and/or excavation
Monitored Natural Attenuation	• Monitored Natural Attenuation for Upland Soils	Not retained. This response action will not meet MTCA threshold requirements.
Containment	• Capping of Upland Soils with Asphalt • Capping of Upland Soils with HDPE in existing buildings with wood floors	Retained
In Situ Treatment	• Biological Treatment (e.g., Bioremediation) • Chemical Treatment (e.g., *In Situ* Solidification/Stabilization) • Thermal Treatment (e.g., Steam Injection)	Not retained because this response action is not applicable for COCs at the Site
Ex-Situ Treatment	• Biological Treatment (e.g., Land Farming) • Chemical Treatment (e.g., Ex-Situ Solidification/Stabilization) • Thermal Treatment (e.g., Incineration)	Not retained because this response action is not applicable for COCs at the Site
Hydraulic Control	• Groundwater pump-and-treat	Not retained because this response action is not applicable to the media of concern at the Site
Removal/Disposal	• Excavation with Offsite Landfill Disposal	Retained.

Table 9-2
Identification and Screening of Marine Sediment Remedial Technologies
Everett Shipyard
Everett, Washington
RI/FS

General Response Actions	Remedial Technology Type	Screening Results
No Action	None	Not retained. This response action will not meet MTCA threshold requirements
Institutional Controls/ Long-Term Monitoring	• Environmental Covenants/Notifications • Environmental Monitoring of Ecological Receptors • Physical Controls	Retained. If selected, this response action must be used in conjunction with other active remedies such as capping and/or dredging
Monitored Natural Recovery	• Monitored Natural Recovery • Enhanced Natural Recovery	Retained. If selected, this response action must be used with other active remedies.
Containment	• Capping of Marine Sediment	Retained
In Situ Treatment	• Porewater Treatment through a Pre-Cap Layer (e.g. Organoclay-based binding through adsorption)	Retained for use with other active remedies such as capping.
Ex-Situ Treatment for Dewatered Sediments	• Biological Treatment (e.g., Land Farming) • Chemical Treatment (e.g., Ex-Situ Solidification/Stabilization) • Thermal Treatment (e.g., Incineration)	Not retained because this response action is not applicable for COCs at the Site
Dredging/Offsite Disposal	• Mechanical dredging using clam shell or enclosed bucket (e.g., Cable Arm) • Hydraulic dredging	Retained

Table 10-1
Summary of MTCA Cleanup Alternative Evaluation and DCA Results for Upland Soils
Everett Shipyard
Everett, Washington
RI/FS

Alternative		**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Probable Cost (Thousand $)[1]		**$1,800**	**$2,700**	**$5,400**	**$3,800**
Description		Targeted/limited excavation of PCB-impacted soil above remediation level of 10,000 µg/kg; excavation of petroleum hydrocarbon-impacted bulkhead soil; installation of engineered-cap in remaining areas above preliminary cleanup levels; institutional controls; and long-term monitoring	Excavation of contaminated soil not covered by existing pavement and buildings; excavation of petroleum hydrocarbon-impacted bulkhead soil; installation of engineered cap on remaining contaminated soil with existing structures or pavement; institutional controls; and long term monitoring	Removal of all contaminated soil, except for limited contaminated soil within the West Marine Drive right-of-way; capping of contaminated soil within the West Marine View Drive right-of-way with a concrete walkway, soil cover (landscaping strip), and asphalt pavement (if contamination extends into the roadway); institutional controls; and long-term monitoring	Bulk excavation of all contaminated soil within 150 to 250 feet of the North Marina Shoreline and all of the soil within the Everett Shipyard operations yard including western part of Former Fish Processing storage building with building demolition (Everett Engineering Bldgs 7 & 9); installation of engineered cap on remaining contaminated soil beneath existing structures and pavement; institutional controls; and long term monitoring.
Total Volume of Impacted Soil Excavation (Cubic Yards)		**1,300**	**9,400**	**18,800**	**14,800**
Contaminant Mass Removal (Percent, Estimated)	**Arsenic**	2.6%	74%	97%	96%
	Lead	7.8%	59%	98%	93%
	Diesel	48%	85%	>99%	>99%
	Oil Range	1.7%	41%	>99%	99%
	cPAHs	3.0%	61%	98%	90%
	PCBs	58%	92%	>99%	99%
	WEIGHTED TOTAL	**15%**	**56%**	**99%**	**98%**
Basis for Alternative Ranking under MTCA and Cost/Benefit					
1. Compliance with MTCA Threshold Criteria [WAC 173-340-360(2)(a)]		Yes [(2)]	Yes [(2)]	Yes [(3)]	Yes [(3)]

Table 10-1
Summary of MTCA Cleanup Alternative Evaluation and DCA Results for Upland Soils
Everett Shipyard
Everett, Washington
RI/FS

Alternative		**Alternative 1**		**Alternative 2**		**Alternative 3**		**Alternative 4**	
2. Reasonable Restoration Timeframe? [WAC 173-340-360(4)]		Either unknown or uncertain		Either unknown or uncertain		~ 2 to 3 years		Within 2 to 3 years, 98% of contaminant mass can be removed and the residual risks from residual upland soil contamination would be appropriately managed along with future site redevelopment within a resonable time period.	
3. DCA & Relative Benefits Ranking Calculation [WAC 173-340-360(3)(f)]									
Criteria	**Weighting Factor**	**Raw Score**	**Weighted Score**	**Raw Score**	**Weighted Score**	**Raw Score**	**Weighted Score**	**Raw Score**	**Weighted Score**
Overall Protectiveness	30%	1	0.3	2	0.6	10	3	8	2.4
Permanence	20%	1	0.2	5	1	10	2	9	1.8
Effectiveness over the long-term	20%	1	0.2	5	1	10	2	8	1.6
Management of short-term risks	10%	10	1	9	0.9	7	0.7	8	0.8
Technical and Administrative Implementability	10%	7	0.7	8	0.8	10	1	9	0.9
Consideration of Public Concerns	10%	4	0.4	4	0.4	10	1	8	0.8
Composite Totals			2.8		4.7		9.7		8.3
Overall Weighted Benefit Score		2.8		4.7		9.7		8.3	
Overall Alternative Benefit Ranking		4 (Least Beneficial)		3		1 (Most Beneficial)		2	
4. Ratio of Cost/Benefit		**643**		**574**		**557**		**458**	
Unit Cost per CY of Impacted Soil Removal ($/CY)		**$1,385**		**$287**		**$287**		**$257**	
5. Decision:									
Is the alternative "permanent to maximum extent practicable?"		No		No		No		Yes	
Is the alternative's cost disproportionate to its incremental benefits?		Yes		Yes		Yes		No	

Notes
Refer to Section 10.1 for the rationale for assigning these raw scores to each criteria.
1. Probable Cost = Total Project Present Worth (see Tables 10-2 through 10-5).
2. Alternatives 1 and 2 may not fully comply with MTCA threshold criteria because of the uncertainties associated with leaving relatively large percentages of contaminant mass beneath the engineered cap combined with the uncertainties associated with future site redevelopment.
3. Risks associated with the residual soil contamination after excavation are sufficiently reduced to allow for effective management via engineering and institutional controls.

Table 10-2
Cost Estimate for Uplands Alternative 1:
Limited Excavation and Engineered Cap
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$20,000	LS	1	$20,000
Contractor Work Plans	$10,000	LS	1	$10,000
1A.1. OPERATIONS AND ADJACENT AREAS				
Site Preparation/Demolition				
Temporary Erosion Control Measures	$4.50	LF	1,600	$7,200
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,000	$2,500
Demo and Remove Concrete in Excavation Area	$5.00	SF	3,300	$16,500
Remove Skids	$2,000	DAY	4	$8,000
Asphalt/Concrete Transportation and Disposal	$20	TON	500	$10,000
Weathered Treated Wood Disposal (Skids)	$43.50	TON	25	$1,088
Excavation and Offsite Disposal				
Excavate and Load Hazardous Soil (PCB-Impacted)	$15	CY	240	$3,600
Excavate and Load Non-Hazardous Soil	$12	CY	400	$4,800
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	680	$2,380
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	680	$26,180
Offsite HW Transportation (Trucking)	$61	TON	408	$24,888
Offsite HW Stabilization, Landfill Disposal, and Taxes	$154	TON	408	$62,832
Import Clean Fill	$18	CY	640	$11,520
Backfill and Compaction	$6	CY	640	$3,840
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	18	$1,800
Bottom Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	8	$5,443
Sidewall Extent Analytical (PCBs)	$167	EA	10	$1,674
Engineered Cap (Containment)				
Import Clean Fill to Raise Grade	$18	CY	1,800	$32,400
Rough/Fine Grading and Compaction	$0.82	SF	58,000	$47,431
Base Course Gravel Import	$30	CY	1,500	$45,000
Place New Asphalt Pavement (3-inches thick)	$2.50	SF	58,000	$145,000
Stormwater Improvements	$25,000	LS	1	$25,000
Asphalt Overlay of Existing Paved Surfaces	$1.25	SF	55,000	$68,750
Apply Asphalt Seal Coat to Entire Paved Surface	$0.30	SF	113,000	$33,900
HDPE Liner to Cover Unpaved Floors	$2.50	SF	3,000	$7,500
Stormwater System Cleaning	$3,500	DAY	3	$10,500
Two Years Groundwater Monitoring	$4,500	EA	8	$36,000
1A.2. BULKHEAD AREA				
Temporary Erosion Control Measures	$4.50	LF	300	$1,350
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,900	$4,750
Asphalt/Concrete Transportation and Disposal	$20	TON	70	$1,400
Dewatering	$30,000	LS	1	$30,000
Shoring	$45	SF	1,200	$54,000
Excavate and Load Non-Hazardous Bulkhead Soil at Low Tide	$16	CY	1,000	$16,000
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	1,134	$3,969
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	1,134	$43,655
Import Clean Fill	$18	CY	667	$12,006
Backfill and Compaction	$6	CY	1,000	$6,000
Base Course Gravel Import for Bulkhead Excavation Area	$30	CY	62	$1,860
Place New Asphalt Pavement in Bulkhead Area	$2.50	SF	2,000	$5,000
Confirmation/Backfill Analytical (TPH-Dx) and Supplies	$200	EA	15	$3,000
Installation of 1 New Groundwater Monitoring Well	$3,700	EA	1	$3,700
Two Years Groundwater Monitoring	$1,500	EA	8	$12,000
1A.3. SITE RESTORATION				
Hyrdroseed/Grass	$2,500	AC	0.5	$1,250
SUBTOTAL CAPITAL COSTS				$875,666
Contingency/Unlisted Items		%	20	$175,133
TOTAL CAPITAL DIRECT COSTS				$1,050,000

Table 10-2
Cost Estimate for Uplands Alternative 1:
Limited Excavation and Engineered Cap
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1B. CAPITAL INDIRECT COSTS				
Design	DC	%	10	$105,000
Permitting and Regulatory Compliance	DC	%	5	$52,500
Ecology Oversight	DC	%	5	$52,500
Construction QA and Management	DC	%	12	$126,000
Closure Documentation	DC	%	4	$42,000
Combined Sales Tax for Everett, Washington	DC	%	9.2	$96,600
TOTAL CAPITAL INDIRECT COSTS				$475,000
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$1,525,000
TOTAL CAPITAL COSTS				**$1,500,000**
2. PERIODIC COSTS				
Mobilization/Demobilization	$800	LS	1	$800
Cap Inspection/Maintenance Costs				
Project Management/Inspection	$1,500	YR	5	$7,500
Asphalt Seal Coat	$0.30	SF	113,000	$33,900
Ecology Oversight Costs	$5,000	LS	1	$5,000
5-Year Reporting	$7,500	LS	1	$7,500
SUBTOTAL PERIODIC COSTS				**$54,700**
Combined Sales Tax for Everett, Washington	DC	%	9.2	$5,032
Contingency Allowances	DC	%	20	$10,940
Site Inspection and Overhead Costs	DC	%	8	$4,376
TOTAL PERIODIC COST PER EVENT				**$75,000**
Cost Projection for 30 years (Years 5, 10, 15, 20, 25, 30)				**$450,000**
30-Year Present Worth Periodic Cost*				**$290,000**
TOTAL CAPITAL COSTS				**$1,500,000**
TOTAL PERIODIC COSTS (30 YEARS)				**$450,000**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$2,000,000**
PRESENT WORTH PERIODIC COSTS*				**$290,000**
TOTAL PROJECT PRESENT WORTH*				**$1,800,000**

* Present worth costs were calculated using a 2.7% discount rate.
Note that total costs are rounded to two significant figures, which in most cases is to the nearest $100,000

Notes:
CY - cubic yard
DC - direct cost
EA - each
HR - hour
HW - hazardous waste
LS - lump sum
QA - quality assurance
SF - square foot
SY - square yard
YR - year

Table 10-3
Cost Estimate for Uplands Alternative 2:
Excavation of Unpaved Areas, Engineered Cap and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$40,000	LS	1	$40,000
Contractor Work Plans	$15,000	LS	1	$15,000
1A.1. OPERATIONS AND ADJACENT AREAS				
Site Preparation/Demolition				
Temporary Erosion Control Measures	$4.50	LF	1,600	$7,200
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,000	$2,500
Demo and Remove Concrete in Excavation Area	$5.00	SF	3,300	$16,500
Remove Skids	$2,000	DAY	6	$12,000
Asphalt/Concrete Transportation and Disposal	$20	TON	650	$13,000
Weathered Treated Wood Disposal (Skids)	$43.50	TON	25	$1,088
Excavation and Offsite Disposal				
Excavate and Load Hazardous Soil (PCB-Impacted)	$15	CY	240	$3,600
Excavate and Load Non-Hazardous Soil	$12	CY	8,500	$102,000
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	14,450	$50,575
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	14,450	$556,325
Offsite HW Transportation (Trucking)	$61	TON	408	$24,888
Offsite HW Stabilization, Landfill Disposal, and Taxes	$154	TON	408	$62,832
Import Clean Fill	$18	CY	8,700	$156,600
Backfill and Compaction	$6	CY	8,700	$52,200
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	105	$10,500
Bottom Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	60	$40,824
Sidewall Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	45	$30,618
Engineered Cap (Containment)				
Asphalt Overlay of Existing Paved Surfaces	$1.25	SF	55,000	$68,750
Apply Asphalt Seal Coat to Entire Paved Surface	$0.30	SF	55,000	$16,500
HDPE Liner to Cover Unpaved Floors	$2.50	SF	3,000	$7,500
Stormwater System Cleaning	$3,500	DAY	3	$10,500
Two Years Groundwater Monitoring	$4,500	EA	8	$36,000
1A.2. BULKHEAD AREA				
Temporary Erosion Control Measures	$4.50	LF	300	$1,350
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,900	$4,750
Asphalt/Concrete Transportation and Disposal	$20	TON	70	$1,400
Dewatering	$30,000	LS	1	$30,000
Shoring	$45	SF	1,200	$54,000
Excavate and Load Non-Hazardous Bulkhead Soil at Low Tide	$16	CY	1,000	$16,000
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	1,134	$3,969
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	1,134	$43,655
Import Clean Fill	$18	CY	667	$12,006
Backfill and Compaction	$6	CY	1,000	$6,000
Base Course Gravel Import for Bulkhead Excavation Area	$30	CY	62	$1,860
Place New Asphalt Pavement in Bulkhead Area	$2.50	SF	2,000	$5,000
Confirmation/Backfill Analytical (TPH-Dx) and Supplies	$200	EA	15	$3,000
Installation of 1 New Groundwater Monitoring Well	$3,700	EA	1	$3,700
Two Years Groundwater Monitoring	$1,500	EA	8	$12,000
1A.3. SITE RESTORATION				
Hyrdroseed/Grass	$2,500	AC	1.5	$3,750
SUBTOTAL CAPITAL COSTS				$1,539,939
Contingency/Unlisted Items		%	20	$307,988
TOTAL CAPITAL DIRECT COSTS				$1,850,000

Table 10-3
Cost Estimate for Uplands Alternative 2:
Excavation of Unpaved Areas, Engineered Cap and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1B. CAPITAL INDIRECT COSTS				
Design	DC	%	8	$148,000
Permitting and Regulatory Compliance	DC	%	4	$74,000
Ecology Oversight	DC	%	4	$74,000
Construction QA and Management	DC	%	8	$148,000
Closure Documentation	DC	%	3	$55,500
Combined Sales Tax for Everett, Washington	DC	%	9.2	$170,200
TOTAL CAPITAL INDIRECT COSTS				$670,000
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$2,520,000
TOTAL CAPITAL COSTS				**$2,500,000**
2. PERIODIC COSTS				
Mobilization/Demobilization	$800	LS	1	$800
Cap Inspection/Maintenance Costs				
Project Management/Inspection	$1,500	YR	5	$7,500
Asphalt Seal Coat	$0.30	SF	55,000	$16,500
Ecology Oversight Costs	$5,000	LS	1	$5,000
5-Year Reporting	$7,500	LS	1	$7,500
SUBTOTAL PERIODIC COSTS				**$37,300**
Combined Sales Tax for Everett, Washington	DC	%	9.2	$3,432
Contingency Allowances	DC	%	20	$7,460
Site Inspection and Overhead Costs	DC	%	8	$2,984
TOTAL PERIODIC COST PER EVENT				**$51,000**
Cost Projection for 30 years (Years 5, 10, 15, 20, 25, 30)				**$310,000**
30-Year Present Worth Periodic Cost*				**$200,000**
TOTAL CAPITAL COSTS				**$2,500,000**
TOTAL PERIODIC COSTS (30 YEARS)				**$310,000**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$2,800,000**
PRESENT WORTH PERIODIC COSTS*				**$200,000**
TOTAL PROJECT PRESENT WORTH*				**$2,700,000**

* Present worth costs were calculated using a 2.7% discount rate.

Note that total costs are rounded to two significant figures, which in most cases is to the nearest $100,000

Notes:
CY - cubic yard
DC - direct cost
EA - each
HR - hour
HW - hazardous waste
LS - lump sum
QA - quality assurance
SF - square foot
SY - square yard
YR - year

Table 10-4
Cost Estimate for Uplands Alternative 3:
Building Demolition, Mass Excavation and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$55,000	LS	1	$55,000
Contractor Work Plans	$20,000	LS	1	$20,000
1A.1. OPERATIONS AND ADJACENT AREAS				
Site Preparation/Demolition				
Building Demolition/Disposal				
Hazardous Materials Abatement	$40,000	LS	1	$40,000
Demo Buildings (Excludes Floors, Includes Dust Control)	$8,200	DAY	20	$164,000
Demo Concrete Floors of Buildings	$4.50	SF	54,000	$243,000
Building Concrete Transportation and Disposal	$20	TON	5,500	$110,000
Construction Debris Transportation and Disposal	$43.50	TON	1,200	$52,200
Disposal of Hazardous Building Materials	$30,000	LS	1	$30,000
Other Demolition/Disposal (Excludes Building Demolition)				
Temporary Erosion Control Measures	$4.50	LF	1,900	$8,550
Asphalt/Concrete Pavement Demolition	$2.00	SF	55,000	$110,000
Remove Skids	$2,000	DAY	6	$12,000
Asphalt/Concrete Transportation and Disposal	$20	TON	3,000	$60,000
Weathered Treated Wood Disposal (Skids)	$43.50	TON	25	$1,088
Excavation and Offsite Disposal				
Excavate and Load Hazardous Soil (PCB-Impacted)	$15	CY	240	$3,600
Excavate and Load Non-Hazardous Soil	$12	CY	17,900	$214,800
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	30,430	$106,505
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	30,430	$1,171,555
Offsite HW Transportation (Trucking)	$61	TON	408	$24,888
Offsite HW Stabilization, Landfill Disposal, and Taxes	$154	TON	408	$62,832
Import Clean Fill	$18	CY	18,100	$325,800
Backfill and Compaction	$6	CY	18,100	$108,600
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	210	$21,000
Bottom Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	130	$88,452
Sidewall Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	80	$54,432
Stormwater System Cleaning for Remaining Lines	$3,500	DAY	1	$3,500
Installation of 3 New Groundwater Monitoring Wells	$3,700	EA	3	$11,100
Two Years Groundwater Monitoring	$4,500	EA	8	$36,000
1A.2. BULKHEAD AREA				
Temporary Erosion Control Measures	$4.50	LF	300	$1,350
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,900	$4,750
Asphalt/Concrete Transportation and Disposal	$20	TON	70	$1,400
Dewatering	$30,000	LS	1	$30,000
Shoring	$45	SF	1,200	$54,000
Excavate and Load Non-Hazardous Bulkhead Soil at Low Tide	$16	CY	1,000	$16,000
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	1,134	$3,969
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	1,134	$43,655
Import Clean Fill	$18	CY	667	$12,006
Backfill and Compaction	$6	CY	1,000	$6,000
Base Course Gravel Import for Bulkhead Excavation Area	$30	CY	62	$1,860
Place New Asphalt Pavement in Bulkhead Area	$2.50	SF	2,000	$5,000
Confirmation/Backfill Analytical (TPH-Dx) and Supplies	$200	EA	15	$3,000
Installation of 1 New Groundwater Monitoring Well	$3,700	EA	1	$3,700
Two Years Groundwater Monitoring	$1,500	EA	8	$12,000
1A.3. SITE RESTORATION				
Base Course Gravel Import for Area Adjacent to Marina	$30	CY	80	$2,400
Place New Asphalt Pavement Adjacent to Marina	$2.50	SF	2,500	$6,250
Hyrdroseed/Grass	$2,500	AC	3.5	$8,750
SUBTOTAL CAPITAL COSTS				$3,354,991

Table 10-4
Cost Estimate for Uplands Alternative 3:
Building Demolition, Mass Excavation and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
Contingency/Unlisted Items		%	20	$670,998
TOTAL CAPITAL DIRECT COSTS				$4,030,000
1B. CAPITAL INDIRECT COSTS				
Hazardous Materials Building Surveys	$25,000	LS	1	$25,000
Design	DC	%	5	$201,500
Permitting and Regulatory Compliance	DC	%	3	$120,900
Ecology Oversight	DC	%	4	$161,200
Construction QA and Management	DC	%	7	$282,100
Closure Documentation	DC	%	3	$120,900
Combined Sales Tax for Everett, Washington	DC	%	9.2	$370,760
TOTAL CAPITAL INDIRECT COSTS				$1,280,000
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$5,310,000
TOTAL CAPITAL COSTS				**$5,300,000**
2. PERIODIC COSTS				
Mobilization/Demobilization	$800	LS	1	$800
Project Management/Inspection	$1,500	YR	1	$1,500
Ecology Oversight Costs	$5,000	LS	1	$5,000
5-Year Reporting	$7,500	LS	1	$7,500
SUBTOTAL PERIODIC COSTS				**$14,800**
Combined Sales Tax for Everett, Washington	DC	%	9.2	$1,362
Contingency Allowances	DC	%	20	$2,960
Site Inspection and Overhead Costs	DC	%	8	$1,184
TOTAL PERIODIC COST PER EVENT				**$20,300**
Cost Projection for 30 years (Years 5, 10, 15, 20, 25, 30)				**$120,000**
30-Year Present Worth Periodic Cost*				**$78,000**
TOTAL CAPITAL COSTS				**$5,300,000**
TOTAL PERIODIC COSTS (30 YEARS)				**$120,000**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$5,400,000**
PRESENT WORTH PERIODIC COSTS*				**$78,000**
TOTAL PROJECT PRESENT WORTH*				**$5,400,000**

* Present worth costs were calculated using a 2.7% discount rate.

Note that total costs are rounded to two significant figures, which in most cases is to the nearest $100,000

Notes:
CY - cubic yard
DC - direct cost
EA - each
HR - hour
HW - hazardous waste
LS - lump sum
QA - quality assurance
SF - square foot
SY - square yard
YR - year

Table 10-5
Cost Estimate for Uplands Alternative 4:
Bulk Excavation, Engineered Cap and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$40,000	LS	1	$40,000
Contractor Work Plans	$15,000	LS	1	$15,000
1A.1. OPERATIONS AND ADJACENT AREAS				
Site Preparation/Demolition				
Building Demolition/Disposal				
Hazardous Materials Abatement	$8,800	LS	1	$8,800
Demo Buildings (Excludes Floors, Includes Dust Control)	$8,200	DAY	4	$32,800
Demo Concrete Floors of Buildings	$4.50	SF	12,000	$54,000
Building Concrete Transportation and Disposal	$20	TON	1,215	$24,300
Construction Debris Transportation and Disposal	$43.50	TON	265	$11,528
Disposal of Hazardous Building Materials	$6,600	LS	1	$6,600
Other Demolition/Disposal (Excludes Building Demolitior				
Temporary Erosion Control Measures	$4.50	LF	1,600	$7,200
Demo and Remove Asphalt in Excavation Area	$2.50	SF	42,500	$106,250
Demo and Remove Concrete in Excavation Area	$5.00	SF	3,300	$16,500
Remove Skids	$2,000	DAY	6	$12,000
Asphalt/Concrete Transportation and Disposal	$20	TON	1,700	$34,000
Weathered Treated Wood Disposal (Skids)	$43.50	TON	25	$1,088
Excavation and Offsite Disposal				
Excavate and Load Hazardous Soil (PCB-Impacted)	$15	CY	240	$3,600
Excavate and Load Non-Hazardous Soil	$12	CY	13,900	$166,800
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	23,630	$82,705
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	23,630	$909,755
Offsite HW Transportation (Trucking)	$61	TON	408	$24,888
Offsite HW Stabilization, Landfill Disposal, and Taxes	$154	TON	408	$62,832
Import Clean Fill	$18	CY	14,140	$254,520
Backfill and Compaction	$6	CY	14,140	$84,840
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	157	$15,700
Bottom Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	80	$54,432
Sidewall Extent Analytical (PCBs, Metals, CPAHs, TPH-Dx)	$680	EA	77	$52,391
Engineered Cap (Containment)				
Asphalt Overlay of Existing Paved Surfaces	$1.25	SF	4,500	$5,625
Apply Asphalt Seal Coat to Entire Paved Surface	$0.30	SF	4,500	$1,350
HDPE Liner to Cover Unpaved Floors	$2.50	SF	3,000	$7,500
Stormwater System Cleaning	$3,500	DAY	3	$10,500
Two Years Groundwater Monitoring	$4,500	EA	8	$36,000
1A.2. BULKHEAD AREA				
Temporary Erosion Control Measures	$4.50	LF	300	$1,350
Demo and Remove Asphalt in Excavation Area	$2.50	SF	1,900	$4,750
Asphalt/Concrete Transportation and Disposal	$20	TON	70	$1,400
Dewatering	$30,000	LS	1	$30,000
Shoring	$45	SF	1,200	$54,000
Excavate and Load Non-Hazardous Bulkhead Soil at Low Tide	$16	CY	1,000	$16,000
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	1,134	$3,969
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	1,134	$43,655
Import Clean Fill	$18	CY	667	$12,006
Backfill and Compaction	$6	CY	1,000	$6,000
Base Course Gravel Import for Bulkhead Excavation Area	$30	CY	62	$1,860
Place New Asphalt Pavement in Bulkhead Area	$2.50	SF	2,000	$5,000

Table 10-5
Cost Estimate for Uplands Alternative 4:
Bulk Excavation, Engineered Cap and Institutional Controls
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
Confirmation/Backfill Analytical (TPH-Dx) and Supplies	$200	EA	15	$3,000
Installation of 1 New Groundwater Monitoring Well	$3,700	EA	1	$3,700
Two Years Groundwater Monitoring	$1,500	EA	8	$12,000
1A.3. SITE RESTORATION				
Hyrdroseed/Grass	$2,500	AC	3	$7,500
SUBTOTAL CAPITAL COSTS				$2,349,693
Contingency/Unlisted Items		%	20	$469,939
TOTAL CAPITAL DIRECT COSTS				$2,820,000
1B. CAPITAL INDIRECT COSTS				
Hazardous Materials Building Surveys	$25,000	LS	0.23	$5,750
Design	DC	%	6	$169,200
Permitting and Regulatory Compliance	DC	%	3	$84,600
Ecology Oversight	DC	%	4	$112,800
Construction QA and Management	DC	%	7	$197,400
Closure Documentation	DC	%	3	$84,600
Combined Sales Tax for Everett, Washington	DC	%	9.2	$259,440
TOTAL CAPITAL INDIRECT COSTS				$914,000
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$3,734,000
TOTAL CAPITAL COSTS				**$3,700,000**
2. PERIODIC COSTS				
Mobilization/Demobilization	$800	LS	1	$800
Project Management/Inspection	$1,500	YR	5	$7,500
Asphalt Seal Coat	$0.30	SF	4,500	$1,350
Ecology Oversight Costs	$5,000	LS	1	$5,000
5-Year Reporting	$7,500	LS	1	$7,500
SUBTOTAL PERIODIC COSTS				**$22,150**
Combined Sales Tax for Everett, Washington	DC	%	9.2	$2,038
Contingency Allowances	DC	%	20	$4,430
Site Inspection and Overhead Costs	DC	%	8	$1,772
TOTAL PERIODIC COST PER EVENT				**$30,000**
Cost Projection for 30 years (Years 5, 10, 15, 20, 25, 30)				**$180,000**
30-Year Present Worth Periodic Cost*				**$116,000**
TOTAL CAPITAL COSTS				**$3,700,000**
TOTAL PERIODIC COSTS (30 YEARS)				**$180,000**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$3,900,000**
PRESENT WORTH PERIODIC COSTS*				**$116,000**
TOTAL PROJECT PRESENT WORTH*				**$3,800,000**

* Present worth costs were calculated using a 2.7% discount rate.

Note that total costs are rounded to two significant figures, which in most cases is to the nearest $100,000

Notes:
CY - cubic yard
DC - direct cost
EA - each
HR - hour
HW - hazardous waste
LS - lump sum
QA - quality assurance
SF - square foot
YR - year

Table 10-6
Future Contingency Costs for Upland Alternatives
Everett Shipyard
Everett, Washington
RI/FS

FUTURE CONTINGENCY COST: Soil Management Plan/Cleanup Cost when site redevelopment occurs[a]

Description	Units	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Residual Impacted Soil Volume	CY	17,500	9,400	0	4,000
Capital Direct Cleanup Cost/CY of Soil[b]	$/CY	$191	$191	$191	$191
Total Capital Unit Cleanup Cost/CY (Including Indirect Costs)[c]	$/CY	$248	$248	$248	$248
Contingency Cost Needed for Future Site Development in Year 2020[d]	$	$4,330,000	$2,330,000	$0	$990,000
Discount Rate	%	2.7%	2.7%	2.7%	2.7%
Assumed Time Until Redevelopment	YR	10	10	10	10
TOTAL CONTINGENCY COST FOR FUTURE SITE REDEVELOPMENT (Present Worth in 2010)		**$3,300,000**	**$1,800,000**	**$0**	**$760,000**

a - Redevelopment assumed to be in Year 2020 or 10 years from 2010
b - Derived from Alternative 4 (see Table 10-5): total capital direct costs/CY of soil removal = $2,820,000/14,800 CY
c - Capital Direct Cleanup Cost/CY of Soil increased by 30% to account for capital indirect costs for future cleanup
d - Contingency Cost Needed = (Total Capital Unit Cleanup Cost/CY) * (Residual Impacted Soil Volume)

Notes:
CY - cubic yards
YR - year

Table 10-7
Cost Estimate for Marine Sediment Alternative 1:
Targeted Dredging and Containment
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$55,000	LS	1	$55,000
Contractor Work Plans	$7,500	LS	1	$7,500
Marine Railway Demolition and Removal				
Demolition (in-water work)	$6,000	DAY	12	$72,000
Dismantling Railway for Disposal and Loading Trucks	$3,000	DAY	5	$15,000
Timber Disposal/Recycling and Transportation	$23.28	CY	120	$2,794
Steel Disposal/Recycling and Transportation	$43.50	TON	150	$6,525
Dredging of Contaminated Sediment				
Hydrographic Survey (Pre-Dredging)	$10,000	LS	1	$10,000
Silt Curtain/Sediment Control	$60,000	LS	1	$60,000
Dredge and Place on Barge	$6	CY	3,900	$23,400
Tow Barge to Transload Sediment	$9	CY	2,900	$26,100
Transload to Containers/Trucks	$10	CY	2,900	$29,000
Surface Water Monitoring	$250	DAY	12	$3,000
Hydrographic Survey (Post-Dredging)	$10,000	LS	1	$10,000
Transportation and Offsite Disposal				
Transportation to In-Water Disposal Location	$12	CY	1,000	$12,000
In-Water Disposal Fee	$2,000	LS	1	$2,000
Container Liners	$50	EA	197	$9,860
Load lined containers for disposal	$8	TON	4,930	$39,440
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	4,930	$17,255
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	4,930	$189,805
Washington State Refuse Tax	3.6	%	189,805	$6,833
Containment				
Place Reactive Capping Material	$25	TON	175	$4,375
Reactive Capping Material	$292	TON	145	$42,268
Insitu Treatment Amendment	$1,590	TON	30	$47,700
RC Material Shipping	$295	TON	175	$51,705
Import Armoring Material	$40	CY	185	$7,400
Place 6-Inch Armoring Layer	$30	CY	185	$5,550
Hydrographic Survey (Post-Capping)	$10,000	LS	1	$10,000
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	15	$1,500
Analytical (3-dy TAT Organics, Metals, TBT, PCBs)	$3,520	EA	15	$52,800
SUBTOTAL CAPITAL COSTS				$820,809
Contingency/Unlisted Items		%	25	$205,202
TOTAL CAPITAL DIRECT COSTS				$1,030,000
1B. CAPITAL INDIRECT COSTS				
Design	DC	%	16	$164,800
Permitting and Regulatory Compliance	DC	%	8	$82,400
Ecology Oversight	DC	%	4	$41,200
Construction QA and Management	DC	%	9	$92,700
Closure Documentation	DC	%	4	$41,200
Combined Sales Tax for Everett, Washington	DC	%	9.2	$94,760
TOTAL CAPITAL INDIRECT COSTS				$520,000

Table 10-7
Cost Estimate for Marine Sediment Alternative 1:
Targeted Dredging and Containment
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$1,550,000
Site Inspection and Overhead Costs	Total Costs	%	8	$124,000
TOTAL CAPITAL COSTS				**$1,700,000**
2. PERIODIC MONITORING COSTS				
Mobilization/Demobilization	$5,000	LS	1	$5,000
Porewater Sampling Costs				
Project Management/Coordination	$150	HR	24	$3,600
Field Labor	$2,000	DAY	4	$8,000
Charter Sampling Vessel	$1,600	DAY	2	$3,200
Sampling Supplies	$200	EA	5	$1,000
Analytical (Organics, Metals, Organotins, PCBs)	$1,435	EA	5	$7,175
Reporting	$5,000	LS	1	$5,000
Ecology Oversight	$5,000	LS	1	$5,000
Cap Maintenance Allowance	$15,000	LS	1	$15,000
SUBTOTAL MONITORING COSTS				**$52,975**
Combined Sales Tax for Everett, Washington	DC	%	9.2	$4,874
Contingency Allowances	DC	%	25	$13,244
Site Inspection and Overhead Costs	DC	%	8	$5,298
TOTAL MONITORING (PERIODIC) COST PER EVENT				**$76,000**
Cost Projection for 20 years (Years 1, 5, 10, 15, 20)				**$380,000**
20-Year Present Worth O&M*				**$290,000**
TOTAL CAPITAL COSTS				**$1,700,000**
TOTAL PERIODIC COSTS (20 YEARS)				**$380,000**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$2,100,000**
PRESENT WORTH PERIODIC COSTS*				**$290,000**
TOTAL PROJECT PRESENT WORTH*				**$2,000,000**

* Present worth costs were calculated using a 2.7% discount rate.

Notes:
CY - cubic yard
DC - direct cost
dy - day
EA - each
HR - hour
LS - lump sum
QA - quality assurance
SF - square foot
SY - square yard
TAT - turn around time
YR - year

Table 10-8
Cost Estimate for Marine Sediment Alternative 2:
Mass Dredging
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
1. CAPITAL COSTS				
1A. CAPITAL DIRECT COSTS (INSTALLED)				
Mobilization				
Mobilize/Demobilize	$50,000	LS	1	$50,000
Contractor Work Plans	$7,500	LS	1	$7,500
Marine Railway Demolition and Removal				
Demolition (in-water work)	$6,000	DAY	12	$72,000
Dismantling Railway for Disposal and Loading Trucks	$3,000	DAY	5	$15,000
Timber Disposal/Recycling and Transportation	$23.28	CY	120	$2,794
Steel Disposal/Recycling and Transportation	$43.50	TON	150	$6,525
Dredging of Contaminated Sediment				
Temporary Removal of Floating Docks (Pilings Not Removed)	$35,000	LS	1	$35,000
Hydrographic Survey (Pre-Dredging)	$10,000	LS	1	$10,000
Silt Curtain/Sediment Control	$60,000	LS	1	$60,000
Dredge and Place on Barge	$6	CY	3,200	$19,200
Limited Access Dredging	$24	CY	1,600	$38,400
Dewatering of Limited Access Dredged Sediments	$150,000	LS	1	$150,000
Tow Barge to Transload Sediment	$9	CY	2,200	$19,800
Transload to Containers/Trucks	$10	CY	3,800	$38,000
Surface Water Monitoring	$250	DAY	15	$3,750
Hydrographic Survey (Post-Dredging)	$10,000	LS	1	$10,000
Replace Floating Docks After Dredging	$40,000	LS	1	$40,000
Transportation and Offsite Upland Landfill Disposal				
Transportation to In-Water Disposal Location	$12	CY	1,000	$12,000
In-Water Disposal Fee	$2,000	LS	1	$2,000
Container Liners	$50	EA	258	$12,920
Load lined containers for disposal	$8	TON	6,460	$51,680
Trucking from Site to Rail-Loading Facility (Everett, WA)	$3.50	TON	6,460	$22,610
Offsite Non-HW Landfill Disposal and Rail Transportation	$38.50	TON	6,460	$248,710
Washington State Refuse Tax	3.6	%	248,710	$8,954
Confirmation Sampling				
Sample Supplies and Shipping	$100	EA	20	$2,000
Analytical (3-dy TAT Organics, Metals, TBT, PCBs)	$3,520	EA	20	$70,400
SUBTOTAL CAPITAL COSTS				$1,009,242
Contingency/Unlisted Items		%	25	$252,311
TOTAL CAPITAL DIRECT COSTS				$1,262,000
1B. CAPITAL INDIRECT COSTS				
Design	DC	%	16	$201,920
Permitting and Regulatory Compliance	DC	%	8	$100,960
Ecology Oversight	DC	%	3	$37,860
Construction QA and Management	DC	%	8	$100,960
Closure Documentation	DC	%	4	$50,480
Combined Sales Tax for Everett, Washington	DC	%	9.2	$116,104
TOTAL CAPITAL INDIRECT COSTS				$610,000
TOTAL DIRECT AND INDIRECT CAPITAL COSTS				$1,872,000
Site Inspection and Overhead Costs	Total Costs	%	8	$149,760
TOTAL CAPITAL COSTS				**$2,000,000**

Table 10-8
Cost Estimate for Marine Sediment Alternative 2:
Mass Dredging
Everett Shipyard
Everett, Washington
RI/FS

Item	Unit Cost	Units	Quantity	Cost
2. PERIODIC COSTS				**$0**
TOTAL CAPITAL COSTS				**$2,000,000**
TOTAL PERIODIC COSTS				**$0**
TOTAL CAPITAL AND PERIODIC COSTS (2010 DOLLARS)				**$2,000,000**
PRESENT WORTH PERIODIC COSTS*				**$0**
TOTAL PROJECT PRESENT WORTH*				**$2,000,000**

* Present worth costs were calculated using a 2.7% discount rate.

Notes:
CY - cubic yard
DC - direct cost
dy - day
EA - each
HR - hour
LS - lump sum
QA - quality assurance
SF - square foot
SY - square yard
TAT - turn around time
YR - year

Memo

URS

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To:	Jim Flynn, Project Manager	**Info:**	**FINAL**
From:	Jennifer Garner, Project Chemist	**Date:**	July 12, 2010
SUBJECT:	**Summary Data Quality Review** **Everett Shipyard RI/FS** **Sediment Sampling – May-June 2010**		

The summary data quality review of 33 sediment samples and 1 rinsate blank collected between May 19 and June 3, 2010 has been completed. The samples were collected by URS personnel and were analyzed at the Analytical Resources, Incorporated (ARI) laboratory in Tukwila, Washington for total petroleum hydrocarbons (TPHs, gasoline, diesel, and/or motor oil range) by Washington State Department of Ecology (Ecology) methods HCID (hydrocarbon identification) and/or NWTPH-Dx, volatile organic compounds (VOCs) by EPA Method 8260C, semivolatile organic compounds (SVOCs) by EPA Method 8270D, low-level polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270 modified for select ion monitoring (SIM), hexachlorobenzene and hexachlorobutadiene (HCB+HCBD) by EPA Method 8081, polychlorinated biphenyls (PCBs) by EPA Method 8082, bulk organotins and/or porewater organotins (tributyl tin ion, dibutyl tin ion, and butyl tin ion) by Krone (1988), total metals by EPA Methods 6010B (arsenic, cadmium, chromium, copper, lead, silver, and zinc) and 7471A (mercury), ammonia by EPA Method 350.1 modified, total sulfides by EPA Method 376.2, total solids and preserved total solids by EPA Method 160.3, total volatile solids (TVS) by EPA Method 160.4, and total organic carbon (TOC) by Plumb (1981) as described in Table 1. Select samples underwent grain size analysis; however, the results of the grain size analyses are presented in the laboratory data packages, but will not be discussed in this report. The chemical analyses were performed in general accordance with the methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846), Update IIIB*, June 2005 and *Methods for Chemical Analysis of Water and Wastes*, March 1983, Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997, *A Method for Analysis of Butlytin Species and the Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound*, Marine Environmental Research, 1988 (Krone), and *Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound*, PSEP, dated 1997. The laboratory provided summary data packages containing summarized sample results and associated QA/QC data for all samples. Samples were logged into ARI sample delivery groups (SDGs) QX39, QX48, QX76, QY34, QY09, QZ32, QZ34, RA03, and RA87.

Table 1 – Sample IDs and Requested Analyses

Sample ID	Laboratory ID	Requested Analyses
SG-45	QX39A	Conventionals
SG-44	QX39B	Conventionals
SG-41	QX39C	Conventionals
SG-42	QX39D	Conventionals
SG-39	QX39E	Conventionals
SG-38	QX39F	Conventionals
SG-36	QX39G	Conventionals
SG-37	QX39H	Conventionals
SG-40	QX39I	Conventionals

Table 1 – Sample IDs and Requested Analyses (continued)

Sample ID	Laboratory ID	Requested Analyses
SG-43	QX39J	Conventionals
SG-46	QX39K	Conventionals
SG-47	QX48A	Conventionals
BC-1-1	QX76A/QY09A/RA03A	HCID, NWTPH-Dx, VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-2-1	QX76B/QY09B	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-3-1	QX76C/QY09C	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-4-1	QX76D/QY09D/RA03B	HCID, NWTPH-Dx, VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-5-1	QX76E/QY09E	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-6-1	QX76F/QY09F	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-DUP-05212010 (Duplicate of BC-3-1)	QX76G/QY09G	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT, Metals, Conventionals
BC-1-2	QX76H/QZ32A/RA03D/RA87A	HCID, NWTPH-Dx, VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-2-2	QX76I/RA03C/RA87B	HCID, NWTPH-Dx, VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-3-2	QX76J/RA87C	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-4-2	QX76K/RA87D	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-5-2	QX76L/RA87E	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-6-2	QX76M/RA87F	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals, Conventionals
BC-ER-05212010 (Rinsate Blank)	QX76N	VOCs, SVOCs, Low-Level SVOCs, Pesticides, PCBs, TBT (bulk only), Metals
BC-7-1	QZ34A	HCID
BC-7-2	RA03E	NWTPH-Dx
BC-8-1	QZ34B	HCID
BC-8-2	RA03F	NWTPH-Dx
BC-9-1	QZ34C	HCID
BC-9-2	--	Hold
BC-10-1	QZ34D	HCID
BC-10-2	RA03G	NWTPH-Dx

Upon receipt by ARI, the sample jar information was compared to the associated chain-of-custody (COC) and the cooler temperatures were recorded. Three coolers were below the EPA-recommended temperature range of 4◦C±2◦C at 0.6◦C, 0.4◦C, and 1.4◦C. Data were not qualified based on the cooler temperatures. Several samples IDs were inconsistent between the sample labels on the sample jars and the COC. After review of the COC and field notes, URS confirmed sample IDs and the samples were reported correctly by the laboratory. The trip blank was not noted on the COC associated with SDGs QX76, QY09, RA03, and RA87. The laboratory analyzed the trip blank according to laboratory standard operating procedures and with concurrence from URS. All three trip blank vials submitted contained pea-sized air bubbles. Data were not qualified based on the presence of pea-bubbles in the trip blank vials.

Samples were frozen either upon receipt by the laboratory or immediately after the initial analyses commenced. Several samples were placed on hold for one or more analyses at the request of URS Corporation pending analytical results from other submitted samples. Analyses were authorized by URS Corporation on many of these samples and the results are presented in amended laboratory reports.

Data validation is based on method performance criteria and QC criteria documented in the Quality Assurance Project Plan (QAPP) of the *Final Remedial Investigation Feasibility Study Work Plan, Everett Shipyard, 1016-14th Street, Everett, Washington*, dated October 31, 2008 (RI/FS Work Plan). Hold times, field and method blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, field and laboratory duplicate results, blank spike recoveries (laboratory control samples), and reporting limits were reviewed to assess compliance with applicable methods. If data qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA documents *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review,* June 2008 and *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Data Review,* October 2004. A summary of data qualifiers assigned to these results is presented in Table 2.

Organic Analyses

Samples were analyzed for TPHs, VOCs, SVOCs, PAHs, HCB+HCBD, PCBs, and/or butyl tins (bulk and/or porewater) by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Blanks – Acceptable except as noted below:

   SVOCs by Method 8270D – Phenol (170 ug/kg) was detected in the method blank extracted on May 27, 2010. The concentrations for phenol in BC-1-1, BC-2-1, BC-3-1, BC-4-1, BC-6-1, and BC-DUP-05212010 were less than five times (5x) the method blank concentration; therefore, the results for phenol in these samples are qualified as not detected and flagged 'U' at the reported results.

   bis(2-Ethylhexyl)phthalate (3.2 ug/L) was detected in the rinsate blank. The concentrations for bis(2-ethylhexyl)phthalate in the associated samples were more than ten times (10x) the rinsate blank concentration; therefore, data were not qualified for this analyte based on the rinsate blank result.

   PAHs by Method 8270-SIM – Naphthalene (13 ug/kg), 2-methylnaphthalene (5.5 ug/kg), and phenanthrene (5.5 ug/kg) were detected in the method blank extracted on May 27, 2010. The concentrations for naphthalene in BC-4-1, BC-6-1, and BC-DUP-05212010 and 2-methylnaphthalene in BC-6-1 and BC-DUP-05212010 were less than 5x the method blank concentrations; therefore, the results for naphthalene and/or 2-methylnaphthalene in these samples are qualified as not detected and flagged 'U' at the reported results. Phenanthrene was not detected in the samples associated with this method blank and no qualification based on the method blank is required.

3. Surrogates – Acceptable except as noted below:

   HCID by NWTPH-HCID – o-Terphenyl was not recovered from BC-1-2. The percent recovery for o-terphenyl (129%) exceeded the control limits of 68-122% in the method blank extracted on June 4, 2010.

Data were not qualified based on the surrogate recovery in the method blank. BC-1-2 contained high concentrations of TPH; therefore, data were not qualified based on the non-recovery of the surrogate.

SVOCs by Method 8270D – The percent recoveries for one or more surrogates did not meet the control limits as noted below.

Sample ID	d5-NBZ (29-87%)	2-FBP (32-88%)	d14-TPH (21-97%)	d5-Phenol (29-85%)	2,4,6-TBP (25-103%)	d4-2-CP (30-84%)
BC-1-1 (DL)	ok	89.6%	101%	ok	ok	ok
BC-2-1	ok	ok	ok	ok	16.9%	ok
BC-2-1 (DL)	ok	95.2%	101%	ok	DO	ok
BC-3-1 (DL)	88.0%	99.2%	106%	91.7%	ok	87.5%
BC-4-1 (DL)	ok	94.4%	97.6%	89.6%	ok	ok
BC-5-1	ok	ok	99.2%	ok	ok	ok
BC-5-1 (DL)	ok	98.4%	ok	DO	ok	86.4%
BC-5-1 (MSD)	ok	ok	110%	89.6%	ok	ok

DL – Dilution
DO – Diluted out
2-FBP – 2-Fluorobiphenyl
d4-2-CP – d4-2-Chlorophenol
MSD – Matrix spike duplicate
NBZ – Nitrobenzene-d5
ok – Result acceptable
d14-TPH – d14-Terphenyl
2,4,6-TBP – 2,4,6-Tribromophenol

Data were not qualified based on surrogate recoveries in the matrix spike duplicate sample. Per CLP guidelines, SVOC results are qualified based on surrogate recoveries if two or more surrogates per fraction (base/neutral or acid) are outside the control limits. As only one surrogate was outside the control limits in BC-2-1and BC-5-1, data were not qualified based on the surrogate recoveries. The results for all base/neutral compounds reported from the dilutions of BC-1-1, BC-2-1, and BC-4-1 and all SVOCs reported from the dilution of BC-3-1 are qualified as estimated and flagged 'J' based on the elevated surrogate recoveries in these samples. Acid compounds were not reported from the dilution of BC-5-1; therefore, data were not qualified based on the surrogate recoveries in this sample.

PAHs by 8270-SIM – The percent recoveries for d14-dibenzo(a,h)anthracene exceeded the control limits of 10-117% in BC-4-1 (125%), BC-5-1 (127%), the dilution performed on BC-5-1 (120%), the matrix spike performed on BC-5-1 (132%), and the matrix spike duplicate performed on BC-5-1 (176%). Data were not qualified based on surrogate recoveries in the matrix spike and matrix spike duplicate samples. As only one surrogate was outside the control limits in these samples, data were not qualified based on the elevated surrogate recoveries.

HCB+HCBD by Method 8081 – The percent recoveries for decachlorobiphenyl (DCBP) and/or tetrachlorometaxylene (TCMX) were outside the control limits in several samples as noted below.

Sample ID	DCBP (65-125%)	TCMX (53-112%)
BC-1-1	172%	ok
BC-2-1(DL)	193%	ok
BC-3-1	162%	ok
BC-3-1(DL)	DO	DO
BC-4-1	143%	ok
BC-5-1	163%	ok
BC-5-1(MS)	170%	ok
BC-5-1(MSD)	153%	ok
BC-DUP-05212010	186%	114%
BC-DUP-05212010(DL)	DO	DO

DL – Dilution
DO – Diluted out
MS – Matrix spike
MSD – Matrix spike duplicate
ok – Result acceptable

Data were not qualified based on surrogate recoveries in the matrix spike and matrix spike duplicate samples. As only one of the two surrogates were outside the control limits, data were not qualified in BC-1-1, the dilution performed on BC-2-1, BC-3-1, BC-4-1, and BC-5-1 based on the elevated DCBP recoveries. As the surrogate recoveries in the full strength analysis of BC-3-1 were acceptable, data were not qualified based on the non-recoveries of surrogates in the dilution of this sample HCB and HCBD were not detected in BC-DUP-05212010; therefore, data were not qualified in this sample based on the surrogate recoveries.

PCBs by Method 8082 – The percent recoveries for decachlorobiphenyl (DCBP) and/or tetrachlorometaxylene (TCMX) were outside the control limits in several samples as noted below.

Sample ID	DCBP (59-122%)	TCMX (61-118%)
BC-1-1	NR	ok
BC-2-1	DO	DO
BC-DUP-05212010	DO	DO
BC-2-2	ok	54.2%
BC-3-2	ok	51.0%
BC-4-2	ok	56.0%
BC-5-2	ok	54.5%
Method Blank (6/21/10)	ok	58.2%
LCS (6/21/10)	ok	59.2%
LCSD (6/21/10)	ok	52.2%
BC-6-2	ok	59.2%
BC-6-2(MS)	ok	59.5%
BC-6-2(MSD)	ok	55.0%

DO – Diluted out MS – Matrix spike
MSD – Matrix spike duplicate NR – Not recovered
ok – Result acceptable

Data were not qualified based on surrogate recoveries in the quality control samples (method blank, LCS, LCSD, MS, and/or MSD). As only one of the two surrogates were outside the control limits in BC-1-1, BC-2-2, BC-3-2, BC-4-2, BC-5-2, and BC-6-2, data were not qualified based on the non-recovery or low recovery of the alternate surrogate. BC-2-1 and BC-DUP-05212010 required dilutions to quantitate high concentrations of PCBs present in these samples; therefore, data were not qualified based on the non-recoveries of surrogates in these samples.

Bulk Organotins by Krone – The percent recoveries for tripropyl tin chloride and/or tripentyl tin chloride were outside the control limits in several samples as noted below.

Sample ID	Tripropyl Tin Chloride (25-96%)	Tripentyl Tin Chloride (30-136%)
BC-1-1(DL)	DO	DO
BC-2-1(DL)	DO	DO
BC-3-1(DL)	DO	DO
BC-4-1(DL)	DO	DO
LCS (5/27/10)	ok	NR
BC-DUP-05212010(DL)	DO	DO

DL – Dilution DO – Diluted out LCS – Laboratory control sample
NR – Not recovered ok – Result acceptable

Data were not qualified based on surrogate recoveries in the LCS. As the percent recoveries for tripropyl tin chloride and tripentyl tin chloride were acceptable in the full-strength analyses of BC-1-1, BC-1-2, BC-1-3, BC-1-4, and BC-DUP-05212010, data were not qualified based on the surrogate results in the dilutions of these samples.

Porewater Organotins by Krone – The percent recoveries for tripropyl tin chloride and/or tripentyl tin chloride were outside the control limits in several samples as noted below.

Sample ID	Tripropyl Tin Chloride (36-107%)	Tripentyl Tin Chloride (58-120%)
BC-2-1(DL)	ok	DO
BC-3-1(DL)	DO	DO
Method blank (6/11/10)	ok	56.0%

DL – Dilution DO – Diluted out

Data were not qualified based on surrogate recoveries in the method blank. As the percent recoveries for tripropyl tin chloride and tripentyl tin chloride were acceptable in the full-strength analyses of BC-2-1 and BC-3-1, data were not qualified based on the surrogate results in the dilutions of these samples.

4. Laboratory Control/Laboratory Control Duplicate Samples (LCS/LCSD) – Acceptable except as noted below:

SVOCs by Method 8270D – The percent recoveries for phenol in the LCS (103%) and LCSD (120%) extracted on May 27, 2010 exceeded the control limits of 37-92%. The result for phenol in BC-5-1 is qualified as estimated and flagged 'J' based on the elevated percent recoveries in the LCS/LCSD. Phenol was not detected in the other samples associated with this LCS/LCSD and no further qualification is required.

Bulk Organotins by Krone – The percent recovery for dibutyl tin ion (DBT, 41.0%) in the LCSD and the relative percent difference (RPD, 31.6%) for the LCS/LCSD pair extracted on May 27, 2010 were outside 48-115% and 30%, respectively. The results for DBT in BC-1-1, BC-2-1, BC-3-1, BC-4-1, BC-5-1, BC-6-1, BC-DUP-05212010, BC-1-2, BC-2-2, BC-3-2, BC-4-2, BC-5-2, and BC-6-2 are qualified as estimated and flagged 'J' or 'UJ' based on the LCSD and RPD results.

5. Matrix Spike / Matrix Spike Duplicates (MS/MSD) – Acceptable except as noted below:

HCID by NWTPH-HCID – A MS/MSD was not performed in association with this analysis. Precision and accuracy were not assessed.

NWTPH-DX – A MS/MSD was performed on BC-1-1. Results were acceptable.

VOCs by Method 8260C – A MS/MSD was performed on BC-5-1. The percent recoveries for 1,2-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were outside the control limits as noted below.

Analyte	MS	MSD	Control Limits
1,2-Dichlorobenzene	46.8%	47.8%	80-124%
1,4-Dichlorobenzene	49.2%	50.9%	80-126%
1,2,4-Trichlorobenzene	17.4%	19.6%	76-140%

The results for 1,2-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene in BC-5-1 are qualified as estimated and flagged 'UJ' based on the MS/MSD results.

SVOCs by Method 8270D – MS/MSDs were performed on BC-5-1 and BC-2-2. The percent recoveries for one or more analytes were outside the control limits as noted below.

Sample ID	Analyte	MS	MSD	MS/MSD Control Limits	RPD	RPD Control Limits
BC-5-1	Phenol	ok	406%	37-92%	93.7%	30%
	Benzyl Alcohol	1.2%	ok	25-90%	45.8%	30%
	24-Dimethylphenol	ok	ok	23-85%	43.0%	30%
	Dimethylphthalate	NR	NR	44-91%	50.6%	30%
	Acenaphthylene	103%	85.4%	44-84%	ok	30%
	Acenaphthene	ok	111%	42-85%	34.6%	30%
	Dibenzofuran	ok	96.7%	46-84%	ok	30%
	Diethylphthalate	109%	118%	46-94%	ok	30%
	Fluorene	100%	149%	44-88%	31.1%	30%
	Pentachlorophenol	ok	NR	35-54%	135%	30%
	Phenanthrene	ok	192%	45-90%	50.9%	30%
	Anthracene	ok	174%	42-87%	51.9%	30%
	di-n-Butylphthalate	132%	136%	48-99%	ok	30%
	Fluoranthene	NR	NR	43-98%	56.9%	30%
	Pyrene	NR	NR	39-99%	52.5%	30%
	Butyl benzyl phthalate	19.7%	ok	41-105%	ok	30%
	Benzo(a)anthracene	NR	NR	42-94%	ok	30%
	bis(2-Ethylhexyl)phthalate	NR	NR	34-111%	44.4%	30%
	Chrysene	NR	NR	45-92%	ok	30%
	di-n-Octylphthalate	13.9%	17.7%	32-107%	ok	30%
	Benzo(b)fluoranthene	NR	NR	43-105%	33.1%	30%
	Benzo(k)fluoranthene	NR	NR	40-108%	33.1%	30%
	Benzo(a)pyrene	22.3%	118%	41-95%	ok	30%
	Indeno(1,2,3-c,d)pyrene	6.4%	ok	28-101%	55.3%	30%
	Dibenzo(a,h)anthracene	22.4%	ok	32-104%	46.0%	30%
	Benzo(g,h,i)perylene	0.1%	ok	18-106%	60.5%	30%
BC-2-2	Benzoic Acid	ok	23.1%	29-104%	89.6%	30%
	Fluoranthene	26.7%	31.2%	43-98%	ok	30%
	Pyrene	ok	37.9%	39-99%	ok	30%
	Chrysene	93.3%	ok	45-92%	33.5%	30%

ok – Result acceptable NR – Not recovered

The results for phenol and pentachlorophenol in BC-5-1 were qualified based on the associated LCS/LCSD results (Section 4) or the reporting limits (Section 7), and no further qualification for these analytes based on the MS/MSD is required. As the MS/MSD (2,4-dimethylphenol), MS/RPD (dibenzofuran), and MSD/RPD were acceptable for the MS/MSD performed on BC-5-1, data were not qualified for these analytes based on the MS, MSD, and/or RPD results. Diethylphthalate was not detected in BC-5-1; therefore, data were not qualified based on the elevated MS/MSD results. As the concentrations for dimethylphthalate, pyrene, bis(2-ethylhexyl)phthalate, chrysene, benzo(b)fluoranthene, and benzo(k)fluoranthene in BC-5-1 were more than four times (4x) the spike concentrations, data were not qualified for these analytes based on the MS/MSD/RPD results. The results for benzyl alcohol, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, di-n-butylphthalate, fluoranthene, benzo(a)anthracene, di-n-octylphthalate, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene are qualified as estimated and flagged ‘J’ based on the elevated MS/MSD/RPD results.

As the percent recovery in the MS and the RPD for the MS/MSD pair were acceptable, data were not qualified for pyrene in BC-2-2 based on the MSD result. The results for benzoic acid, fluoranthene, and chrysene in BC-2-2 are qualified as estimated and flagged ‘J’ or ‘UJ’ based on the MS/MSD/RPD results.

PAHs by Method 8270-SIM – MS/MSDs were performed on BC-5-1 and BC-5-2. The percent recoveries and/or RPDs for one or more analytes were outside the control limits as noted below.

Sample ID	Analyte	MS	MSD	MS/MSD Control Limits	RPD	RPD Control Limits
BC-5-1	Naphthalene	36.2%	ok	41-80%	ok	30%
	Acenaphthylene	ok	112.0%	44-84%	ok	30%
	Phenanthrene	NR	NR	45-90%	NC	30%
	Anthracene	NR	NR	42-87%	NC	30%
	Fluoranthene	NR	NR	43-98%	NC	30%
	Pyrene	NR	NR	39-99%	NC	30%
	Benzo(a)anthracene	NR	NR	42-94%	NC	30%
	Chrysene	NR	NR	45-92%	NC	30%
	Benzo(b)fluoranthene	NR	NR	43-105%	NC	30%
	Benzo(k)fluoranthene	NR	NR	40-108%	NC	30%
	Benzo(a)pyrene	NR	NR	41-95%	NC	30%
	Indeno(1,2,3-c,d)pyrene	NR	NR	28-101%	NC	30%
	Dibenzo(a,h)anthracene	NR	NR	32-104%	NC	30%
	Benzo(g,h,i)perylene	NR	NR	18-106%	NC	30%
	Dibenzofuran	29.7%	ok	46-84%	ok	30%
BC-5-2	Phenanthrene	101.0%	ok	45-90%	ok	30%
	Anthracene	91.6%	ok	42-87%	ok	30%

NC – Not calculable NR – Not recovered ok – Result acceptable

As the MS/RPD (acenaphthylene) and/or MSD/RPD (naphthalene and dibenzofuran) are acceptable for the MS/MSD performed on BC-5-1, data were not qualified for these analytes based on the MS/MSD results. The concentrations for phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene in BC-5-1 were more than 4x the spike concentrations; therefore, data were not qualified based on the non-recoveries in the MS and MSD.

As the MSD and RPD results were acceptable for the MS/MSD performed on BC-5-2, data were not qualified for these analytes based on the MS results.

HCB+HCBD by Method 8081 – MS/MSDs were performed on BC-5-1 and BC-3-2. Results were acceptable.

PCBs by Method 8082 – A MS/MSD was performed on BC-6-2. Results were acceptable.

A MS/MSD was performed on BC-5-1. The percent recoveries for Aroclor 1016 in the MS (117%) and MSD (116%) exceeded the control limits of 57-101%. Aroclor 1016 was not detected in BC-5-1; therefore, data were not qualified based on the elevated MS/MSD results.

Bulk Organotins by Krone – A MS/MSD was performed on BC-5-1. The percent recoveries and/or RPDs for tributyl tin, dibutyl tin ion, and butyl tin ion were outside the control limits as noted below.

Analyte	MS	MSD	MS/MSD Control Limits	RPD	RPD Control Limits
Tributyl Tin	NR	2,590%	59-143%	51.4%	30%
Dibutyl Tin Ion	NR	NR	48-115%	ok	30%
Butyl Tin Ion	NR	NR	20-113%	ok	30%

NR – Not recovered ok – Result acceptable

The concentrations for tributyl tin, dibutyl tin ion, and butyl tin ion in BC-5-1 were more than 4x the spike concentrations; therefore, data were not qualified for these analytes based on the MS/MSD results.

Porewater Organotins by Krone – A MS/MSD was performed on BC-5-1. Results were acceptable.

6. Field Duplicates

General – A field duplicate was collected for BC-1-3 and identified as BC-DUP-05212010. Results were comparable except as noted below.

Analysis	Analyte	RPD	RPD Control Limit
SVOCs by Method 8270D	Dimethylphthalate	51%	50%
	Acenaphthene	127%	50%
	Phenanthrene	74%	50%
	Fluoranthene	97%	50%
	Pyrene	104%	50%
	Butylbenzylphthalate	135%	50%
	Benzo(a)anthracene	63%	50%
	bis(2-Ethylhexyl)phthalate	127%	50%
	Di-n-Octy phthalate	70%	50%
	Benzo(b)fluoranthene	59%	50%
	Benzo(k)fluoranthene	59%	50%
	Benzo(a)pyrene	62%	50%
PAHs by Method 8270-SIM	Acenaphthylene	NC	50%
	Acenaphthene	146%	50%
	Fluorene	78%	50%
	Phenanthrene	134%	50%
	Fluoranthene	135%	50%
	Pyrene	127%	50%
	Benzo(a)anthracene	78%	50%
	Chrysene	64%	50%
	Benzo(b)fluoranthene	64%	50%
	Benzo(k)fluoranthene	64%	50%
	Benzo(a)pyrene	76%	50%
	Indeno(1,2,3-cd)pyrene	61%	50%
	Dibenz(a,h)anthracene	53%	50%
	Benzo(g,h,i)perylene	71%	50%
	Dibenzofuran	138%	50%
PCBs by Method 8082	AR1254	179%	50%
Bulk Organotins by Krone	Tributyl tin	77%	50%
Porewater Organotins by Krone	Tributyl tin	113%	50%
	Butyl tin ion	58%	50%

NC – Not calculable

The results for all analytes noted above are qualified as estimated and flagged 'J' or 'UJ' in BC-3-1 and BC-DUP-05212010 based on the elevated RPDs.

7. Reporting Limits – Acceptable except as noted below:

General – The reporting limits for one or more analytes in several samples were elevated due to the percent moisture content of the sample and/or the dilutions required to quantitate high concentrations of target analytes present in the samples. The elevated reporting limits may affect the use of the data for regulatory comparison.

Several samples required dilution to quantitate one or more analytes within the linear range of the instrument. The sample result which exceeded the calibration range of the instrument were flagged 'E' or 'ES' by the laboratory and has been qualified with the flag 'DNR' for Do Not Report. As the reporting limits were lower for the undiluted analysis, results for compounds that were not flagged 'E' or 'ES' by the laboratory in the undiluted analyses of these samples are qualified with the flag 'DNR' for the diluted analyses.

The results for one or more analytes in several samples were flagged 'J' by the laboratory to indicate that the sample concentration was below the reporting limit but above the method detection limit. The laboratory J-flagged results are considered estimated unless otherwise qualified based on quality control issues detailed in this report.

The reporting limits for one or more analytes in several samples were flagged with a 'Y' by the laboratory to indicate an elevated reporting limit due to matrix interference. The Y-flagged results are qualified as estimated and flagged 'UJ' based on the elevated reporting limits.

In order to meet the data quality objectives of the project, samples were analyzed by more than one method. In some cases, analytes were reported by more than one method for one sample. As a conservative measure, the lower reporting limit or higher detected result were reported and the alternate result qualified 'DNR.'

8. Other Items of Note

VOCs by Method 8260C – The laboratory noted that the internal standard area counts for d4-1,4-dichlorobenzene were below the method limits of -50% to 200% in BC-1-1, BC-3-1, BC-4-1, and BC-5-1. The laboratory reanalyzed these samples. The internal standard area counts for BC-3-1 and BC-5-1 were acceptable in the reanalyses of these samples; however, the internal standard area counts for d4-1,4-dichlorobenzene were low in the reanalyses of BC-1-1 and BC-4-1. The results for all VOCs in the initial analyses of BC-3-1 and BC-5-1 are flagged 'DNR' and will not be used. The results for all VOCs in the initial analyses of BC-1-1 and BC-4-1 are qualified as estimated and flagged 'UJ' based on the internal standard area counts. The results for all VOCs in the reanalyses of these samples are flagged 'DNR' and will not be used.

SVOCs by Method 8270D – The laboratory noted that percent differences for pentachlorophenol in the continuing calibrations analyzed on June 2, 2010 (low), June 3, 2010 (low), and June 22, 2010 (high) were outside the method limits of ±20%. The result for pentachlorophenol in BC-4-1 is qualified as estimated and flagged 'UJ' based on the associated continuing calibration result. Pentachlorophenol was not reported from the other samples analyzed on June 2, 2010 and June 3, 2010. Pentachlorophenol was not detected in the samples analyzed on June 22, 2010; therefore, data were not qualified based on the elevated continuing calibration result.

The laboratory noted that the internal standard area counts for chrysene-d12 and di-n-octylphthalate exceeded the method limits of -50% to 200% in BC-1-1, BC-3-1, BC-5-1, and BC-DUP-05212010. The laboratory reanalyzed these samples at dilutions with acceptable internal standard results. As noted in Section 7, one or more SVOC results were flagged 'DNR' based on reporting limits; therefore, the results for benzo(a)anthracene, benzo(b)fluoranthene, chrysene, pyrene, bis(2-ethylhexyl)phthalate, and/or di-n-octylphthalate reported as detected in the initial analyses of BC-1-1, BC-3-1, BC-5-1, and BC-DUP-05212010 are flagged 'J' based on the elevated internal standard area counts. Benzo(a)anthracene, benzo(b)fluoranthene, chrysene, pyrene, bis(2-ethylhexyl)phthalate, and/or di-n-octylphthalate reported as not detected in the initial analyses of these samples do not require qualification.

PAHs by Method 8270-SIM – The laboratory noted that the percent differences for pyrene in the continuing calibrations analyzed on June 3, 2010 and June 4, 2010 exceeded the method limits of ±20%. The results for pyrene in BC-1-1, BC-2-1, BC-3-1, BC-4-1, BC-6-1, and BC-DUP-05212010 are qualified as estimated and flagged 'J' based on the elevated continuing calibration results.

Metals

Samples were analyzed for total metals by EPA Methods 6010B and 7471A.

1. Holding Times – Acceptable

2. Blanks – Acceptable

3. Laboratory Control Samples (LCS) – Acceptable

4. Matrix Spikes (MS) – Acceptable where applicable except as noted below:

   A MS was performed on BC-5-1. The percent recoveries for chromium (182%), copper (295%), and zinc (42.2%) were outside the control limits of 75-125%. As the concentrations for copper and zinc were more than four times (4x) the spike concentration, data were not qualified for copper and zinc based on the MS results. The results for chromium in BC-1-1, BC-2-1, BC-3-1, BC-4-1, BC-5-1, BC-6-1, and BC-DUP-05212010 are qualified as estimated and flagged 'J' based on the elevated MS result.

   A MS was performed on BC-1-2. The percent recovery for copper (135%) exceeded the control limits of 75-125%. The results for copper in BC-1-2, BC-2-2, BC-3-2, BC-4-2, BC-5-2, and BC-6-2 are qualified as estimated and flagged 'J' based on the elevated MS result.

5. Laboratory Duplicates – Acceptable except as noted below:

   A laboratory duplicate was performed on BC-5-1. Results were acceptable.

   A laboratory duplicate was performed on BC-1-2. The RPD for lead (107%) exceeded the control limit of 30%. The results for lead in BC-1-2, BC-2-2, BC-3-2, BC-4-2, BC-5-2, and BC-6-2 are qualified as estimated and flagged 'J' based on the elevated laboratory duplicate RPD.

6. Field Duplicate – Acceptable except as noted below:

   A field duplicate was collected for BC-3-1 and identified as BC-DUP-05212010. The RPDs for arsenic (100%), cadmium (88%), chromium (66%), copper (78%), lead (51%), mercury (112%), and zinc (124%) were more than 50%. The RPD for silver was not calculable. The results for arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc are qualified as estimated and flagged 'J' or 'UJ' in BC-3-1 and BC-DUP-05212010 based on the elevated field duplicate RPDs.

7. Reporting Limits – Acceptable except as noted below:

   The reporting limits for one or more metals in several samples were elevated due to the percent moisture content of the samples. The elevated reporting limits may affect the use of the data for regulatory comparison.

Conventional Parameters

Samples were analyzed for ammonia, total sulfides, total solids, preserved total solids, TVS, and TOC by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Blanks – Acceptable

3. Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) – Acceptable where applicable

4. Matrix Spikes (MS) – Acceptable where applicable except as noted below:

   Ammonia by Method 350.1-modified – Matrix spikes were performed on SG-45 and BC-5-1. Results were acceptable.

   Total Sulfides by Method 376.2 – A MS was performed SG-45. Results were acceptable.

   A matrix spike triplicate was performed on BC-5-1. The percent recovery for total sulfide (58.2%) was below the control limits of 75-125%. Total sulfide was not recovered in the triplicate analysis of this matrix spike. The results for total sulfide in BC-1-1, BC-2-1, BC-3-1, BC-4-1, BC-5-1, BC-6-1, BC-DUP-05212010, BC-1-2, BC-2-2, BC-3-2, BC-4-2, BC-5-2, and BC-6-2 are qualified as estimated and flagged 'J' or 'UJ' based on the MS result.

   TOC by Plumb (1981) – Matrix spikes were performed on SG-45 and BC-5-1. Results were acceptable.

5. Laboratory Duplicates – Acceptable

   Ammonia by Method 350.1-modified – Laboratory duplicates were performed on SG-45 and BC-5-1. Results were acceptable.

   Total Sulfides by Method 376.2 – Laboratory duplicates were performed on SG-45 and BC-5-1. Results were acceptable.

   Total Solids and Preserved Total Solids by Method 160.3 – Laboratory duplicates were performed on SG-45 and BC-5-1. Results were acceptable.

   TVS by Method 160.4 – Laboratory duplicates were performed on SG-45 and BC-5-1. Results were acceptable.

   TOC by Plumb (1981) – Laboratory duplicates were performed on SG-45 and BC-5-1. Results were acceptable.

6. Field Duplicate – Acceptable except as noted below:

   General – A field duplicate was collected for BC-3-1 and identified as BC-DUP-05212010. Results were acceptable except as noted below.

   Ammonia by Method 350.1-modified – The RPD for ammonia (89%) for the parent sample field duplicate pair was more than 50%. The results for ammonia in BC-3-1 and BC-DUP-05212010 are qualified as estimated and flagged 'J' based on the elevated field duplicate RPD.

7. Reporting Limits – Acceptable except as noted below:

   Total Sulfides by Method 376.2 – The reporting limits for total sulfides in several samples were elevated due to the percent moisture content of the samples. The elevated reporting limits may affect the use of the data for regulatory comparison.

Overall Assessment of Data

The completeness for ARI SDGs QX39, QX48, QX76, QY34, QY09, QZ32, QZ34, RA03, and RA87 is 100%. The usefulness of this data is based on USEPA guidance documents listed in the introduction to this report. Upon consideration of the information presented above, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-1-1	QX76A	Sediment	Sulfide	40.4	mg/kg		J	EPA376.2
BC-1-1	QX76A	Sediment	Dibutyltin Ion	7500	ug/kg	E	DNR	KRONE89
BC-1-1	QX76A	Sediment	Tributyltin Ion	32000	ug/kg	E	DNR	KRONE89
BC-1-1	QX76A	Sediment	4,4'-DDE	96	ug/kg	Y	UJ	SW8081B
BC-1-1	QX76A	Sediment	Aldrin	26	ug/kg	Y	UJ	SW8081B
BC-1-1	QX76A	Sediment	Dieldrin	6.1	ug/kg	Y	UJ	SW8081B
BC-1-1	QX76A	Sediment	Hexachlorobenzene	9.2	ug/kg	Y	UJ	SW8081B
BC-1-1	QX76A	Sediment	Aroclor 1248	350	ug/kg	Y	UJ	SW8082
BC-1-1	QX76A	Sediment	1,2,4-Trichlorobenzene	5	ug/kg	U	UJ	SW8260C
BC-1-1	QX76A	Sediment	1,2-Dichlorobenzene	1	ug/kg	U	UJ	SW8260C
BC-1-1	QX76A	Sediment	1,4-Dichlorobenzene	1	ug/kg	U	UJ	SW8260C
BC-1-1	QX76A	Sediment	1,2,4-Trichlorobenzene	160	ug/kg	U	DNR	SW8270D
BC-1-1	QX76A	Sediment	1,2-Dichlorobenzene	160	ug/kg	U	DNR	SW8270D
BC-1-1	QX76A	Sediment	1,4-Dichlorobenzene	160	ug/kg	U	DNR	SW8270D
BC-1-1	QX76A	Sediment	2-Methylnaphthalene	160	ug/kg	J	DNR	SW8270D
BC-1-1	QX76A	Sediment	Benzo(a)anthracene	2600	ug/kg		J	SW8270D
BC-1-1	QX76A	Sediment	Benzo(g,h,i)perylene	440	ug/kg		DNR	SW8270D
BC-1-1	QX76A	Sediment	Benzoic Acid	440	ug/kg	J	J	SW8270D
BC-1-1	QX76A	Sediment	bis(2-Ethylhexyl)phthalate	13000	ug/kg	E	DNR	SW8270D
BC-1-1	QX76A	Sediment	Chrysene	4200	ug/kg		J	SW8270D
BC-1-1	QX76A	Sediment	Dibenz(a,h)anthracene	230	ug/kg		DNR	SW8270D
BC-1-1	QX76A	Sediment	Di-n-Octyl phthalate	440	ug/kg		J	SW8270D
BC-1-1	QX76A	Sediment	Hexachlorobenzene	160	ug/kg	U	DNR	SW8270D
BC-1-1	QX76A	Sediment	Hexachlorobutadiene	160	ug/kg	U	DNR	SW8270D
BC-1-1	QX76A	Sediment	Indeno(1,2,3-cd)pyrene	490	ug/kg		DNR	SW8270D
BC-1-1	QX76A	Sediment	Naphthalene	140	ug/kg	J	DNR	SW8270D
BC-1-1	QX76A	Sediment	Phenol	570	ug/kg		U	SW8270D
BC-1-1	QX76A	Sediment	Pyrene	5600	ug/kg		DNR	SW8270D
BC-1-1	QX76A	Sediment	Acenaphthene	200	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Acenaphthylene	110	ug/kg	Y	DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Anthracene	580	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Benzo(a)anthracene	2200	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Benzo(a)pyrene	1800	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Benzo(b)fluoranthene	2100	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Benzo(k)fluoranthene	2100	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Chrysene	3400	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Dibenzofuran	140	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Fluoranthene	5000	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Fluorene	260	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Phenanthrene	1800	ug/kg		DNR	SW8270DSIM
BC-1-1	QX76A	Sediment	Pyrene	7000	ug/kg		J	SW8270DSIM
BC-1-1	QX76ARE	Sediment	Butyltin	1100	ug/kg		DNR	KRONE89
BC-1-1	QX76ARE	Sediment	Dibutyltin Ion	9400	ug/kg		J	KRONE89
BC-1-1	QX76ARE	Sediment	1,2,4-Trichlorobenzene	5.2	ug/kg	U	DNR	SW8260C
BC-1-1	QX76ARE	Sediment	1,2-Dichlorobenzene	1	ug/kg	U	DNR	SW8260C
BC-1-1	QX76ARE	Sediment	1,4-Dichlorobenzene	1	ug/kg	U	DNR	SW8260C
BC-1-1	QX76ARE	Sediment	1,2,4-Trichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	1,2-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	1,3-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	1,4-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	1-Methylnaphthalene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	2,4-Dimethylphenol	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	2-Methylnaphthalene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	2-Methylphenol	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	4-Methylphenol	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Acenaphthene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Acenaphthylene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Anthracene	1200	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzo(a)anthracene	2800	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzo(a)pyrene	2400	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzo(b)fluoranthene	2700	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzo(g,h,i)perylene	1600	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzo(k)fluoranthene	2700	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzoic Acid	10000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Benzyl Alcohol	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Butylbenzylphthalate	880	ug/kg	J	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Chrysene	4400	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Dibenz(a,h)anthracene	680	ug/kg	J	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Dibenzofuran	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Diethylphthalate	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Dimethylphthalate	8400	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Di-n-Butylphthalate	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Di-n-Octyl phthalate	660	ug/kg	J	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Fluoranthene	6900	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Fluorene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Hexachlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Hexachlorobutadiene	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Hexachloroethane	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Indeno(1,2,3-cd)pyrene	1400	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Naphthalene	1000	ug/kg	U	DNR	SW8270D

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-1-1	QX76ARE	Sediment	N-Nitrosodiphenylamine	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Pentachlorophenol	5200	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Phenanthrene	2600	ug/kg		DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Phenol	1000	ug/kg	U	DNR	SW8270D
BC-1-1	QX76ARE	Sediment	Pyrene	8200	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Sulfide	1.04	mg/kg	U	UJ	EPA376.2
BC-2-1	QX76B	Sediment	Butyltin	4400	ug/kg	E	DNR	KRONE89
BC-2-1	QX76B	Sediment	Dibutyltin Ion	4600	ug/kg	E	DNR	KRONE89
BC-2-1	QX76B	Sediment	Tributyltin Ion	42000	ug/kg	E	DNR	KRONE89
BC-2-1	QX76B	Sediment	4,4'-DDD	150	ug/kg	E	DNR	SW8081B
BC-2-1	QX76B	Sediment	4,4'-DDE	39	ug/kg	Y	UJ	SW8081B
BC-2-1	QX76B	Sediment	Aldrin	12	ug/kg	Y	UJ	SW8081B
BC-2-1	QX76B	Sediment	Dieldrin	25	ug/kg	Y	UJ	SW8081B
BC-2-1	QX76B	Sediment	gamma Chlordane	27	ug/kg	Y	UJ	SW8081B
BC-2-1	QX76B	Sediment	Heptachlor	2.9	ug/kg	Y	UJ	SW8081B
BC-2-1	QX76B	Sediment	Aroclor 1248	370	ug/kg	Y	UJ	SW8082
BC-2-1	QX76B	Sediment	1,2,4-Trichlorobenzene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	1,2-Dichlorobenzene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	1,4-Dichlorobenzene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	2-Methylnaphthalene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	4-Methylphenol	57	ug/kg	J	J	SW8270D
BC-2-1	QX76B	Sediment	Acenaphthene	100	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Anthracene	600	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Benzo(g,h,i)perylene	250	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Dibenz(a,h)anthracene	150	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Dibenzofuran	54	ug/kg	J	DNR	SW8270D
BC-2-1	QX76B	Sediment	Fluoranthene	5200	ug/kg	E	DNR	SW8270D
BC-2-1	QX76B	Sediment	Hexachlorobenzene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	Hexachlorobutadiene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	Indeno(1,2,3-cd)pyrene	290	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Naphthalene	59	ug/kg	U	DNR	SW8270D
BC-2-1	QX76B	Sediment	Pyrene	2000	ug/kg		DNR	SW8270D
BC-2-1	QX76B	Sediment	Acenaphthylene	68	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Anthracene	420	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Benzo(a)anthracene	1600	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Benzo(a)pyrene	1300	ug/kg	E	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Benzo(b)fluoranthene	1100	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Benzo(g,h,i)perylene	740	ug/kg	E	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Benzo(k)fluoranthene	1100	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Chrysene	1800	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Fluoranthene	4100	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Fluorene	100	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Indeno(1,2,3-cd)pyrene	720	ug/kg	E	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Phenanthrene	1200	ug/kg	E	DNR	SW8270DSIM
BC-2-1	QX76B	Sediment	Pyrene	1600	ug/kg	ES	DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Dibutyltin Ion	2900	ug/kg		J	KRONE89
BC-2-1	QX76BRE	Sediment	4,4'-DDE	29	ug/kg		DNR	SW8081B
BC-2-1	QX76BRE	Sediment	4,4'-DDT	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	Aldrin	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	alpha Chlordane	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	cis-Nonachlor	20	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	Dieldrin	20	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	gamma Chlordane	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	gamma-BHC (Lindane)	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	Heptachlor	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	Hexachlorobenzene	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	Hexachlorobutadiene	9.8	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	oxy Chlordane	20	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	trans-Nonachlor	20	ug/kg	U	DNR	SW8081B
BC-2-1	QX76BRE	Sediment	1,2,4-Trichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	1,2-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	1,3-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	1,4-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	1-Methylnaphthalene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	2,4-Dimethylphenol	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	2-Methylnaphthalene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	2-Methylphenol	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	4-Methylphenol	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Acenaphthene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Acenaphthylene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzo(a)anthracene	2100	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzo(a)pyrene	1400	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzo(b)fluoranthene	2000	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzo(g,h,i)perylene	770	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzo(k)fluoranthene	2000	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzoic Acid	3900	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Benzyl Alcohol	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	bis(2-Ethylhexyl)phthalate	3200	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Butylbenzylphthalate	580	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Chrysene	3200	ug/kg		DNR	SW8270D

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-2-1	QX76BRE	Sediment	Dibenz(a,h)anthracene	360	ug/kg	J	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Dibenzofuran	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Diethylphthalate	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Dimethylphthalate	470	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Di-n-Butylphthalate	450	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Di-n-Octyl phthalate	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Fluorene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Hexachlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Hexachlorobutadiene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Hexachloroethane	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Indeno(1,2,3-cd)pyrene	710	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Naphthalene	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	N-Nitrosodiphenylamine	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Pentachlorophenol	2000	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Phenanthrene	1200	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Phenol	390	ug/kg	U	DNR	SW8270D
BC-2-1	QX76BRE	Sediment	Pyrene	3300	ug/kg		DNR	SW8270D
BC-2-1	QX76BRE	Sediment	2-Methylnaphthalene	96	ug/kg	U	DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Acenaphthene	150	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Acenaphthylene	96	ug/kg	U	DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Anthracene	310	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Dibenz(a,h)anthracene	270	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Dibenzofuran	96	ug/kg	U	DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Fluorene	110	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Indeno(1,2,3-cd)pyrene	650	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Naphthalene	110	ug/kg		DNR	SW8270DSIM
BC-2-1	QX76BRE	Sediment	Pyrene	4200	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Ammonia (NH3) as Nitrogen (N)	1.25	mg/kg		J	EPA350.1M
BC-3-1	QX76C	Sediment	Sulfide	1.33	mg/kg	U	UJ	EPA376.2
BC-3-1	QX76C	Sediment	Butyltin	4100	ug/kg	E	DNR	KRONE89
BC-3-1	QX76C	Sediment	Dibutyltin Ion	21000	ug/kg	E	DNR	KRONE89
BC-3-1	QX76C	Sediment	Tributyltin Ion	71000	ug/kg	E	DNR	KRONE89
BC-3-1	QX76C	Sediment	Arsenic	90	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Cadmium	1.8	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Chromium	190	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Copper	6190	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Lead	225	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Silver	10.5	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Zinc	2780	mg/kg		J	SW6010B
BC-3-1	QX76C	Sediment	Mercury	6.7	mg/kg		J	SW7471A
BC-3-1	QX76C	Sediment	4,4'-DDD	190	ug/kg		J	SW8081B
BC-3-1	QX76C	Sediment	4,4'-DDE	930	ug/kg	Y	UJ	SW8081B
BC-3-1	QX76C	Sediment	4,4'-DDT	370	ug/kg		J	SW8081B
BC-3-1	QX76C	Sediment	Dieldrin	150	ug/kg	Y	UJ	SW8081B
BC-3-1	QX76C	Sediment	gamma Chlordane	750	ug/kg	Y	UJ	SW8081B
BC-3-1	QX76C	Sediment	gamma-BHC (Lindane)	21	ug/kg	P	J	SW8081B
BC-3-1	QX76C	Sediment	Heptachlor	18	ug/kg		J	SW8081B
BC-3-1	QX76C	Sediment	trans-Nonachlor	96	ug/kg	Y	UJ	SW8081B
BC-3-1	QX76C	Sediment	Aroclor 1248	5300	ug/kg	Y	UJ	SW8082
BC-3-1	QX76C	Sediment	Aroclor 1254	18000	ug/kg		J	SW8082
BC-3-1	QX76C	Sediment	Aroclor 1260	2100	ug/kg	Y	UJ	SW8082
BC-3-1	QX76C	Sediment	1,2,4-Trichlorobenzene	5	ug/kg	U	DNR	SW8260C
BC-3-1	QX76C	Sediment	1,2-Dichlorobenzene	1	ug/kg	U	DNR	SW8260C
BC-3-1	QX76C	Sediment	1,4-Dichlorobenzene	1	ug/kg	U	DNR	SW8260C
BC-3-1	QX76C	Sediment	1,2,4-Trichlorobenzene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	1,2-Dichlorobenzene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	1,4-Dichlorobenzene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	2-Methylnaphthalene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	Acenaphthene	280	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Benzo(a)anthracene	2300	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Benzo(a)pyrene	1900	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Benzo(b)fluoranthene	2400	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Benzo(g,h,i)perylene	350	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Benzo(k)fluoranthene	2400	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	bis(2-Ethylhexyl)phthalate	8500	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Butylbenzylphthalate	1400	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Chrysene	3300	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Dibenz(a,h)anthracene	190	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Dibenzofuran	86	ug/kg	J	DNR	SW8270D
BC-3-1	QX76C	Sediment	Dimethylphthalate	370	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Di-n-Octyl phthalate	250	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Fluoranthene	8100	ug/kg		J	SW8270D
BC-3-1	QX76C	Sediment	Fluorene	160	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Hexachlorobenzene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	Hexachlorobutadiene	120	ug/kg	U	DNR	SW8270D
BC-3-1	QX76C	Sediment	Indeno(1,2,3-cd)pyrene	380	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Naphthalene	86	ug/kg	J	J	SW8270D
BC-3-1	QX76C	Sediment	Phenanthrene	1300	ug/kg		DNR	SW8270D
BC-3-1	QX76C	Sediment	Phenol	520	ug/kg		U	SW8270D
BC-3-1	QX76C	Sediment	Pyrene	4100	ug/kg		DNR	SW8270D

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-3-1	QX76C	Sediment	Acenaphthene	230	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Acenaphthylene	93	ug/kg	U	DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Anthracene	320	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Benzo(a)anthracene	2000	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Benzo(a)pyrene	1500	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Benzo(b)fluoranthene	1700	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Benzo(g,h,i)perylene	800	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Benzo(k)fluoranthene	1700	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Chrysene	2900	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Dibenz(a,h)anthracene	380	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Dibenzofuran	110	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Fluoranthene	7200	ug/kg		DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Fluorene	180	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Indeno(1,2,3-cd)pyrene	730	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Naphthalene	93	ug/kg	U	DNR	SW8270DSIM
BC-3-1	QX76C	Sediment	Phenanthrene	2500	ug/kg		J	SW8270DSIM
BC-3-1	QX76C	Sediment	Pyrene	7600	ug/kg		J	SW8270DSIM
BC-3-1	QX76CRE	Sediment	Dibutyltin Ion	9700	ug/kg		J	KRONE89
BC-3-1	QX76CRE	Sediment	Tributyltin Ion	45000	ug/kg		J	KRONE89
BC-3-1	QX76CRE	Sediment	4,4'-DDD	200	ug/kg		DNR	SW8081B
BC-3-1	QX76CRE	Sediment	4,4'-DDE	1100	ug/kg	Y	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	4,4'-DDT	430	ug/kg		DNR	SW8081B
BC-3-1	QX76CRE	Sediment	Aldrin	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	alpha Chlordane	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	cis-Nonachlor	190	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	Dieldrin	190	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	gamma Chlordane	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	gamma-BHC (Lindane)	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	Heptachlor	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	Hexachlorobenzene	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	Hexachlorobutadiene	96	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	oxy Chlordane	190	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	trans-Nonachlor	190	ug/kg	U	DNR	SW8081B
BC-3-1	QX76CRE	Sediment	1,2,4-Trichlorobenzene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	1,2-Dichlorobenzene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	1,3-Dichlorobenzene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	1,4-Dichlorobenzene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	1-Methylnaphthalene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	2,4-Dimethylphenol	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	2-Methylnaphthalene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	2-Methylphenol	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	4-Methylphenol	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Acenaphthene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Acenaphthylene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Anthracene	720	ug/kg	J	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzo(a)anthracene	2800	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzo(a)pyrene	1900	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzo(b)fluoranthene	2100	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzo(g,h,i)perylene	1300	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzo(k)fluoranthene	2100	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzoic Acid	7900	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Benzyl Alcohol	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	bis(2-Ethylhexyl)phthalate	11000	ug/kg		J	SW8270D
BC-3-1	QX76CRE	Sediment	Butylbenzylphthalate	1900	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Chrysene	3900	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Dibenz(a,h)anthracene	520	ug/kg	J	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Dibenzofuran	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Diethylphthalate	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Dimethylphthalate	490	ug/kg	J	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Di-n-Butylphthalate	560	ug/kg	J	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Di-n-Octyl phthalate	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Fluoranthene	7200	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Fluorene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Hexachlorobenzene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Hexachlorobutadiene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Hexachloroethane	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Indeno(1,2,3-cd)pyrene	1000	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Naphthalene	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	N-Nitrosodiphenylamine	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Pentachlorophenol	3900	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Phenanthrene	1600	ug/kg		DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Phenol	790	ug/kg	U	DNR	SW8270D
BC-3-1	QX76CRE	Sediment	Pyrene	7300	ug/kg		DNR	SW8270D
BC-4-1	QX76D	Sediment	Sulfide	18.9	mg/kg		J	EPA376.2
BC-4-1	QX76D	Sediment	Dibutyltin Ion	2400	ug/kg	E	DNR	KRONE89
BC-4-1	QX76D	Sediment	Tributyltin Ion	12000	ug/kg	E	DNR	KRONE89
BC-4-1	QX76D	Sediment	alpha Chlordane	22	ug/kg	Y	UJ	SW8081B
BC-4-1	QX76D	Sediment	trans-Nonachlor	13	ug/kg	Y	UJ	SW8081B
BC-4-1	QX76D	Sediment	Aroclor 1248	150	ug/kg	Y	UJ	SW8082
BC-4-1	QX76D	Sediment	1,2,4-Trichlorobenzene	5	ug/kg	U	UJ	SW8260C

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-4-1	QX76D	Sediment	1,2-Dichlorobenzene	1	ug/kg	U	UJ	SW8260C
BC-4-1	QX76D	Sediment	1,4-Dichlorobenzene	1	ug/kg	U	UJ	SW8260C
BC-4-1	QX76D	Sediment	1,2,4-Trichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	1,2-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	1,3-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	1,4-Dichlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	1-Methylnaphthalene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	2,4-Dimethylphenol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	2-Methylnaphthalene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	2-Methylphenol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Acenaphthene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Acenaphthylene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Anthracene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Benzo(g,h,i)perylene	490	ug/kg	J	DNR	SW8270D
BC-4-1	QX76D	Sediment	Benzoic Acid	10000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Benzyl Alcohol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Butylbenzylphthalate	340	ug/kg	J	J	SW8270D
BC-4-1	QX76D	Sediment	Dibenz(a,h)anthracene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Dibenzofuran	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Diethylphthalate	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Di-n-Butylphthalate	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Di-n-Octyl phthalate	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Fluorene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Hexachlorobenzene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Hexachlorobutadiene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Hexachloroethane	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Indeno(1,2,3-cd)pyrene	460	ug/kg	J	J	SW8270D
BC-4-1	QX76D	Sediment	Naphthalene	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	N-Nitrosodiphenylamine	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76D	Sediment	Pentachlorophenol	2600	ug/kg	U	UJ	SW8270D
BC-4-1	QX76D	Sediment	Phenol	590	ug/kg		U	SW8270D
BC-4-1	QX76D	Sediment	Benzo(a)anthracene	750	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Benzo(a)pyrene	810	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Benzo(b)fluoranthene	830	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Benzo(k)fluoranthene	830	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Chrysene	1100	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Fluoranthene	1400	ug/kg	E	DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Indeno(1,2,3-cd)pyrene	440	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Naphthalene	45	ug/kg		U	SW8270DSIM
BC-4-1	QX76D	Sediment	Phenanthrene	210	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76D	Sediment	Pyrene	820	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Butyltin	470	ug/kg		DNR	KRONE89
BC-4-1	QX76DRE	Sediment	Dibutyltin Ion	2400	ug/kg		J	KRONE89
BC-4-1	QX76DRE	Sediment	1,2,4-Trichlorobenzene	4.6	ug/kg	U	DNR	SW8260C
BC-4-1	QX76DRE	Sediment	1,2-Dichlorobenzene	0.9	ug/kg	U	DNR	SW8260C
BC-4-1	QX76DRE	Sediment	1,4-Dichlorobenzene	0.9	ug/kg	U	DNR	SW8260C
BC-4-1	QX76DRE	Sediment	1,2,4-Trichlorobenzene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	1,2-Dichlorobenzene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	1,4-Dichlorobenzene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	2-Methylnaphthalene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	4-Methylphenol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Acenaphthene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Acenaphthylene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Anthracene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Benzo(a)anthracene	1400	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Benzo(a)pyrene	1200	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Benzo(b)fluoranthene	1300	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Benzo(g,h,i)perylene	820	ug/kg	J	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Benzo(k)fluoranthene	1300	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	bis(2-Ethylhexyl)phthalate	6900	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Butylbenzylphthalate	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Chrysene	2100	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Dibenz(a,h)anthracene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Dibenzofuran	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Dimethylphthalate	4000	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Fluoranthene	3600	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Fluorene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Hexachlorobenzene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Hexachlorobutadiene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Indeno(1,2,3-cd)pyrene	650	ug/kg	J	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Naphthalene	520	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Pentachlorophenol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Phenanthrene	2200	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Phenol	1000	ug/kg	U	DNR	SW8270D
BC-4-1	QX76DRE	Sediment	Pyrene	3600	ug/kg		DNR	SW8270D
BC-4-1	QX76DRE	Sediment	2-Methylnaphthalene	60	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Acenaphthene	46	ug/kg	U	DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Acenaphthylene	46	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Anthracene	110	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Benzo(a)anthracene	770	ug/kg		DNR	SW8270DSIM

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-4-1	QX76DRE	Sediment	Benzo(a)pyrene	820	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Benzo(b)fluoranthene	900	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Benzo(g,h,i)perylene	450	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Benzo(k)fluoranthene	900	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Chrysene	1000	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Dibenz(a,h)anthracene	230	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Dibenzofuran	46	ug/kg	U	DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Fluorene	46	ug/kg	U	DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Indeno(1,2,3-cd)pyrene	380	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Naphthalene	69	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Phenanthrene	200	ug/kg		DNR	SW8270DSIM
BC-4-1	QX76DRE	Sediment	Pyrene	1600	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Sulfide	752	mg/kg		J	EPA376.2
BC-5-1	QX76E	Sediment	Dibutyltin Ion	5500	ug/kg	E	DNR	KRONE89
BC-5-1	QX76E	Sediment	Tributyltin Ion	20000	ug/kg	E	DNR	KRONE89
BC-5-1	QX76E	Sediment	4,4'-DDE	60	ug/kg	Y	UJ	SW8081B
BC-5-1	QX76E	Sediment	Dieldrin	30	ug/kg	Y	UJ	SW8081B
BC-5-1	QX76E	Sediment	gamma Chlordane	39	ug/kg	Y	UJ	SW8081B
BC-5-1	QX76E	Sediment	gamma-BHC (Lindane)	2.8	ug/kg	Y	UJ	SW8081B
BC-5-1	QX76E	Sediment	oxy Chlordane	11	ug/kg	Y	UJ	SW8081B
BC-5-1	QX76E	Sediment	Aroclor 1248	370	ug/kg	Y	UJ	SW8082
BC-5-1	QX76E	Sediment	1,2,4-Trichlorobenzene	5.9	ug/kg	U	DNR	SW8260C
BC-5-1	QX76E	Sediment	1,2-Dichlorobenzene	1.2	ug/kg	U	DNR	SW8260C
BC-5-1	QX76E	Sediment	1,4-Dichlorobenzene	1.2	ug/kg	U	DNR	SW8260C
BC-5-1	QX76E	Sediment	1,2,4-Trichlorobenzene	65	ug/kg	U	DNR	SW8270D
BC-5-1	QX76E	Sediment	1,2-Dichlorobenzene	65	ug/kg	U	DNR	SW8270D
BC-5-1	QX76E	Sediment	1,4-Dichlorobenzene	65	ug/kg	U	DNR	SW8270D
BC-5-1	QX76E	Sediment	1-Methylnaphthalene	51	ug/kg	J	J	SW8270D
BC-5-1	QX76E	Sediment	2-Methylnaphthalene	84	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Acenaphthene	120	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Acenaphthylene	290	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Anthracene	880	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Benzo(a)anthracene	2700	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Benzo(a)pyrene	2600	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Benzo(g,h,i)perylene	800	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Benzoic Acid	390	ug/kg	J	J	SW8270D
BC-5-1	QX76E	Sediment	Benzyl Alcohol	1400	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	bis(2-Ethylhexyl)phthalate	23000	ug/kg	ES	DNR	SW8270D
BC-5-1	QX76E	Sediment	Butylbenzylphthalate	870	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Chrysene	4500	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Dibenz(a,h)anthracene	430	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Dibenzofuran	97	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Dimethylphthalate	6400	ug/kg	E	DNR	SW8270D
BC-5-1	QX76E	Sediment	Di-n-Butylphthalate	510	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Di-n-Octyl phthalate	890	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Fluoranthene	3900	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Fluorene	250	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Hexachlorobenzene	65	ug/kg	U	DNR	SW8270D
BC-5-1	QX76E	Sediment	Hexachlorobutadiene	65	ug/kg	U	DNR	SW8270D
BC-5-1	QX76E	Sediment	Indeno(1,2,3-cd)pyrene	790	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Naphthalene	120	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Pentachlorophenol	260	ug/kg	J	J	SW8270D
BC-5-1	QX76E	Sediment	Phenanthrene	990	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Phenol	900	ug/kg		J	SW8270D
BC-5-1	QX76E	Sediment	Pyrene	3800	ug/kg		DNR	SW8270D
BC-5-1	QX76E	Sediment	Acenaphthylene	210	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Anthracene	840	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Benzo(a)anthracene	2500	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Benzo(a)pyrene	2600	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Benzo(b)fluoranthene	2800	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Benzo(k)fluoranthene	2800	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Chrysene	4100	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Fluoranthene	5000	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Fluorene	200	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Phenanthrene	980	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76E	Sediment	Pyrene	4300	ug/kg	E	DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Butyltin	780	ug/kg		DNR	KRONE89
BC-5-1	QX76ERE	Sediment	Dibutyltin Ion	7900	ug/kg		J	KRONE89
BC-5-1	QX76ERE	Sediment	1,2,4-Trichlorobenzene	5.5	ug/kg	U	UJ	SW8260C
BC-5-1	QX76ERE	Sediment	1,2-Dichlorobenzene	1.1	ug/kg	U	UJ	SW8260C
BC-5-1	QX76ERE	Sediment	1,4-Dichlorobenzene	1.1	ug/kg	U	UJ	SW8260C
BC-5-1	QX76ERE	Sediment	1,2,4-Trichlorobenzene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	1,2-Dichlorobenzene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	1,3-Dichlorobenzene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	1,4-Dichlorobenzene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	1-Methylnaphthalene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	2,4-Dimethylphenol	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	2-Methylnaphthalene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	2-Methylphenol	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	4-Methylphenol	2000	ug/kg	U	DNR	SW8270D

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-5-1	QX76ERE	Sediment	Acenaphthene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Acenaphthylene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Anthracene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzo(a)anthracene	3400	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzo(a)pyrene	2800	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzo(b)fluoranthene	3700	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzo(g,h,i)perylene	1600	ug/kg	J	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzo(k)fluoranthene	3700	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzoic Acid	20000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Benzyl Alcohol	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Butylbenzylphthalate	1100	ug/kg	J	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Chrysene	5500	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Dibenz(a,h)anthracene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Dibenzofuran	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Diethylphthalate	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Di-n-Butylphthalate	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Di-n-Octyl phthalate	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Fluoranthene	3700	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Fluorene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Hexachlorobenzene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Hexachlorobutadiene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Hexachloroethane	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Indeno(1,2,3-cd)pyrene	1400	ug/kg	J	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Naphthalene	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	N-Nitrosodiphenylamine	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Pentachlorophenol	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Phenanthrene	1200	ug/kg	J	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Phenol	2000	ug/kg	U	DNR	SW8270D
BC-5-1	QX76ERE	Sediment	Pyrene	6400	ug/kg		DNR	SW8270D
BC-5-1	QX76ERE	Sediment	2-Methylnaphthalene	180	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Acenaphthene	140	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Acenaphthylene	130	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Anthracene	480	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Benzo(g,h,i)perylene	1300	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Dibenz(a,h)anthracene	560	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Dibenzofuran	120	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Fluorene	160	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Indeno(1,2,3-cd)pyrene	1200	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Naphthalene	260	ug/kg		DNR	SW8270DSIM
BC-5-1	QX76ERE	Sediment	Phenanthrene	940	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Sulfide	292	mg/kg		J	EPA376.2
BC-6-1	QX76F	Sediment	Dibutyltin Ion	25	ug/kg		J	KRONE89
BC-6-1	QX76F	Sediment	1,2,4-Trichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-6-1	QX76F	Sediment	1,2-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-6-1	QX76F	Sediment	1,4-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-6-1	QX76F	Sediment	1-Methylnaphthalene	12	ug/kg	J	J	SW8270D
BC-6-1	QX76F	Sediment	2-Methylnaphthalene	14	ug/kg	J	J	SW8270D
BC-6-1	QX76F	Sediment	Acenaphthene	190	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Acenaphthylene	49	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Anthracene	120	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Benzo(a)anthracene	500	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Benzo(a)pyrene	330	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Benzo(b)fluoranthene	460	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Benzo(g,h,i)perylene	59	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Benzo(k)fluoranthene	460	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Chrysene	750	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Dibenz(a,h)anthracene	38	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Dibenzofuran	38	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Di-n-Butylphthalate	13	ug/kg	J	J	SW8270D
BC-6-1	QX76F	Sediment	Di-n-Octyl phthalate	13	ug/kg	J	J	SW8270D
BC-6-1	QX76F	Sediment	Fluoranthene	840	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Fluorene	54	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Hexachlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-6-1	QX76F	Sediment	Hexachlorobutadiene	20	ug/kg	U	DNR	SW8270D
BC-6-1	QX76F	Sediment	Indeno(1,2,3-cd)pyrene	64	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Naphthalene	26	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Phenanthrene	190	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	Phenol	350	ug/kg		U	SW8270D
BC-6-1	QX76F	Sediment	Pyrene	610	ug/kg		DNR	SW8270D
BC-6-1	QX76F	Sediment	2-Methylnaphthalene	12	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Benzo(a)anthracene	940	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Benzo(a)pyrene	550	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Benzo(b)fluoranthene	490	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Benzo(k)fluoranthene	490	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Chrysene	1100	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Fluoranthene	1500	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Naphthalene	26	ug/kg		U	SW8270DSIM
BC-6-1	QX76F	Sediment	Phenanthrene	470	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76F	Sediment	Pyrene	1900	ug/kg	E	DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	2-Methylnaphthalene	46	ug/kg	U	DNR	SW8270DSIM

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-6-1	QX76FRE	Sediment	Acenaphthene	240	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Acenaphthylene	91	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Anthracene	160	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Benzo(g,h,i)perylene	210	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Dibenz(a,h)anthracene	120	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Dibenzofuran	96	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Fluorene	140	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Indeno(1,2,3-cd)pyrene	200	ug/kg		DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Naphthalene	46	ug/kg	U	DNR	SW8270DSIM
BC-6-1	QX76FRE	Sediment	Pyrene	2500	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Ammonia (NH3) as Nitrogen (N)	0.48	mg/kg		J	EPA350.1M
BC-Dup-05212010	QX76G	Sediment	Sulfide	1.9	mg/kg		J	EPA376.2
BC-Dup-05212010	QX76G	Sediment	Butyltin	1700	ug/kg	E	DNR	KRONE89
BC-Dup-05212010	QX76G	Sediment	Dibutyltin Ion	4000	ug/kg	E	DNR	KRONE89
BC-Dup-05212010	QX76G	Sediment	Tributyltin Ion	17000	ug/kg	E	DNR	KRONE89
BC-Dup-05212010	QX76G	Sediment	Arsenic	30	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Cadmium	0.7	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Chromium	96	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Copper	2730	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Lead	133	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Silver	0.8	mg/kg	U	UJ	SW6010B
BC-Dup-05212010	QX76G	Sediment	Zinc	649	mg/kg		J	SW6010B
BC-Dup-05212010	QX76G	Sediment	Mercury	1.88	mg/kg		J	SW7471A
BC-Dup-05212010	QX76G	Sediment	4,4'-DDD	730	ug/kg	E	DNR	SW8081B
BC-Dup-05212010	QX76G	Sediment	4,4'-DDE	22	ug/kg		J	SW8081B
BC-Dup-05212010	QX76G	Sediment	4,4'-DDT	700	ug/kg	E	DNR	SW8081B
BC-Dup-05212010	QX76G	Sediment	alpha Chlordane	34	ug/kg	Y	UJ	SW8081B
BC-Dup-05212010	QX76G	Sediment	Dieldrin	140	ug/kg	Y	UJ	SW8081B
BC-Dup-05212010	QX76G	Sediment	gamma Chlordane	41	ug/kg	Y	UJ	SW8081B
BC-Dup-05212010	QX76G	Sediment	gamma-BHC (Lindane)	0.98	ug/kg	U	UJ	SW8081B
BC-Dup-05212010	QX76G	Sediment	Heptachlor	0.98	ug/kg	U	UJ	SW8081B
BC-Dup-05212010	QX76G	Sediment	Aroclor 1248	1000	ug/kg	Y	UJ	SW8082
BC-Dup-05212010	QX76G	Sediment	Aroclor 1254	7600	ug/kg		J	SW8082
BC-Dup-05212010	QX76G	Sediment	Aroclor 1260	1000	ug/kg	Y	UJ	SW8082
BC-Dup-05212010	QX76G	Sediment	1,2,4-Trichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	1,2-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	1,4-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	1-Methylnaphthalene	10	ug/kg	J	J	SW8270D
BC-Dup-05212010	QX76G	Sediment	2-Methylnaphthalene	20	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Acenaphthene	63	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Benzo(a)anthracene	1200	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Benzo(a)pyrene	1000	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Benzo(b)fluoranthene	1300	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Benzo(g,h,i)perylene	230	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Benzo(k)fluoranthene	1300	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	bis(2-Ethylhexyl)phthalate	1600	ug/kg	ES	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Butylbenzylphthalate	270	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Chrysene	1600	ug/kg	E	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Dibenz(a,h)anthracene	140	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Dimethylphthalate	220	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Di-n-Octyl phthalate	120	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Fluoranthene	2700	ug/kg	ES	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Hexachlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Hexachlorobutadiene	20	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Indeno(1,2,3-cd)pyrene	260	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Naphthalene	30	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	Pentachlorophenol	58	ug/kg	J	J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Phenanthrene	600	ug/kg		J	SW8270D
BC-Dup-05212010	QX76G	Sediment	Phenol	580	ug/kg		U	SW8270D
BC-Dup-05212010	QX76G	Sediment	Pyrene	1300	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76G	Sediment	2-Methylnaphthalene	21	ug/kg		U	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Acenaphthene	36	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Acenaphthylene	59	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Anthracene	280	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Benzo(a)anthracene	900	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Benzo(a)pyrene	770	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Benzo(b)fluoranthene	990	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Benzo(g,h,i)perylene	380	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Benzo(k)fluoranthene	990	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Chrysene	1600	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Dibenz(a,h)anthracene	220	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Dibenzofuran	20	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Fluoranthene	2000	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Fluorene	79	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Indeno(1,2,3-cd)pyrene	390	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Naphthalene	33	ug/kg		U	SW8270DSIM
BC-Dup-05212010	QX76G	Sediment	Phenanthrene	520	ug/kg	E	DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Dibutyltin Ion	5800	ug/kg		J	KRONE89
BC-Dup-05212010	QX76GRE	Sediment	Tributyltin Ion	20000	ug/kg		J	KRONE89
BC-Dup-05212010	QX76GRE	Sediment	4,4'-DDD	810	ug/kg		J	SW8081B

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-Dup-05212010	QX76GRE	Sediment	4,4'-DDE	98	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	4,4'-DDT	670	ug/kg		J	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	Aldrin	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	alpha Chlordane	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	cis-Nonachlor	98	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	Dieldrin	98	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	gamma Chlordane	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	gamma-BHC (Lindane)	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	Heptachlor	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	Hexachlorobenzene	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	Hexachlorobutadiene	49	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	oxy Chlordane	98	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	trans-Nonachlor	98	ug/kg	U	DNR	SW8081B
BC-Dup-05212010	QX76GRE	Sediment	1,2,4-Trichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	1,2-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	1,3-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	1,4-Dichlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	1-Methylnaphthalene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	2,4-Dimethylphenol	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	2-Methylnaphthalene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	2-Methylphenol	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	4-Methylphenol	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Acenaphthene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Acenaphthylene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Anthracene	750	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzo(a)anthracene	1600	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzo(a)pyrene	1100	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzo(b)fluoranthene	1400	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzo(g,h,i)perylene	600	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzo(k)fluoranthene	1400	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzoic Acid	3900	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Benzyl Alcohol	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	bis(2-Ethylhexyl)phthalate	1900	ug/kg		J	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Butylbenzylphthalate	330	ug/kg	J	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Dibenz(a,h)anthracene	280	ug/kg	J	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Dibenzofuran	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Diethylphthalate	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Dimethylphthalate	280	ug/kg	J	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Di-n-Butylphthalate	280	ug/kg	J	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Di-n-Octyl phthalate	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Fluoranthene	2800	ug/kg		J	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Fluorene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Hexachlorobenzene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Hexachlorobutadiene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Hexachloroethane	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Indeno(1,2,3-cd)pyrene	560	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Naphthalene	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	N-Nitrosodiphenylamine	390	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Pentachlorophenol	2000	ug/kg	U	DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Phenanthrene	640	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Phenol	640	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	Pyrene	2400	ug/kg		DNR	SW8270D
BC-Dup-05212010	QX76GRE	Sediment	2-Methylnaphthalene	46	ug/kg	U	DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Acenaphthene	46	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Acenaphthylene	46	ug/kg	U	DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Anthracene	170	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Benzo(a)anthracene	880	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Benzo(a)pyrene	670	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Benzo(b)fluoranthene	880	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Benzo(g,h,i)perylene	310	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Benzo(k)fluoranthene	880	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Chrysene	1500	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Dibenz(a,h)anthracene	91	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Dibenzofuran	46	ug/kg	U	DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Fluoranthene	1400	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Fluorene	54	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Indeno(1,2,3-cd)pyrene	280	ug/kg		DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Naphthalene	46	ug/kg	U	DNR	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Phenanthrene	490	ug/kg		J	SW8270DSIM
BC-Dup-05212010	QX76GRE	Sediment	Pyrene	1700	ug/kg		J	SW8270DSIM
BC-1-2	QX76H	Sediment	Sulfide	10.2	mg/kg		J	EPA376.2
BC-1-2	QX76H	Sediment	Dibutyltin Ion	14	ug/kg	U	UJ	KRONE89
BC-1-2	QX76H	Sediment	1,2,4-Trichlorobenzene	680	ug/kg	U	DNR	SW8260C
BC-2-2	QX76I	Sediment	Sulfide	1.11	mg/kg	U	UJ	EPA376.2
BC-2-2	QX76I	Sediment	Dibutyltin Ion	82	ug/kg		J	KRONE89
BC-3-2	QX76J	Sediment	Sulfide	1.1	mg/kg	U	UJ	EPA376.2
BC-3-2	QX76J	Sediment	Dibutyltin Ion	5.2	ug/kg	U	UJ	KRONE89
BC-4-2	QX76K	Sediment	Sulfide	273	mg/kg		J	EPA376.2
BC-4-2	QX76K	Sediment	Dibutyltin Ion	5.2	ug/kg	U	UJ	KRONE89
BC-5-2	QX76L	Sediment	Sulfide	137	mg/kg		J	EPA376.2

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-5-2	QX76L	Sediment	Dibutyltin Ion	5.4	ug/kg	U	UJ	KRONE89
BC-6-2	QX76M	Sediment	Sulfide	155	mg/kg		J	EPA376.2
BC-6-2	QX76M	Sediment	Dibutyltin Ion	4.7	ug/kg	U	UJ	KRONE89
BC-ER-05212010	QX76N	Water	1,2,4-Trichlorobenzene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	1,2-Dichlorobenzene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	1,4-Dichlorobenzene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	2-Methylnaphthalene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Acenaphthene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Acenaphthylene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Anthracene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Benzo(a)anthracene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Benzo(a)pyrene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Benzo(b)fluoranthene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Benzo(g,h,i)perylene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Benzo(k)fluoranthene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Chrysene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Dibenz(a,h)anthracene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Dibenzofuran	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Fluoranthene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Fluorene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Hexachlorobenzene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Hexachlorobutadiene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Indeno(1,2,3-cd)pyrene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Naphthalene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Phenanthrene	1	ug/l	U	DNR	SW8270D
BC-ER-05212010	QX76N	Water	Pyrene	1	ug/l	U	DNR	SW8270D
BC-1-1	QY09A	Porewater	Dibutyltin Ion	0.6	ug/L	E	DNR	KRONE89
BC-1-1	QY09A	Porewater	Tributyltin Ion	2.8	ug/L	E	DNR	KRONE89
BC-1-1	QY09ARE	Porewater	Butyltin	0.23	ug/L		DNR	KRONE89
BC-2-1	QY09B	Porewater	Butyltin	1.3	ug/L	E	DNR	KRONE89
BC-2-1	QY09B	Porewater	Dibutyltin Ion	4.7	ug/L	E	DNR	KRONE89
BC-2-1	QY09B	Porewater	Tributyltin Ion	7.4	ug/L	E	DNR	KRONE89
BC-3-1	QY09C	Porewater	Butyltin	0.38	ug/L		J	KRONE89
BC-3-1	QY09C	Porewater	Tributyltin Ion	24	ug/L	E	DNR	KRONE89
BC-3-1	QY09CRE	Porewater	Butyltin	0.82	ug/L	U	DNR	KRONE89
BC-3-1	QY09CRE	Porewater	Dibutyltin Ion	2	ug/L		DNR	KRONE89
BC-3-1	QY09CRE	Porewater	Tributyltin Ion	15	ug/L		J	KRONE89
BC-4-1	QY09D	Porewater	Tributyltin Ion	2.8	ug/L	E	DNR	KRONE89
BC-4-1	QY09DRE	Porewater	Butyltin	0.25	ug/L		DNR	KRONE89
BC-4-1	QY09DRE	Porewater	Dibutyltin Ion	0.7	ug/L		DNR	KRONE89
BC-5-1	QY09E	Porewater	Tributyltin Ion	1	ug/L	E	DNR	KRONE89
BC-5-1	QY09ERE	Porewater	Butyltin	0.1	ug/L		DNR	KRONE89
BC-5-1	QY09ERE	Porewater	Dibutyltin Ion	0.24	ug/L		DNR	KRONE89
BC-DUP-05212010	QY09G	Porewater	Butyltin	0.69	ug/L		J	KRONE89
BC-DUP-05212010	QY09G	Porewater	Dibutyltin Ion	3	ug/L	E	DNR	KRONE89
BC-DUP-05212010	QY09G	Porewater	Tributyltin Ion	4.9	ug/L	E	DNR	KRONE89
BC-DUP-05212010	QY09GRE	Porewater	Butyltin	0.53	ug/L		DNR	KRONE89
BC-DUP-05212010	QY09GRE	Porewater	Tributyltin Ion	4.2	ug/L		J	KRONE89
BC-1-2	RA03D	Sediment	Diesel Range Organics	7400	ug/kg	E	DNR	NWTPH-Dx
BC-1-2	RA03DRE	Sediment	Lube Oil	1200	mg/kg	U	DNR	NWTPH-Dx
BC-10-2	RA03G	Sediment	Diesel Range Organics	8300	ug/kg	E	DNR	NWTPH-Dx
BC-10-2	RA03GRE	Sediment	Lube Oil	580	mg/kg	U	DNR	NWTPH-Dx
BC-1-2	RA87A	Sediment	Copper	17.9	mg/kg		J	SW6010B
BC-1-2	RA87A	Sediment	Lead	7	mg/kg		J	SW6010B
BC-1-2	RA87A	Sediment	Aroclor 1248	9.8	ug/kg	Y	UJ	SW8082
BC-1-2	RA87A	Sediment	1,2-Dichlorobenzene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	1,4-Dichlorobenzene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Acenaphthene	2200	ug/kg		DNR	SW8270D
BC-1-2	RA87A	Sediment	Anthracene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Benzo(a)pyrene	180	ug/kg	J	DNR	SW8270D
BC-1-2	RA87A	Sediment	Benzo(b)fluoranthene	160	ug/kg	J	J	SW8270D
BC-1-2	RA87A	Sediment	Benzo(g,h,i)perylene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Benzo(k)fluoranthene	160	ug/kg	J	J	SW8270D
BC-1-2	RA87A	Sediment	Dibenz(a,h)anthracene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Fluoranthene	4400	ug/kg		DNR	SW8270D
BC-1-2	RA87A	Sediment	Fluorene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Hexachlorobenzene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Hexachlorobutadiene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Indeno(1,2,3-cd)pyrene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Naphthalene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	Phenanthrene	320	ug/kg	U	DNR	SW8270D
BC-1-2	RA87A	Sediment	2-Methylnaphthalene	210	ug/kg	Y	DNR	SW8270DSIM
BC-1-2	RA87A	Sediment	Acenaphthylene	550	ug/kg	Y	DNR	SW8270DSIM
BC-1-2	RA87A	Sediment	Benzo(a)anthracene	590	ug/kg		DNR	SW8270DSIM
BC-1-2	RA87A	Sediment	Chrysene	530	ug/kg		DNR	SW8270DSIM
BC-1-2	RA87A	Sediment	Dibenzofuran	540	ug/kg		DNR	SW8270DSIM
BC-1-2	RA87A	Sediment	Fluorene	220	ug/kg	Y	UJ	SW8270DSIM
BC-1-2	RA87A	Sediment	Pyrene	2200	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Copper	33.8	mg/kg		J	SW6010B
BC-2-2	RA87B	Sediment	Lead	6	mg/kg		J	SW6010B

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Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-2-2	RA87B	Sediment	1,2,4-Trichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	1,2-Dichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	1,4-Dichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	2-Methylnaphthalene	14	ug/kg	J	DNR	SW8270D
BC-2-2	RA87B	Sediment	Acenaphthene	10	ug/kg	J	DNR	SW8270D
BC-2-2	RA87B	Sediment	Acenaphthylene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	Anthracene	59	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Benzo(a)anthracene	320	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Benzo(a)pyrene	100	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Benzo(g,h,i)perylene	23	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Benzoic Acid	190	ug/kg	U	UJ	SW8270D
BC-2-2	RA87B	Sediment	Chrysene	330	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Dibenz(a,h)anthracene	12	ug/kg	J	J	SW8270D
BC-2-2	RA87B	Sediment	Fluoranthene	600	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Hexachlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	Hexachlorobutadiene	19	ug/kg	U	DNR	SW8270D
BC-2-2	RA87B	Sediment	Indeno(1,2,3-cd)pyrene	28	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Naphthalene	14	ug/kg	J	DNR	SW8270D
BC-2-2	RA87B	Sediment	Phenanthrene	60	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Pyrene	450	ug/kg		DNR	SW8270D
BC-2-2	RA87B	Sediment	Benzo(a)anthracene	1300	ug/kg	E	DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Chrysene	1200	ug/kg	E	DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Dibenzofuran	14	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Fluoranthene	760	ug/kg	E	DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Fluorene	20	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87B	Sediment	Pyrene	680	ug/kg	E	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	2-Methylnaphthalene	23	ug/kg	U	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Acenaphthene	23	ug/kg	U	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Acenaphthylene	23	ug/kg	U	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Anthracene	240	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Benzo(a)pyrene	470	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Benzo(g,h,i)perylene	79	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Dibenz(a,h)anthracene	49	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Dibenzofuran	23	ug/kg	U	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Fluorene	23	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Indeno(1,2,3-cd)pyrene	98	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Naphthalene	23	ug/kg	U	DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Phenanthrene	60	ug/kg		DNR	SW8270DSIM
BC-2-2	RA87BRE	Sediment	Total Benzofluoranthenes	970	ug/kg		DNR	SW8270DSIM
BC-3-2	RA87C	Sediment	Copper	21.3	mg/kg		J	SW6010B
BC-3-2	RA87C	Sediment	Lead	3	mg/kg		J	SW6010B
BC-3-2	RA87C	Sediment	1,2,4-Trichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	1,2-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	1,4-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	2-Methylnaphthalene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Acenaphthene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Acenaphthylene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Anthracene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Benzo(a)anthracene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Benzo(a)pyrene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Benzo(g,h,i)perylene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Chrysene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Dibenz(a,h)anthracene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Dibenzofuran	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Fluoranthene	34	ug/kg		DNR	SW8270D
BC-3-2	RA87C	Sediment	Fluorene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Hexachlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Hexachlorobutadiene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Indeno(1,2,3-cd)pyrene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Naphthalene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Phenanthrene	20	ug/kg	U	DNR	SW8270D
BC-3-2	RA87C	Sediment	Pyrene	49	ug/kg		DNR	SW8270D
BC-4-2	RA87D	Sediment	Copper	26	mg/kg		J	SW6010B
BC-4-2	RA87D	Sediment	Lead	21	mg/kg		J	SW6010B
BC-4-2	RA87D	Sediment	1,2,4-Trichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	1,2-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	1,4-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	2-Methylnaphthalene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	Acenaphthene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	Acenaphthylene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	Anthracene	74	ug/kg		DNR	SW8270D
BC-4-2	RA87D	Sediment	Benzo(g,h,i)perylene	22	ug/kg		DNR	SW8270D
BC-4-2	RA87D	Sediment	Dibenz(a,h)anthracene	10	ug/kg	J	J	SW8270D
BC-4-2	RA87D	Sediment	Dibenzofuran	12	ug/kg	J	DNR	SW8270D
BC-4-2	RA87D	Sediment	Fluoranthene	370	ug/kg		DNR	SW8270D
BC-4-2	RA87D	Sediment	Fluorene	16	ug/kg	J	DNR	SW8270D
BC-4-2	RA87D	Sediment	Hexachlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	Hexachlorobutadiene	20	ug/kg	U	DNR	SW8270D
BC-4-2	RA87D	Sediment	Naphthalene	13	ug/kg	J	DNR	SW8270D
BC-4-2	RA87D	Sediment	Phenanthrene	46	ug/kg		DNR	SW8270D

Table 2
Everett Shipyard - May+June 2010 Sediment Sampling
Summary of Qualified Data

Sample ID	Laboratory ID	Matrix	Analyte	Result	Units	Laboratory Qualifier	Data Validation Qualifier	Analytical Method
BC-4-2	RA87D	Sediment	Pyrene	260	ug/kg		DNR	SW8270D
BC-4-2	RA87D	Sediment	Benzo(a)anthracene	170	ug/kg		DNR	SW8270DSIM
BC-4-2	RA87D	Sediment	Benzo(a)pyrene	58	ug/kg		DNR	SW8270DSIM
BC-4-2	RA87D	Sediment	Chrysene	160	ug/kg		DNR	SW8270DSIM
BC-4-2	RA87D	Sediment	Dibenz(a,h)anthracene	9.4	ug/kg		DNR	SW8270DSIM
BC-4-2	RA87D	Sediment	Indeno(1,2,3-cd)pyrene	22	ug/kg		DNR	SW8270DSIM
BC-5-2	RA87E	Sediment	Copper	24.9	mg/kg		J	SW6010B
BC-5-2	RA87E	Sediment	Lead	21	mg/kg		J	SW6010B
BC-5-2	RA87E	Sediment	1,2,4-Trichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	1,2-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	1,4-Dichlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	2-Methylnaphthalene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	Acenaphthene	170	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Acenaphthylene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	Anthracene	67	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Benzo(a)pyrene	39	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Benzo(g,h,i)perylene	18	ug/kg	J	DNR	SW8270D
BC-5-2	RA87E	Sediment	Dibenz(a,h)anthracene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	Dibenzofuran	32	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Fluorene	64	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Hexachlorobenzene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	Hexachlorobutadiene	20	ug/kg	U	DNR	SW8270D
BC-5-2	RA87E	Sediment	Indeno(1,2,3-cd)pyrene	19	ug/kg	J	DNR	SW8270D
BC-5-2	RA87E	Sediment	Naphthalene	23	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Phenanthrene	130	ug/kg		DNR	SW8270D
BC-5-2	RA87E	Sediment	Benzo(a)anthracene	74	ug/kg		DNR	SW8270DSIM
BC-5-2	RA87E	Sediment	Chrysene	86	ug/kg		DNR	SW8270DSIM
BC-5-2	RA87E	Sediment	Fluoranthene	330	ug/kg		DNR	SW8270DSIM
BC-5-2	RA87E	Sediment	Pyrene	270	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87F	Sediment	Copper	23.2	mg/kg		J	SW6010B
BC-6-2	RA87F	Sediment	Lead	17	mg/kg		J	SW6010B
BC-6-2	RA87F	Sediment	1,2,4-Trichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	1,2-Dichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	1,4-Dichlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	2-Methylnaphthalene	29	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Acenaphthene	95	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Acenaphthylene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	Anthracene	56	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Benzo(a)anthracene	30	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Benzo(a)pyrene	22	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Benzo(g,h,i)perylene	14	ug/kg	J	DNR	SW8270D
BC-6-2	RA87F	Sediment	bis(2-Ethylhexyl)phthalate	13	ug/kg	J	J	SW8270D
BC-6-2	RA87F	Sediment	Chrysene	42	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Dibenzofuran	51	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Fluoranthene	280	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Fluorene	190	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Hexachlorobenzene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	Hexachlorobutadiene	19	ug/kg	U	DNR	SW8270D
BC-6-2	RA87F	Sediment	Indeno(1,2,3-cd)pyrene	10	ug/kg	J	DNR	SW8270D
BC-6-2	RA87F	Sediment	Naphthalene	46	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Phenanthrene	420	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Pyrene	190	ug/kg		DNR	SW8270D
BC-6-2	RA87F	Sediment	Phenanthrene	680	ug/kg	E	DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	2-Methylnaphthalene	120	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Acenaphthene	260	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Acenaphthylene	14	ug/kg	U	DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Anthracene	100	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Benzo(a)anthracene	43	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Benzo(a)pyrene	28	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Benzo(g,h,i)perylene	18	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Chrysene	52	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Dibenz(a,h)anthracene	14	ug/kg	U	DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Dibenzofuran	180	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Fluoranthene	390	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Fluorene	420	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Indeno(1,2,3-cd)pyrene	14	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Naphthalene	250	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Pyrene	250	ug/kg		DNR	SW8270DSIM
BC-6-2	RA87FRE	Sediment	Total Benzofluoranthenes	47	ug/kg		DNR	SW8270DSIM

Memo

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To:	Jim Flynn, Project Manager	**Info:**	**FINAL**
From:	Jennifer Garner, Project Chemist	**Date:**	July 30, 2010
SUBJECT:	**Summary Data Quality Review Everett Shipyard RI/FS Soil and Groundwater Sampling – 2010**		

The summary data quality review of 42 soil samples, 4 groundwater samples, 2 rinsate blanks, and 1 trip blank collected between June 24 and June 25, 2010 has been completed. The samples were collected by URS personnel and were analyzed at the Analytical Resources, Incorporated (ARI) laboratory in Tukwila, Washington for total petroleum hydrocarbons (TPH, diesel-range and motor oil-range) by Washington State Department of Ecology Method NWTPH-Dx and/or volatile organic compounds (VOCs) by EPA Method 8260C as described in Table 1. The analyses were performed in general accordance with the methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846), Update IIIB*, June 2005 and Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997. The laboratory provided summary data packages containing summarized sample results and associated QA/QC data for all samples. Samples were logged into ARI sample delivery groups (SDGs) RC22, RC23, and RC24.

Table 1 – Summary of Analytical Parameters

Sample ID	Laboratory ID	Matrix	Requested Analyses
SB-97-11	RC22A	Soil	NWTPH-Dx
SB-97-14	RC22B	Soil	NWTPH-Dx
SB-98-6	RC22C	Soil	NWTPH-Dx
SB-98-10	RC22D	Soil	NWTPH-Dx
SB-98-15	RC22E	Soil	NWTPH-Dx
SB-93A-6	RC22F	Soil	NWTPH-Dx
SB-93A-10	RC22G	Soil	NWTPH-Dx
SB-93A-15	RC22H	Soil	NWTPH-Dx
SB-100-5	RC22I	Soil	NWTPH-Dx
SB-100-10	RC22J	Soil	NWTPH-Dx
SB-100-14	RC22K	Soil	NWTPH-Dx
SB-101-5	RC22L	Soil	NWTPH-Dx
SB-101-15	RC22M	Soil	NWTPH-Dx
SB-102-5	RC22N	Soil	NWTPH-Dx
SB-102-11	RC22O	Soil	NWTPH-Dx
SB-102-14	RC22P	Soil	NWTPH-Dx
SB-103-6	RC22Q	Soil	NWTPH-Dx
SB-103-10	RC22R	Soil	NWTPH-Dx
SB-103-13	RC22S	Soil	NWTPH-Dx
SB-104-5	RC22T	Soil	NWTPH-Dx
SB-93-8	RC23A	Soil	NWTPH-Dx
SB-93-10	RC23B	Soil	VOCs, NWTPH-Dx
SB-94-10	RC23C	Soil	VOCs, NWTPH-Dx

Table 1 – Summary of Analytical Parameters (continued)

Sample ID	Laboratory ID	Matrix	Requested Analyses
SB-94-15	RC23D	Soil	VOCs, NWTPH-Dx
SB-95-8	RC23E	Soil	VOCs, NWTPH-Dx
SB-95-11	RC23F	Soil	NWTPH-Dx
SB-95-14	RC23G	Soil	VOCs, NWTPH-Dx
SB-93-10-DUP (Field duplicate of SB-93-10)	RC23H	Soil	NWTPH-Dx
SB-93-14	RC23I	Soil	NWTPH-Dx
SB-94-5	RC23J	Soil	NWTPH-Dx
SB-96-8	RC23K	Soil	NWTPH-Dx
SB-96-11	RC23L	Soil	NWTPH-Dx
SB-96-14	RC23M	Soil	NWTPH-Dx
SB-97-7	RC23N	Soil	NWTPH-Dx
SB-93-GW	RC23O	Groundwater	VOCs, NWTPH-Dx
SB-94-GW	RC23P	Groundwater	VOCs, NWTPH-Dx
SB-94-GW-DUP (Field duplicate of SB-994-GW)	RC23Q	Groundwater	VOCs, NWTPH-Dx
SB-95-GW	RC23R	Groundwater	VOCs, NWTPH-Dx
SB-105-6	RC24A	Soil	NWTPH-Dx
SB-105-11	RC24B	Soil	NWTPH-Dx
SB-106-5	RC24C	Soil	NWTPH-Dx
SB-106-10	RC24D	Soil	NWTPH-Dx
SB-106-14	RC24E	Soil	NWTPH-Dx
SB-107-5	RC24F	Soil	NWTPH-Dx
SB-107-10	RC24G	Soil	NWTPH-Dx
SB-107-13	RC24H	Soil	NWTPH-Dx
EQB-1 (Rinsate blank)	RC24I	Water	VOCs, NWTPH-Dx
EQB-2 (Rinsate blank)	RC24J	Water	VOCs, NWTPH-Dx
Trip Blank	RC24K	Water	VOCs

Upon receipt by ARI, the sample jar information was compared to the associated chain-of-custody (COC). Samples SB-93A-6, SB-93-10, SB-93-15, SB-101-5, SB-101-15, SB-96-14, and SB-105-6 were incorrectly listed on the sample bottles as SB-92A-6, SB-92-10, SB-92-15, SB-100-5, SB-100-15, SB-97-14 and SB-105-5. After confirmation with URS Corporation, the samples were reported using the correct sample IDs. Analysis for VOC total solids was cancelled for all samples that did not require VOC analysis.

The coolers exceeded the EPA-recommended limits of 4°C±2°C at 22.6°C and 21.8°C. The results for all diesel-range and motor oil-range TPHs are qualified as estimated and flagged 'J' if reported as detected or 'UJ' if reported as not detected based on the elevated cooler temperature. The results for all VOCs are qualified as estimated and flagged 'J' if reported as detected or rejected and flagged 'R' if reported as not detected based on the elevated cooler temperatures.

The laboratory noted the presence of small to pea-sized air bubbles present in one or more VOA vials submitted for SB-94-GW, SB-94-GW-DUP, SB-95-GW, and the trip blank. Data were not qualified in these samples based on the presence of small to pea-sized air bubbles. The laboratory noted that 5 vials submitted for SB-93-GW contained large air bubbles, and the remaining vial contained a small air bubble. Per laboratory standard operating procedures, the laboratory used the VOA vial with a small air bubble. Data were not qualified based on the presence of air bubbles in this sample.

Data validation is based on method performance criteria and QC criteria documented in the Quality Assurance Project Plan (QAPP) of the *Final Remedial Investigation Feasibility Study Work Plan, Everett Shipyard, 1016-14th Street, Everett, Washington*, dated October 31, 2008 (RI/FS Work Plan). Hold times, field and method blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, field and laboratory duplicate results, blank spike recoveries (laboratory control samples), and reporting limits were reviewed to assess compliance with applicable methods. If data qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA document *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review,* June 2008. A summary of data qualifiers assigned to these results is presented in Table 2.

Organic Analysis

Samples were analyzed for TPHs and/or VOCs by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Blanks – Acceptable except as noted below:

   VOCs by Method 8260C – Methylene chloride was detected in EQB-1 (0.5 ug/L) and EQB-2 (0.6 ug/L). Methylene chloride was not detected in the samples associated with these rinsate blanks; therefore, data were not qualified based on the rinsate blank results.

3. Surrogates – Acceptable except as noted below:

   NWTPH-Dx – o-Terphenyl was not recovered from SB-93-8, the dilution performed on SB-93-8, SB-94-15, SB-95-8, the dilution performed on SB-95-8, SB-96-8, the dilution performed on SB-96-8, SB-96-11, SB-96-14, and the matrix spike and matrix spike duplicate performed on SB-96-14. The results for diesel-range and motor oil-range TPH were previously qualified in all samples based on the elevated cooler temperatures and no further qualification based on the surrogates is required.

4. Laboratory Control/Laboratory Control Duplicate Samples (LCS/LCSD) – Acceptable

5. Matrix Spike / Matrix Spike Duplicates (MS/MSD) – Acceptable except as noted below:

   NWTPH-Dx – MS/MSDs were performed on samples SB-104-5, SB-107-5, and SB-93-GW. Results were acceptable.

   Diesel was not recovered from the MS/MSD performed on SB-96-14. As the diesel-range TPH concentration was more than 4 times (4x) the spike concentration, data were not qualified based on the MS/MSD results.

   VOCs by Method 8260C – A MS/MSD was not performed in association with the soil samples. Precision and accuracy were assessed using the LCS/LCSD results.

   A MS/MSD was performed on SB-93-GW in association with the groundwater samples. The percent recovery for trans-1,4-dichloro-2-butene in the MSD (67.0%) was below the control limits of 70-129%. As the percent recovery in the MS and the relative percent difference (RPD) for the MS/MSD pair were acceptable, data were not qualified for trans-1,4-dichloro-2-butene based on the MSD result.

   2-Chloroethylvinylether (2-CVE) was not recovered from the MS/MSD. 2-CVE has been documented to be unstable in the presence of acids; even dilute acids will produce hydrolysis of 2-CVE to acetaldehyde and 2-chloroethanol. Soil and water VOC samples are preserved with acid. Any 2-CVE which may have been present is therefore likely to react with the acid used for sample preservation. Therefore, the results for 2-CVE in all samples associated with these SDGs are qualified as rejected and flagged 'R.'

6. Field Duplicates – Acceptable where applicable except as noted below:

   General – Field duplicates were submitted for SB-93-10 and SB-94-GW and identified as SB-93-10-DUP and SB-94-GW-DUP, respectively. Results were acceptable for the associated analyses except as noted.

NWTPH-Dx – The RPD diesel-range TPH (76%) for the parent sample / field duplicate pair SB-94-GW /SB-94-GW-DUP was more than 50%. The results diesel-range TPH in SB-94-GW and SB/94-GW-DUP were previously qualified as estimated based on the elevated cooler temperatures and no further qualification based on the field duplicate RPD is required.

7. Reporting Limits – Acceptable except as noted below:

NWTPH-Dx – The reporting limits for diesel-range and/or motor oil-range TPH in several samples were elevated due to the percent moisture content of the samples and/or dilutions for high concentrations of TPH present in the samples. The elevated reporting limits are below screening levels and do not affect the use of the data for regulatory comparison.

The results for diesel-range TPH in several samples exceeded the linear range of the instrument and were flagged 'E' by the laboratory. The laboratory re-analyzed these samples at dilutions. The 'E' flagged diesel-range TPH results in the initial analyses of these samples are qualified 'DNR' for Do Not Report and will not be used. The results for motor oil-range TPH in the dilutions of these samples are flagged 'DNR' and will not be used.

VOCs by 8260C – The reporting limits for one or more VOCs in SB-94-15, SB-95-8, and SB-95-14 were elevated due to the percent moisture content of the samples and/or dilutions for high concentrations of TPH present in the samples. The elevated reporting limits may affect the use of the data for regulatory comparison.

One or more VOCs were flagged 'M' or 'Y' by the laboratory to indicate elevated results due to matrix interference. These results were previously qualified based on the elevated cooler temperatures and no further qualification based on the laboratory flags is required.

8. Other items of note:

NWTPH-Dx – All diesel-range and motor oil-range TPH results reported as detected were positively identified by the laboratory as containing diesel and/or motor oil, respectively.

Overall Assessment of Data

The completeness for ARI SDGs RC22, RC23, and RC24 is greater than 14%. The usefulness of this data is based on USEPA guidance documents listed in the introduction to this report. Upon consideration of the information presented above, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-97-11	RC22A	Diesel Range Organics	96		J	mg/kg
SB-97-11	RC22A	Lube Oil	13	U	UJ	mg/kg
SB-97-14	RC22B	Diesel Range Organics	2600	E	DNR	mg/kg
SB-97-14	RC22B	Lube Oil	110		J	mg/kg
SB-97-14	RC22BRE	Diesel Range Organics	2800		J	mg/kg
SB-97-14	RC22BRE	Lube Oil	610	U	DNR	mg/kg
SB-98-6	RC22C	Diesel Range Organics	5.1	U	UJ	mg/kg
SB-98-6	RC22C	Lube Oil	10	U	UJ	mg/kg
SB-98-10	RC22D	Diesel Range Organics	590	E	DNR	mg/kg
SB-98-10	RC22D	Lube Oil	120		J	mg/kg
SB-98-10	RC22DRE	Diesel Range Organics	560		J	mg/kg
SB-98-10	RC22DRE	Lube Oil	120		DNR	mg/kg
SB-98-15	RC22E	Diesel Range Organics	23		J	mg/kg
SB-98-15	RC22E	Lube Oil	13	U	UJ	mg/kg
SB-93A-6	RC22F	Diesel Range Organics	6.9	U	UJ	mg/kg
SB-93A-6	RC22F	Lube Oil	14	U	UJ	mg/kg
SB-93A-10	RC22G	Diesel Range Organics	6.6	U	UJ	mg/kg
SB-93A-10	RC22G	Lube Oil	13	U	UJ	mg/kg
SB-93A-15	RC22H	Diesel Range Organics	6.2	U	UJ	mg/kg
SB-93A-15	RC22H	Lube Oil	12	U	UJ	mg/kg
SB-100-5	RC22I	Diesel Range Organics	2000	E	DNR	mg/kg
SB-100-5	RC22I	Lube Oil	100		J	mg/kg
SB-100-5	RC22IRE	Diesel Range Organics	2000		J	mg/kg
SB-100-5	RC22IRE	Lube Oil	220	U	DNR	mg/kg
SB-100-10	RC22J	Diesel Range Organics	4600	E	DNR	mg/kg
SB-100-10	RC22J	Lube Oil	210		J	mg/kg
SB-100-10	RC22JRE	Diesel Range Organics	4600		J	mg/kg
SB-100-10	RC22JRE	Lube Oil	620	U	DNR	mg/kg
SB-100-14	RC22K	Diesel Range Organics	2800	E	DNR	mg/kg
SB-100-14	RC22K	Lube Oil	180		J	mg/kg
SB-100-14	RC22KRE	Diesel Range Organics	2800		J	mg/kg
SB-100-14	RC22KRE	Lube Oil	620	U	DNR	mg/kg
SB-101-5	RC22L	Diesel Range Organics	1900	E	DNR	mg/kg
SB-101-5	RC22L	Lube Oil	77		J	mg/kg
SB-101-5	RC22LRE	Diesel Range Organics	2000		J	mg/kg
SB-101-5	RC22LRE	Lube Oil	220	U	DNR	mg/kg
SB-101-15	RC22M	Diesel Range Organics	3100	E	DNR	mg/kg
SB-101-15	RC22M	Lube Oil	190		J	mg/kg
SB-101-15	RC22MRE	Diesel Range Organics	3100		J	mg/kg
SB-101-15	RC22MRE	Lube Oil	640	U	DNR	mg/kg
SB-102-5	RC22N	Diesel Range Organics	8000	E	DNR	mg/kg
SB-102-5	RC22N	Lube Oil	350		J	mg/kg
SB-102-5	RC22NRE	Diesel Range Organics	8400		J	mg/kg
SB-102-5	RC22NRE	Lube Oil	1100	U	DNR	mg/kg
SB-102-11	RC22O	Diesel Range Organics	4700	E	DNR	mg/kg
SB-102-11	RC22O	Lube Oil	200		J	mg/kg
SB-102-11	RC22ORE	Diesel Range Organics	4800		J	mg/kg
SB-102-11	RC22ORE	Lube Oil	590	U	DNR	mg/kg
SB-102-14	RC22P	Diesel Range Organics	1300	E	DNR	mg/kg
SB-102-14	RC22P	Lube Oil	54		J	mg/kg
SB-102-14	RC22PRE	Diesel Range Organics	1300		J	mg/kg
SB-102-14	RC22PRE	Lube Oil	130	U	DNR	mg/kg
SB-103-6	RC22Q	Diesel Range Organics	6.2	U	UJ	mg/kg
SB-103-6	RC22Q	Lube Oil	12	U	UJ	mg/kg
SB-103-10	RC22R	Diesel Range Organics	6.4	U	UJ	mg/kg
SB-103-10	RC22R	Lube Oil	13	U	UJ	mg/kg
SB-103-13	RC22S	Diesel Range Organics	1300	E	DNR	mg/kg
SB-103-13	RC22S	Lube Oil	45		J	mg/kg
SB-103-13	RC22SRE	Diesel Range Organics	1300		J	mg/kg
SB-103-13	RC22SRE	Lube Oil	130	U	DNR	mg/kg
SB-104-5	RC22T	Diesel Range Organics	6.7		J	mg/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-104-5	RC22T	Lube Oil	10	U	UJ	mg/kg
SB-93-8	RC23A	Diesel Range Organics	1900	E	DNR	mg/kg
SB-93-8	RC23A	Lube Oil	110		J	mg/kg
SB-93-8	RC23ARE	Diesel Range Organics	1900		J	mg/kg
SB-93-8	RC23ARE	Lube Oil	640	U	DNR	mg/kg
SB-93-10	RC23B	Diesel Range Organics	25		J	mg/kg
SB-93-10	RC23B	Lube Oil	14	U	UJ	mg/kg
SB-93-10	RC23B	Chloromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Bromomethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Vinyl Chloride	0.7	U	R	ug/kg
SB-93-10	RC23B	Chloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Methylene Chloride	1.3	U	R	ug/kg
SB-93-10	RC23B	Acetone	27		J	ug/kg
SB-93-10	RC23B	Carbon Disulfide	4.9		J	ug/kg
SB-93-10	RC23B	1,1-Dichloroethene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,1-Dichloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	trans-1,2-Dichloroethene	0.7	U	R	ug/kg
SB-93-10	RC23B	cis-1,2-Dichloroethene	0.7	U	R	ug/kg
SB-93-10	RC23B	Chloroform	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2-Dichloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	2-Butanone	3.3	U	R	ug/kg
SB-93-10	RC23B	1,1,1-Trichloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Carbon Tetrachloride	0.7	U	R	ug/kg
SB-93-10	RC23B	Vinyl Acetate	3.3	U	R	ug/kg
SB-93-10	RC23B	Bromodichloromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2-Dichloropropane	0.7	U	R	ug/kg
SB-93-10	RC23B	cis-1,3-Dichloropropene	0.7	U	R	ug/kg
SB-93-10	RC23B	Trichloroethene	0.7	U	R	ug/kg
SB-93-10	RC23B	Dibromochloromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,1,2-Trichloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Benzene	1.4		J	ug/kg
SB-93-10	RC23B	trans-1,3-Dichloropropene	0.7	U	R	ug/kg
SB-93-10	RC23B	2-Chloroethylvinylether	3.3	U	R	ug/kg
SB-93-10	RC23B	Bromoform	0.7	U	R	ug/kg
SB-93-10	RC23B	4-Methyl-2-Pentanone (MIBK)	3.3	U	R	ug/kg
SB-93-10	RC23B	2-Hexanone	3.3	U	R	ug/kg
SB-93-10	RC23B	Tetrachloroethene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,1,2,2-Tetrachloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Toluene	0.7	U	R	ug/kg
SB-93-10	RC23B	Chlorobenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	Ethylbenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	Styrene	0.7	U	R	ug/kg
SB-93-10	RC23B	Trichlorofluoromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,1,2-Trichloro-1,2,2-trifluoroethane	1.3	U	R	ug/kg
SB-93-10	RC23B	m, p-Xylene	1		J	ug/kg
SB-93-10	RC23B	o-Xylene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2-Dichlorobenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,3-Dichlorobenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,4-Dichlorobenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	Acrolein	33	U	R	ug/kg
SB-93-10	RC23B	Methyl Iodide	0.7	U	R	ug/kg
SB-93-10	RC23B	Bromoethane	1.3	U	R	ug/kg
SB-93-10	RC23B	Acrylonitrile	3.3	U	R	ug/kg
SB-93-10	RC23B	1,1-Dichloropropene	0.7	U	R	ug/kg
SB-93-10	RC23B	Dibromomethane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,1,1,2-Tetrachloroethane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2-Dibromo-3-chloropropane	3.3	U	R	ug/kg
SB-93-10	RC23B	1,2,3-Trichloropropane	1.3	U	R	ug/kg
SB-93-10	RC23B	trans-1,4-Dichloro-2-butene	3.3	U	R	ug/kg
SB-93-10	RC23B	1,3,5-Trimethylbenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2,4-Trimethylbenzene	0.7	U	R	ug/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-93-10	RC23B	Hexachlorobutadiene	3.3	U	R	ug/kg
SB-93-10	RC23B	Ethylene Dibromide	0.7	U	R	ug/kg
SB-93-10	RC23B	Bromochloromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	Dichlorodifluoromethane	0.7	U	R	ug/kg
SB-93-10	RC23B	2,2-Dichloropropane	0.7	U	R	ug/kg
SB-93-10	RC23B	1,3-Dichloropropane	0.7	U	R	ug/kg
SB-93-10	RC23B	Isopropylbenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	n-Propylbenzene	0.8		J	ug/kg
SB-93-10	RC23B	Bromobenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	2-Chlorotoluene	0.7	U	R	ug/kg
SB-93-10	RC23B	4-Chlorotoluene	0.7	U	R	ug/kg
SB-93-10	RC23B	tert-Butylbenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	sec-Butylbenzene	1.1		J	ug/kg
SB-93-10	RC23B	4-Isopropyltoluene	0.7	U	R	ug/kg
SB-93-10	RC23B	n-Butylbenzene	0.7	U	R	ug/kg
SB-93-10	RC23B	1,2,4-Trichlorobenzene	3.3	U	R	ug/kg
SB-93-10	RC23B	Naphthalene	3.3	U	R	ug/kg
SB-93-10	RC23B	1,2,3-Trichlorobenzene	3.3	U	R	ug/kg
SB-93-10	RC23B	Methyl tert-Butyl Ether	0.7	U	R	ug/kg
SB-94-10	RC23C	Diesel Range Organics	200		J	mg/kg
SB-94-10	RC23C	Lube Oil	12	U	UJ	mg/kg
SB-94-10	RC23C	Chloromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Bromomethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Vinyl Chloride	0.7	U	R	ug/kg
SB-94-10	RC23C	Chloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Methylene Chloride	1.4	U	R	ug/kg
SB-94-10	RC23C	Acetone	3.6	U	R	ug/kg
SB-94-10	RC23C	Carbon Disulfide	5.1		J	ug/kg
SB-94-10	RC23C	1,1-Dichloroethene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,1-Dichloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	trans-1,2-Dichloroethene	0.7	U	R	ug/kg
SB-94-10	RC23C	cis-1,2-Dichloroethene	0.7	U	R	ug/kg
SB-94-10	RC23C	Chloroform	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2-Dichloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	2-Butanone	3.6	U	R	ug/kg
SB-94-10	RC23C	1,1,1-Trichloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Carbon Tetrachloride	0.7	U	R	ug/kg
SB-94-10	RC23C	Vinyl Acetate	3.6	U	R	ug/kg
SB-94-10	RC23C	Bromodichloromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2-Dichloropropane	0.7	U	R	ug/kg
SB-94-10	RC23C	cis-1,3-Dichloropropene	0.7	U	R	ug/kg
SB-94-10	RC23C	Trichloroethene	0.7	U	R	ug/kg
SB-94-10	RC23C	Dibromochloromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,1,2-Trichloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Benzene	1.4		J	ug/kg
SB-94-10	RC23C	trans-1,3-Dichloropropene	0.7	U	R	ug/kg
SB-94-10	RC23C	2-Chloroethylvinylether	3.6	U	R	ug/kg
SB-94-10	RC23C	Bromoform	0.7	U	R	ug/kg
SB-94-10	RC23C	4-Methyl-2-Pentanone (MIBK)	3.6	U	R	ug/kg
SB-94-10	RC23C	2-Hexanone	3.6	U	R	ug/kg
SB-94-10	RC23C	Tetrachloroethene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,1,2,2-Tetrachloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Toluene	0.9	M	J	ug/kg
SB-94-10	RC23C	Chlorobenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	Ethylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	Styrene	0.7	U	R	ug/kg
SB-94-10	RC23C	Trichlorofluoromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	R	ug/kg
SB-94-10	RC23C	m, p-Xylene	0.8		J	ug/kg
SB-94-10	RC23C	o-Xylene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2-Dichlorobenzene	0.7	U	R	ug/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-94-10	RC23C	1,3-Dichlorobenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,4-Dichlorobenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	Acrolein	36	U	R	ug/kg
SB-94-10	RC23C	Methyl Iodide	0.7	U	R	ug/kg
SB-94-10	RC23C	Bromoethane	1.4	U	R	ug/kg
SB-94-10	RC23C	Acrylonitrile	3.6	U	R	ug/kg
SB-94-10	RC23C	1,1-Dichloropropene	0.7	U	R	ug/kg
SB-94-10	RC23C	Dibromomethane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,1,1,2-Tetrachloroethane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2-Dibromo-3-chloropropane	3.6	U	R	ug/kg
SB-94-10	RC23C	1,2,3-Trichloropropane	1.4	U	R	ug/kg
SB-94-10	RC23C	trans-1,4-Dichloro-2-butene	3.6	U	R	ug/kg
SB-94-10	RC23C	1,3,5-Trimethylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2,4-Trimethylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	Hexachlorobutadiene	3.6	U	R	ug/kg
SB-94-10	RC23C	Ethylene Dibromide	0.7	U	R	ug/kg
SB-94-10	RC23C	Bromochloromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	Dichlorodifluoromethane	0.7	U	R	ug/kg
SB-94-10	RC23C	2,2-Dichloropropane	0.7	U	R	ug/kg
SB-94-10	RC23C	1,3-Dichloropropane	0.7	U	R	ug/kg
SB-94-10	RC23C	Isopropylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	n-Propylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	Bromobenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	2-Chlorotoluene	0.7	U	R	ug/kg
SB-94-10	RC23C	4-Chlorotoluene	0.7	U	R	ug/kg
SB-94-10	RC23C	tert-Butylbenzene	1.1	M	J	ug/kg
SB-94-10	RC23C	sec-Butylbenzene	3.3		J	ug/kg
SB-94-10	RC23C	4-Isopropyltoluene	0.7	U	R	ug/kg
SB-94-10	RC23C	n-Butylbenzene	0.7	U	R	ug/kg
SB-94-10	RC23C	1,2,4-Trichlorobenzene	3.6	U	R	ug/kg
SB-94-10	RC23C	Naphthalene	3.6	U	R	ug/kg
SB-94-10	RC23C	1,2,3-Trichlorobenzene	3.6	U	R	ug/kg
SB-94-10	RC23C	Methyl tert-Butyl Ether	0.7	U	R	ug/kg
SB-94-15	RC23D	Diesel Range Organics	1900	E	DNR	mg/kg
SB-94-15	RC23D	Lube Oil	80		J	mg/kg
SB-94-15	RC23DRE	Diesel Range Organics	1900		J	mg/kg
SB-94-15	RC23DRE	Lube Oil	250	U	DNR	mg/kg
SB-94-15	RC23D	Chloromethane	32	U	R	ug/kg
SB-94-15	RC23D	Bromomethane	32	U	R	ug/kg
SB-94-15	RC23D	Vinyl Chloride	32	U	R	ug/kg
SB-94-15	RC23D	Chloroethane	32	U	R	ug/kg
SB-94-15	RC23D	Methylene Chloride	64	U	R	ug/kg
SB-94-15	RC23D	Acetone	160	U	R	ug/kg
SB-94-15	RC23D	Carbon Disulfide	32	U	R	ug/kg
SB-94-15	RC23D	1,1-Dichloroethene	32	U	R	ug/kg
SB-94-15	RC23D	1,1-Dichloroethane	32	U	R	ug/kg
SB-94-15	RC23D	trans-1,2-Dichloroethene	32	U	R	ug/kg
SB-94-15	RC23D	cis-1,2-Dichloroethene	32	U	R	ug/kg
SB-94-15	RC23D	Chloroform	32	U	R	ug/kg
SB-94-15	RC23D	1,2-Dichloroethane	32	U	R	ug/kg
SB-94-15	RC23D	2-Butanone	160	U	R	ug/kg
SB-94-15	RC23D	1,1,1-Trichloroethane	32	U	R	ug/kg
SB-94-15	RC23D	Carbon Tetrachloride	32	U	R	ug/kg
SB-94-15	RC23D	Vinyl Acetate	160	U	R	ug/kg
SB-94-15	RC23D	Bromodichloromethane	32	U	R	ug/kg
SB-94-15	RC23D	1,2-Dichloropropane	32	U	R	ug/kg
SB-94-15	RC23D	cis-1,3-Dichloropropene	32	U	R	ug/kg
SB-94-15	RC23D	Trichloroethene	32	U	R	ug/kg
SB-94-15	RC23D	Dibromochloromethane	32	U	R	ug/kg
SB-94-15	RC23D	1,1,2-Trichloroethane	32	U	R	ug/kg
SB-94-15	RC23D	Benzene	32	U	R	ug/kg

Table 2
Summary of Qualified Data
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Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-94-15	RC23D	trans-1,3-Dichloropropene	32	U	R	ug/kg
SB-94-15	RC23D	2-Chloroethylvinylether	160	U	R	ug/kg
SB-94-15	RC23D	Bromoform	32	U	R	ug/kg
SB-94-15	RC23D	4-Methyl-2-Pentanone (MIBK)	160	U	R	ug/kg
SB-94-15	RC23D	2-Hexanone	160	U	R	ug/kg
SB-94-15	RC23D	Tetrachloroethene	32	U	R	ug/kg
SB-94-15	RC23D	1,1,2,2-Tetrachloroethane	32	U	R	ug/kg
SB-94-15	RC23D	Toluene	32	U	R	ug/kg
SB-94-15	RC23D	Chlorobenzene	32	U	R	ug/kg
SB-94-15	RC23D	Ethylbenzene	32	U	R	ug/kg
SB-94-15	RC23D	Styrene	32	U	R	ug/kg
SB-94-15	RC23D	Trichlorofluoromethane	32	U	R	ug/kg
SB-94-15	RC23D	1,1,2-Trichloro-1,2,2-trifluoroethane	64	U	R	ug/kg
SB-94-15	RC23D	m, p-Xylene	32	U	R	ug/kg
SB-94-15	RC23D	o-Xylene	32	U	R	ug/kg
SB-94-15	RC23D	1,2-Dichlorobenzene	32	U	R	ug/kg
SB-94-15	RC23D	1,3-Dichlorobenzene	32	U	R	ug/kg
SB-94-15	RC23D	1,4-Dichlorobenzene	32	U	R	ug/kg
SB-94-15	RC23D	Acrolein	1600	U	R	ug/kg
SB-94-15	RC23D	Methyl Iodide	32	U	R	ug/kg
SB-94-15	RC23D	Bromoethane	64	U	R	ug/kg
SB-94-15	RC23D	Acrylonitrile	160	U	R	ug/kg
SB-94-15	RC23D	1,1-Dichloropropene	32	U	R	ug/kg
SB-94-15	RC23D	Dibromomethane	32	U	R	ug/kg
SB-94-15	RC23D	1,1,1,2-Tetrachloroethane	32	U	R	ug/kg
SB-94-15	RC23D	1,2-Dibromo-3-chloropropane	160	U	R	ug/kg
SB-94-15	RC23D	1,2,3-Trichloropropane	64	U	R	ug/kg
SB-94-15	RC23D	trans-1,4-Dichloro-2-butene	160	U	R	ug/kg
SB-94-15	RC23D	1,3,5-Trimethylbenzene	32	U	R	ug/kg
SB-94-15	RC23D	1,2,4-Trimethylbenzene	32	U	R	ug/kg
SB-94-15	RC23D	Hexachlorobutadiene	160	U	R	ug/kg
SB-94-15	RC23D	Ethylene Dibromide	32	U	R	ug/kg
SB-94-15	RC23D	Bromochloromethane	32	U	R	ug/kg
SB-94-15	RC23D	Dichlorodifluoromethane	32	U	R	ug/kg
SB-94-15	RC23D	2,2-Dichloropropane	32	U	R	ug/kg
SB-94-15	RC23D	1,3-Dichloropropane	32	U	R	ug/kg
SB-94-15	RC23D	Isopropylbenzene	290		J	ug/kg
SB-94-15	RC23D	n-Propylbenzene	460		J	ug/kg
SB-94-15	RC23D	Bromobenzene	32	U	R	ug/kg
SB-94-15	RC23D	2-Chlorotoluene	32	U	R	ug/kg
SB-94-15	RC23D	4-Chlorotoluene	32	U	R	ug/kg
SB-94-15	RC23D	tert-Butylbenzene	32	U	R	ug/kg
SB-94-15	RC23D	sec-Butylbenzene	260		J	ug/kg
SB-94-15	RC23D	4-Isopropyltoluene	32	U	R	ug/kg
SB-94-15	RC23D	n-Butylbenzene	120		J	ug/kg
SB-94-15	RC23D	1,2,4-Trichlorobenzene	160	U	R	ug/kg
SB-94-15	RC23D	Naphthalene	160	U	R	ug/kg
SB-94-15	RC23D	1,2,3-Trichlorobenzene	160	U	R	ug/kg
SB-94-15	RC23D	Methyl tert-Butyl Ether	32	U	R	ug/kg
SB-95-8	RC23E	Diesel Range Organics	3000	E	DNR	mg/kg
SB-95-8	RC23E	Lube Oil	110		J	mg/kg
SB-95-8	RC23ERE	Diesel Range Organics	3100		J	mg/kg
SB-95-8	RC23ERE	Lube Oil	610	U	DNR	mg/kg
SB-95-8	RC23E	Chloromethane	37	U	R	ug/kg
SB-95-8	RC23E	Bromomethane	37	U	R	ug/kg
SB-95-8	RC23E	Vinyl Chloride	37	U	R	ug/kg
SB-95-8	RC23E	Chloroethane	37	U	R	ug/kg
SB-95-8	RC23E	Methylene Chloride	75	U	R	ug/kg
SB-95-8	RC23E	Acetone	190	U	R	ug/kg
SB-95-8	RC23E	Carbon Disulfide	37	U	R	ug/kg
SB-95-8	RC23E	1,1-Dichloroethene	37	U	R	ug/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-95-8	RC23E	1,1-Dichloroethane	37	U	R	ug/kg
SB-95-8	RC23E	trans-1,2-Dichloroethene	37	U	R	ug/kg
SB-95-8	RC23E	cis-1,2-Dichloroethene	37	U	R	ug/kg
SB-95-8	RC23E	Chloroform	37	U	R	ug/kg
SB-95-8	RC23E	1,2-Dichloroethane	37	U	R	ug/kg
SB-95-8	RC23E	2-Butanone	190	U	R	ug/kg
SB-95-8	RC23E	1,1,1-Trichloroethane	37	U	R	ug/kg
SB-95-8	RC23E	Carbon Tetrachloride	37	U	R	ug/kg
SB-95-8	RC23E	Vinyl Acetate	190	U	R	ug/kg
SB-95-8	RC23E	Bromodichloromethane	37	U	R	ug/kg
SB-95-8	RC23E	1,2-Dichloropropane	37	U	R	ug/kg
SB-95-8	RC23E	cis-1,3-Dichloropropene	37	U	R	ug/kg
SB-95-8	RC23E	Trichloroethene	37	U	R	ug/kg
SB-95-8	RC23E	Dibromochloromethane	37	U	R	ug/kg
SB-95-8	RC23E	1,1,2-Trichloroethane	37	U	R	ug/kg
SB-95-8	RC23E	Benzene	37	U	R	ug/kg
SB-95-8	RC23E	trans-1,3-Dichloropropene	37	U	R	ug/kg
SB-95-8	RC23E	2-Chloroethylvinylether	190	U	R	ug/kg
SB-95-8	RC23E	Bromoform	37	U	R	ug/kg
SB-95-8	RC23E	4-Methyl-2-Pentanone (MIBK)	190	U	R	ug/kg
SB-95-8	RC23E	2-Hexanone	190	U	R	ug/kg
SB-95-8	RC23E	Tetrachloroethene	37	U	R	ug/kg
SB-95-8	RC23E	1,1,2,2-Tetrachloroethane	37	U	R	ug/kg
SB-95-8	RC23E	Toluene	37	U	R	ug/kg
SB-95-8	RC23E	Chlorobenzene	37	U	R	ug/kg
SB-95-8	RC23E	Ethylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	Styrene	37	U	R	ug/kg
SB-95-8	RC23E	Trichlorofluoromethane	37	U	R	ug/kg
SB-95-8	RC23E	1,1,2-Trichloro-1,2,2-trifluoroethane	75	U	R	ug/kg
SB-95-8	RC23E	m, p-Xylene	37	U	R	ug/kg
SB-95-8	RC23E	o-Xylene	37	U	R	ug/kg
SB-95-8	RC23E	1,2-Dichlorobenzene	37	U	R	ug/kg
SB-95-8	RC23E	1,3-Dichlorobenzene	37	U	R	ug/kg
SB-95-8	RC23E	1,4-Dichlorobenzene	37	U	R	ug/kg
SB-95-8	RC23E	Acrolein	1900	U	R	ug/kg
SB-95-8	RC23E	Methyl Iodide	37	U	R	ug/kg
SB-95-8	RC23E	Bromoethane	75	U	R	ug/kg
SB-95-8	RC23E	Acrylonitrile	190	U	R	ug/kg
SB-95-8	RC23E	1,1-Dichloropropene	37	U	R	ug/kg
SB-95-8	RC23E	Dibromomethane	37	U	R	ug/kg
SB-95-8	RC23E	1,1,1,2-Tetrachloroethane	37	U	R	ug/kg
SB-95-8	RC23E	1,2-Dibromo-3-chloropropane	190	U	R	ug/kg
SB-95-8	RC23E	1,2,3-Trichloropropane	75	U	R	ug/kg
SB-95-8	RC23E	trans-1,4-Dichloro-2-butene	190	U	R	ug/kg
SB-95-8	RC23E	1,3,5-Trimethylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	1,2,4-Trimethylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	Hexachlorobutadiene	190	U	R	ug/kg
SB-95-8	RC23E	Ethylene Dibromide	37	U	R	ug/kg
SB-95-8	RC23E	Bromochloromethane	37	U	R	ug/kg
SB-95-8	RC23E	Dichlorodifluoromethane	37	U	R	ug/kg
SB-95-8	RC23E	2,2-Dichloropropane	37	U	R	ug/kg
SB-95-8	RC23E	1,3-Dichloropropane	37	U	R	ug/kg
SB-95-8	RC23E	Isopropylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	n-Propylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	Bromobenzene	37	U	R	ug/kg
SB-95-8	RC23E	2-Chlorotoluene	37	U	R	ug/kg
SB-95-8	RC23E	4-Chlorotoluene	37	U	R	ug/kg
SB-95-8	RC23E	tert-Butylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	sec-Butylbenzene	37	U	R	ug/kg
SB-95-8	RC23E	4-Isopropyltoluene	37	U	R	ug/kg
SB-95-8	RC23E	n-Butylbenzene	37	U	R	ug/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-95-8	RC23E	1,2,4-Trichlorobenzene	190	U	R	ug/kg
SB-95-8	RC23E	Naphthalene	190	U	R	ug/kg
SB-95-8	RC23E	1,2,3-Trichlorobenzene	190	U	R	ug/kg
SB-95-8	RC23E	Methyl tert-Butyl Ether	37	U	R	ug/kg
SB-95-11	RC23F	Diesel Range Organics	24		J	mg/kg
SB-95-11	RC23F	Lube Oil	13	U	UJ	mg/kg
SB-95-14	RC23G	Diesel Range Organics	290		J	mg/kg
SB-95-14	RC23G	Lube Oil	22		J	mg/kg
SB-95-14	RC23G	Chloromethane	46	U	R	ug/kg
SB-95-14	RC23G	Bromomethane	46	U	R	ug/kg
SB-95-14	RC23G	Vinyl Chloride	46	U	R	ug/kg
SB-95-14	RC23G	Chloroethane	46	U	R	ug/kg
SB-95-14	RC23G	Methylene Chloride	91	U	R	ug/kg
SB-95-14	RC23G	Acetone	230	U	R	ug/kg
SB-95-14	RC23G	Carbon Disulfide	46	U	R	ug/kg
SB-95-14	RC23G	1,1-Dichloroethene	46	U	R	ug/kg
SB-95-14	RC23G	1,1-Dichloroethane	46	U	R	ug/kg
SB-95-14	RC23G	trans-1,2-Dichloroethene	46	U	R	ug/kg
SB-95-14	RC23G	cis-1,2-Dichloroethene	46	U	R	ug/kg
SB-95-14	RC23G	Chloroform	46	U	R	ug/kg
SB-95-14	RC23G	1,2-Dichloroethane	46	U	R	ug/kg
SB-95-14	RC23G	2-Butanone	230	U	R	ug/kg
SB-95-14	RC23G	1,1,1-Trichloroethane	46	U	R	ug/kg
SB-95-14	RC23G	Carbon Tetrachloride	46	U	R	ug/kg
SB-95-14	RC23G	Vinyl Acetate	230	U	R	ug/kg
SB-95-14	RC23G	Bromodichloromethane	46	U	R	ug/kg
SB-95-14	RC23G	1,2-Dichloropropane	46	U	R	ug/kg
SB-95-14	RC23G	cis-1,3-Dichloropropene	46	U	R	ug/kg
SB-95-14	RC23G	Trichloroethene	46	U	R	ug/kg
SB-95-14	RC23G	Dibromochloromethane	46	U	R	ug/kg
SB-95-14	RC23G	1,1,2-Trichloroethane	46	U	R	ug/kg
SB-95-14	RC23G	Benzene	46	U	R	ug/kg
SB-95-14	RC23G	trans-1,3-Dichloropropene	46	U	R	ug/kg
SB-95-14	RC23G	2-Chloroethylvinylether	230	U	R	ug/kg
SB-95-14	RC23G	Bromoform	46	U	R	ug/kg
SB-95-14	RC23G	4-Methyl-2-Pentanone (MIBK)	230	U	R	ug/kg
SB-95-14	RC23G	2-Hexanone	230	U	R	ug/kg
SB-95-14	RC23G	Tetrachloroethene	46	U	R	ug/kg
SB-95-14	RC23G	1,1,2,2-Tetrachloroethane	46	U	R	ug/kg
SB-95-14	RC23G	Toluene	46	U	R	ug/kg
SB-95-14	RC23G	Chlorobenzene	46	U	R	ug/kg
SB-95-14	RC23G	Ethylbenzene	46	U	R	ug/kg
SB-95-14	RC23G	Styrene	46	U	R	ug/kg
SB-95-14	RC23G	Trichlorofluoromethane	46	U	R	ug/kg
SB-95-14	RC23G	1,1,2-Trichloro-1,2,2-trifluoroethane	91	U	R	ug/kg
SB-95-14	RC23G	m, p-Xylene	46	U	R	ug/kg
SB-95-14	RC23G	o-Xylene	46	U	R	ug/kg
SB-95-14	RC23G	1,2-Dichlorobenzene	46	U	R	ug/kg
SB-95-14	RC23G	1,3-Dichlorobenzene	46	U	R	ug/kg
SB-95-14	RC23G	1,4-Dichlorobenzene	46	U	R	ug/kg
SB-95-14	RC23G	Acrolein	2300	U	R	ug/kg
SB-95-14	RC23G	Methyl Iodide	46	U	R	ug/kg
SB-95-14	RC23G	Bromoethane	91	U	R	ug/kg
SB-95-14	RC23G	Acrylonitrile	230	U	R	ug/kg
SB-95-14	RC23G	1,1-Dichloropropene	46	U	R	ug/kg
SB-95-14	RC23G	Dibromomethane	46	U	R	ug/kg
SB-95-14	RC23G	1,1,1,2-Tetrachloroethane	46	U	R	ug/kg
SB-95-14	RC23G	1,2-Dibromo-3-chloropropane	230	U	R	ug/kg
SB-95-14	RC23G	1,2,3-Trichloropropane	91	U	R	ug/kg
SB-95-14	RC23G	trans-1,4-Dichloro-2-butene	230	U	R	ug/kg
SB-95-14	RC23G	1,3,5-Trimethylbenzene	46	U	R	ug/kg

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-95-14	RC23G	1,2,4-Trimethylbenzene	46	U	R	ug/kg
SB-95-14	RC23G	Hexachlorobutadiene	230	U	R	ug/kg
SB-95-14	RC23G	Ethylene Dibromide	46	U	R	ug/kg
SB-95-14	RC23G	Bromochloromethane	46	U	R	ug/kg
SB-95-14	RC23G	Dichlorodifluoromethane	46	U	R	ug/kg
SB-95-14	RC23G	2,2-Dichloropropane	46	U	R	ug/kg
SB-95-14	RC23G	1,3-Dichloropropane	46	U	R	ug/kg
SB-95-14	RC23G	Isopropylbenzene	58		J	ug/kg
SB-95-14	RC23G	n-Propylbenzene	100		J	ug/kg
SB-95-14	RC23G	Bromobenzene	46	U	R	ug/kg
SB-95-14	RC23G	2-Chlorotoluene	46	U	R	ug/kg
SB-95-14	RC23G	4-Chlorotoluene	46	U	R	ug/kg
SB-95-14	RC23G	tert-Butylbenzene	46	U	R	ug/kg
SB-95-14	RC23G	sec-Butylbenzene	78		J	ug/kg
SB-95-14	RC23G	4-Isopropyltoluene	46	U	R	ug/kg
SB-95-14	RC23G	n-Butylbenzene	87		J	ug/kg
SB-95-14	RC23G	1,2,4-Trichlorobenzene	230	U	R	ug/kg
SB-95-14	RC23G	Naphthalene	230	U	R	ug/kg
SB-95-14	RC23G	1,2,3-Trichlorobenzene	230	U	R	ug/kg
SB-95-14	RC23G	Methyl tert-Butyl Ether	46	U	R	ug/kg
SB-93-10-DUP	RC23H	Diesel Range Organics	28		J	mg/kg
SB-93-10-DUP	RC23H	Lube Oil	13	U	UJ	mg/kg
SB-93-14	RC23I	Diesel Range Organics	52		J	mg/kg
SB-93-14	RC23I	Lube Oil	13	U	UJ	mg/kg
SB-94-5	RC23J	Diesel Range Organics	53		J	mg/kg
SB-94-5	RC23J	Lube Oil	380		J	mg/kg
SB-96-8	RC23K	Diesel Range Organics	3200	E	DNR	mg/kg
SB-96-8	RC23K	Lube Oil	260		J	mg/kg
SB-96-8	RC23KRE	Diesel Range Organics	3300		J	mg/kg
SB-96-8	RC23KRE	Lube Oil	640	U	DNR	mg/kg
SB-96-11	RC23L	Diesel Range Organics	2400	E	DNR	mg/kg
SB-96-11	RC23L	Lube Oil	140		J	mg/kg
SB-96-11	RC23LRE	Diesel Range Organics	2100		J	mg/kg
SB-96-11	RC23LRE	Lube Oil	250	U	DNR	mg/kg
SB-96-14	RC23M	Diesel Range Organics	1200	E	DNR	mg/kg
SB-96-14	RC23M	Lube Oil	50		J	mg/kg
SB-96-14	RC23MRE	Diesel Range Organics	1200		J	mg/kg
SB-96-14	RC23MRE	Lube Oil	130	U	DNR	mg/kg
SB-97-7	RC23N	Diesel Range Organics	5.6	U	UJ	mg/kg
SB-97-7	RC23N	Lube Oil	11	U	UJ	mg/kg
SB-93-GW	RC23O	Diesel Range Organics	0.37		J	mg/l
SB-93-GW	RC23O	Lube Oil	0.2	U	UJ	mg/l
SB-93-GW	RC23O	Chloromethane	0.5	U	R	ug/l
SB-93-GW	RC23O	Bromomethane	1	U	R	ug/l
SB-93-GW	RC23O	Vinyl Chloride	0.2	U	R	ug/l
SB-93-GW	RC23O	Chloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Methylene Chloride	0.5	U	R	ug/l
SB-93-GW	RC23O	Acetone	5	U	R	ug/l
SB-93-GW	RC23O	Carbon Disulfide	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1-Dichloroethene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1-Dichloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	trans-1,2-Dichloroethene	0.2	U	R	ug/l
SB-93-GW	RC23O	cis-1,2-Dichloroethene	0.2	U	R	ug/l
SB-93-GW	RC23O	Chloroform	0.2	U	R	ug/l
SB-93-GW	RC23O	1,2-Dichloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	2-Butanone	5	U	R	ug/l
SB-93-GW	RC23O	1,1,1-Trichloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Carbon Tetrachloride	0.2	U	R	ug/l
SB-93-GW	RC23O	Vinyl Acetate	1	U	R	ug/l
SB-93-GW	RC23O	Bromodichloromethane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,2-Dichloropropane	0.2	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-93-GW	RC23O	cis-1,3-Dichloropropene	0.2	U	R	ug/l
SB-93-GW	RC23O	Trichloroethene	0.2	U	R	ug/l
SB-93-GW	RC23O	Dibromochloromethane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1,2-Trichloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Benzene	0.2	U	R	ug/l
SB-93-GW	RC23O	trans-1,3-Dichloropropene	0.2	U	R	ug/l
SB-93-GW	RC23O	2-Chloroethylvinylether	1	U	R	ug/l
SB-93-GW	RC23O	Bromoform	0.2	U	R	ug/l
SB-93-GW	RC23O	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
SB-93-GW	RC23O	2-Hexanone	5	U	R	ug/l
SB-93-GW	RC23O	Tetrachloroethene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Toluene	0.3		J	ug/l
SB-93-GW	RC23O	Chlorobenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	Ethylbenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	Styrene	0.2	U	R	ug/l
SB-93-GW	RC23O	Trichlorofluoromethane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	m, p-Xylene	0.4		J	ug/l
SB-93-GW	RC23O	o-Xylene	0.3		J	ug/l
SB-93-GW	RC23O	1,2-Dichlorobenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,3-Dichlorobenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,4-Dichlorobenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	Acrolein	5	U	R	ug/l
SB-93-GW	RC23O	Methyl Iodide	1	U	R	ug/l
SB-93-GW	RC23O	Bromoethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Acrylonitrile	1	U	R	ug/l
SB-93-GW	RC23O	1,1-Dichloropropene	0.2	U	R	ug/l
SB-93-GW	RC23O	Dibromomethane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
SB-93-GW	RC23O	1,2,3-Trichloropropane	0.5	U	R	ug/l
SB-93-GW	RC23O	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
SB-93-GW	RC23O	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,2,4-Trimethylbenzene	0.4		J	ug/l
SB-93-GW	RC23O	Hexachlorobutadiene	0.5	U	R	ug/l
SB-93-GW	RC23O	Ethylene Dibromide	0.2	U	R	ug/l
SB-93-GW	RC23O	Bromochloromethane	0.2	U	R	ug/l
SB-93-GW	RC23O	Dichlorodifluoromethane	0.2	U	R	ug/l
SB-93-GW	RC23O	2,2-Dichloropropane	0.2	U	R	ug/l
SB-93-GW	RC23O	1,3-Dichloropropane	0.2	U	R	ug/l
SB-93-GW	RC23O	Isopropylbenzene	0.2		J	ug/l
SB-93-GW	RC23O	n-Propylbenzene	0.2		J	ug/l
SB-93-GW	RC23O	Bromobenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	2-Chlorotoluene	0.2	U	R	ug/l
SB-93-GW	RC23O	4-Chlorotoluene	0.2	U	R	ug/l
SB-93-GW	RC23O	tert-Butylbenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	sec-Butylbenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	4-Isopropyltoluene	0.2	U	R	ug/l
SB-93-GW	RC23O	n-Butylbenzene	0.2	U	R	ug/l
SB-93-GW	RC23O	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
SB-93-GW	RC23O	Naphthalene	0.5	U	R	ug/l
SB-93-GW	RC23O	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
SB-93-GW	RC23O	Methyl tert-Butyl Ether	0.5	U	R	ug/l
SB-94-GW	RC23P	Diesel Range Organics	6		J	mg/l
SB-94-GW	RC23P	Lube Oil	1	U	UJ	mg/l
SB-94-GW	RC23P	Chloromethane	0.5	U	R	ug/l
SB-94-GW	RC23P	Bromomethane	1	U	R	ug/l
SB-94-GW	RC23P	Vinyl Chloride	0.2	U	R	ug/l
SB-94-GW	RC23P	Chloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Methylene Chloride	0.5	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-94-GW	RC23P	Acetone	5	U	R	ug/l
SB-94-GW	RC23P	Carbon Disulfide	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1-Dichloroethene	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1-Dichloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	trans-1,2-Dichloroethene	0.2	U	R	ug/l
SB-94-GW	RC23P	cis-1,2-Dichloroethene	0.2	U	R	ug/l
SB-94-GW	RC23P	Chloroform	0.2	U	R	ug/l
SB-94-GW	RC23P	1,2-Dichloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	2-Butanone	5	U	R	ug/l
SB-94-GW	RC23P	1,1,1-Trichloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Carbon Tetrachloride	0.2	U	R	ug/l
SB-94-GW	RC23P	Vinyl Acetate	1	U	R	ug/l
SB-94-GW	RC23P	Bromodichloromethane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,2-Dichloropropane	0.2	U	R	ug/l
SB-94-GW	RC23P	cis-1,3-Dichloropropene	0.2	U	R	ug/l
SB-94-GW	RC23P	Trichloroethene	0.2	U	R	ug/l
SB-94-GW	RC23P	Dibromochloromethane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1,2-Trichloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Benzene	0.2	U	R	ug/l
SB-94-GW	RC23P	trans-1,3-Dichloropropene	0.2	U	R	ug/l
SB-94-GW	RC23P	2-Chloroethylvinylether	1	U	R	ug/l
SB-94-GW	RC23P	Bromoform	0.2	U	R	ug/l
SB-94-GW	RC23P	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
SB-94-GW	RC23P	2-Hexanone	5	U	R	ug/l
SB-94-GW	RC23P	Tetrachloroethene	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Toluene	0.2	U	R	ug/l
SB-94-GW	RC23P	Chlorobenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	Ethylbenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	Styrene	0.2	U	R	ug/l
SB-94-GW	RC23P	Trichlorofluoromethane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	m, p-Xylene	0.4	U	R	ug/l
SB-94-GW	RC23P	o-Xylene	0.2		J	ug/l
SB-94-GW	RC23P	1,2-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	1,3-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	1,4-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	Acrolein	5	U	R	ug/l
SB-94-GW	RC23P	Methyl Iodide	1	U	R	ug/l
SB-94-GW	RC23P	Bromoethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Acrylonitrile	1	U	R	ug/l
SB-94-GW	RC23P	1,1-Dichloropropene	0.2	U	R	ug/l
SB-94-GW	RC23P	Dibromomethane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
SB-94-GW	RC23P	1,2,3-Trichloropropane	0.5	U	R	ug/l
SB-94-GW	RC23P	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
SB-94-GW	RC23P	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	1,2,4-Trimethylbenzene	0.3		J	ug/l
SB-94-GW	RC23P	Hexachlorobutadiene	0.5	U	R	ug/l
SB-94-GW	RC23P	Ethylene Dibromide	0.2	U	R	ug/l
SB-94-GW	RC23P	Bromochloromethane	0.2	U	R	ug/l
SB-94-GW	RC23P	Dichlorodifluoromethane	0.2	U	R	ug/l
SB-94-GW	RC23P	2,2-Dichloropropane	0.2	U	R	ug/l
SB-94-GW	RC23P	1,3-Dichloropropane	0.2	U	R	ug/l
SB-94-GW	RC23P	Isopropylbenzene	6.1		J	ug/l
SB-94-GW	RC23P	n-Propylbenzene	6.8		J	ug/l
SB-94-GW	RC23P	Bromobenzene	0.2	U	R	ug/l
SB-94-GW	RC23P	2-Chlorotoluene	0.2	U	R	ug/l
SB-94-GW	RC23P	4-Chlorotoluene	0.2	U	R	ug/l
SB-94-GW	RC23P	tert-Butylbenzene	0.2		J	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-94-GW	RC23P	sec-Butylbenzene	2		J	ug/l
SB-94-GW	RC23P	4-Isopropyltoluene	0.2	U	R	ug/l
SB-94-GW	RC23P	n-Butylbenzene	0.8		J	ug/l
SB-94-GW	RC23P	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
SB-94-GW	RC23P	Naphthalene	0.5	U	R	ug/l
SB-94-GW	RC23P	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
SB-94-GW	RC23P	Methyl tert-Butyl Ether	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Diesel Range Organics	2.7		J	mg/l
SB-94-GW-DUP	RC23Q	Lube Oil	0.2	U	UJ	mg/l
SB-94-GW-DUP	RC23Q	Chloromethane	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Bromomethane	1	U	R	ug/l
SB-94-GW-DUP	RC23Q	Vinyl Chloride	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Chloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Methylene Chloride	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Acetone	5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Carbon Disulfide	0.2		J	ug/l
SB-94-GW-DUP	RC23Q	1,1-Dichloroethene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1-Dichloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	trans-1,2-Dichloroethene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	cis-1,2-Dichloroethene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Chloroform	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2-Dichloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	2-Butanone	5	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1,1-Trichloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Carbon Tetrachloride	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Vinyl Acetate	1	U	R	ug/l
SB-94-GW-DUP	RC23Q	Bromodichloromethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2-Dichloropropane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	cis-1,3-Dichloropropene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Trichloroethene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Dibromochloromethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1,2-Trichloroethane	0.2	Y	R	ug/l
SB-94-GW-DUP	RC23Q	Benzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	trans-1,3-Dichloropropene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	2-Chloroethylvinylether	1	U	R	ug/l
SB-94-GW-DUP	RC23Q	Bromoform	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
SB-94-GW-DUP	RC23Q	2-Hexanone	5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Tetrachloroethene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Toluene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Chlorobenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Ethylbenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Styrene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Trichlorofluoromethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	m, p-Xylene	0.4	U	R	ug/l
SB-94-GW-DUP	RC23Q	o-Xylene	0.3		J	ug/l
SB-94-GW-DUP	RC23Q	1,2-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,3-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,4-Dichlorobenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Acrolein	5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Methyl Iodide	1	U	R	ug/l
SB-94-GW-DUP	RC23Q	Bromoethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Acrylonitrile	1	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1-Dichloropropene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Dibromomethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2,3-Trichloropropane	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	trans-1,4-Dichloro-2-butene	1	U	R	ug/l

Table 2
Summary of Qualified Data
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Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-94-GW-DUP	RC23Q	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2,4-Trimethylbenzene	0.3		J	ug/l
SB-94-GW-DUP	RC23Q	Hexachlorobutadiene	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Ethylene Dibromide	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Bromochloromethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Dichlorodifluoromethane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	2,2-Dichloropropane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,3-Dichloropropane	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	Isopropylbenzene	5.4		J	ug/l
SB-94-GW-DUP	RC23Q	n-Propylbenzene	6.1		J	ug/l
SB-94-GW-DUP	RC23Q	Bromobenzene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	2-Chlorotoluene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	4-Chlorotoluene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	tert-Butylbenzene	0.2		J	ug/l
SB-94-GW-DUP	RC23Q	sec-Butylbenzene	2		J	ug/l
SB-94-GW-DUP	RC23Q	4-Isopropyltoluene	0.2	U	R	ug/l
SB-94-GW-DUP	RC23Q	n-Butylbenzene	0.8		J	ug/l
SB-94-GW-DUP	RC23Q	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Naphthalene	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
SB-94-GW-DUP	RC23Q	Methyl tert-Butyl Ether	0.5	U	R	ug/l
SB-95-GW	RC23R	Diesel Range Organics	0.17		J	mg/l
SB-95-GW	RC23R	Lube Oil	0.2	U	UJ	mg/l
SB-95-GW	RC23R	Chloromethane	0.5	U	R	ug/l
SB-95-GW	RC23R	Bromomethane	1	U	R	ug/l
SB-95-GW	RC23R	Vinyl Chloride	0.2	U	R	ug/l
SB-95-GW	RC23R	Chloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Methylene Chloride	0.5	U	R	ug/l
SB-95-GW	RC23R	Acetone	5	U	R	ug/l
SB-95-GW	RC23R	Carbon Disulfide	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1-Dichloroethene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1-Dichloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	trans-1,2-Dichloroethene	0.2	U	R	ug/l
SB-95-GW	RC23R	cis-1,2-Dichloroethene	0.2	U	R	ug/l
SB-95-GW	RC23R	Chloroform	0.2	U	R	ug/l
SB-95-GW	RC23R	1,2-Dichloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	2-Butanone	5	U	R	ug/l
SB-95-GW	RC23R	1,1,1-Trichloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Carbon Tetrachloride	0.2	U	R	ug/l
SB-95-GW	RC23R	Vinyl Acetate	1	U	R	ug/l
SB-95-GW	RC23R	Bromodichloromethane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,2-Dichloropropane	0.2	U	R	ug/l
SB-95-GW	RC23R	cis-1,3-Dichloropropene	0.2	U	R	ug/l
SB-95-GW	RC23R	Trichloroethene	0.2	U	R	ug/l
SB-95-GW	RC23R	Dibromochloromethane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1,2-Trichloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Benzene	0.2	U	R	ug/l
SB-95-GW	RC23R	trans-1,3-Dichloropropene	0.2	U	R	ug/l
SB-95-GW	RC23R	2-Chloroethylvinylether	1	U	R	ug/l
SB-95-GW	RC23R	Bromoform	0.2	U	R	ug/l
SB-95-GW	RC23R	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
SB-95-GW	RC23R	2-Hexanone	5	U	R	ug/l
SB-95-GW	RC23R	Tetrachloroethene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Toluene	0.2	U	R	ug/l
SB-95-GW	RC23R	Chlorobenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	Ethylbenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	Styrene	0.2	U	R	ug/l
SB-95-GW	RC23R	Trichlorofluoromethane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	m, p-Xylene	0.4	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
SB-95-GW	RC23R	o-Xylene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,2-Dichlorobenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,3-Dichlorobenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,4-Dichlorobenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	Acrolein	5	U	R	ug/l
SB-95-GW	RC23R	Methyl Iodide	1	U	R	ug/l
SB-95-GW	RC23R	Bromoethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Acrylonitrile	1	U	R	ug/l
SB-95-GW	RC23R	1,1-Dichloropropene	0.2	U	R	ug/l
SB-95-GW	RC23R	Dibromomethane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
SB-95-GW	RC23R	1,2,3-Trichloropropane	0.5	U	R	ug/l
SB-95-GW	RC23R	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
SB-95-GW	RC23R	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	1,2,4-Trimethylbenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	Hexachlorobutadiene	0.5	U	R	ug/l
SB-95-GW	RC23R	Ethylene Dibromide	0.2	U	R	ug/l
SB-95-GW	RC23R	Bromochloromethane	0.2	U	R	ug/l
SB-95-GW	RC23R	Dichlorodifluoromethane	0.2	U	R	ug/l
SB-95-GW	RC23R	2,2-Dichloropropane	0.2	U	R	ug/l
SB-95-GW	RC23R	1,3-Dichloropropane	0.2	U	R	ug/l
SB-95-GW	RC23R	Isopropylbenzene	1.1		J	ug/l
SB-95-GW	RC23R	n-Propylbenzene	1.2		J	ug/l
SB-95-GW	RC23R	Bromobenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	2-Chlorotoluene	0.2	U	R	ug/l
SB-95-GW	RC23R	4-Chlorotoluene	0.2	U	R	ug/l
SB-95-GW	RC23R	tert-Butylbenzene	0.2	U	R	ug/l
SB-95-GW	RC23R	sec-Butylbenzene	0.8		J	ug/l
SB-95-GW	RC23R	4-Isopropyltoluene	0.2	U	R	ug/l
SB-95-GW	RC23R	n-Butylbenzene	0.6		J	ug/l
SB-95-GW	RC23R	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
SB-95-GW	RC23R	Naphthalene	0.5	U	R	ug/l
SB-95-GW	RC23R	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
SB-95-GW	RC23R	Methyl tert-Butyl Ether	0.5	U	R	ug/l
SB-105-6	RC24A	Diesel Range Organics	5.5	U	UJ	mg/kg
SB-105-6	RC24A	Lube Oil	11	U	UJ	mg/kg
SB-105-11	RC24B	Diesel Range Organics	8	U	UJ	mg/kg
SB-105-11	RC24B	Lube Oil	16	U	UJ	mg/kg
SB-106-5	RC24C	Diesel Range Organics	6.8	U	UJ	mg/kg
SB-106-5	RC24C	Lube Oil	14	U	UJ	mg/kg
SB-106-10	RC24D	Diesel Range Organics	7.2	U	UJ	mg/kg
SB-106-10	RC24D	Lube Oil	22		J	mg/kg
SB-106-14	RC24E	Diesel Range Organics	6.7	U	UJ	mg/kg
SB-106-14	RC24E	Lube Oil	13	U	UJ	mg/kg
SB-107-5	RC24F	Diesel Range Organics	5.8	U	UJ	mg/kg
SB-107-5	RC24F	Lube Oil	12	U	UJ	mg/kg
SB-107-10	RC24G	Diesel Range Organics	7.1	U	UJ	mg/kg
SB-107-10	RC24G	Lube Oil	14	U	UJ	mg/kg
SB-107-13	RC24H	Diesel Range Organics	6.6	U	UJ	mg/kg
SB-107-13	RC24H	Lube Oil	17		J	mg/kg
EQB-1	RC24I	Diesel Range Organics	0.1	U	UJ	mg/l
EQB-1	RC24I	Lube Oil	0.2	U	UJ	mg/l
EQB-1	RC24I	Chloromethane	0.5	U	R	ug/l
EQB-1	RC24I	Bromomethane	1	U	R	ug/l
EQB-1	RC24I	Vinyl Chloride	0.2	U	R	ug/l
EQB-1	RC24I	Chloroethane	0.2	U	R	ug/l
EQB-1	RC24I	Methylene Chloride	0.5		J	ug/l
EQB-1	RC24I	Acetone	5	U	R	ug/l
EQB-1	RC24I	Carbon Disulfide	0.2	U	R	ug/l
EQB-1	RC24I	1,1-Dichloroethene	0.2	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
EQB-1	RC24I	1,1-Dichloroethane	0.2	U	R	ug/l
EQB-1	RC24I	trans-1,2-Dichloroethene	0.2	U	R	ug/l
EQB-1	RC24I	cis-1,2-Dichloroethene	0.2	U	R	ug/l
EQB-1	RC24I	Chloroform	0.2	U	R	ug/l
EQB-1	RC24I	1,2-Dichloroethane	0.2	U	R	ug/l
EQB-1	RC24I	2-Butanone	5	U	R	ug/l
EQB-1	RC24I	1,1,1-Trichloroethane	0.2	U	R	ug/l
EQB-1	RC24I	Carbon Tetrachloride	0.2	U	R	ug/l
EQB-1	RC24I	Vinyl Acetate	1	U	R	ug/l
EQB-1	RC24I	Bromodichloromethane	0.2	U	R	ug/l
EQB-1	RC24I	1,2-Dichloropropane	0.2	U	R	ug/l
EQB-1	RC24I	cis-1,3-Dichloropropene	0.2	U	R	ug/l
EQB-1	RC24I	Trichloroethene	0.2	U	R	ug/l
EQB-1	RC24I	Dibromochloromethane	0.2	U	R	ug/l
EQB-1	RC24I	1,1,2-Trichloroethane	0.2	U	R	ug/l
EQB-1	RC24I	Benzene	0.2	U	R	ug/l
EQB-1	RC24I	trans-1,3-Dichloropropene	0.2	U	R	ug/l
EQB-1	RC24I	2-Chloroethylvinylether	1	U	R	ug/l
EQB-1	RC24I	Bromoform	0.2	U	R	ug/l
EQB-1	RC24I	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
EQB-1	RC24I	2-Hexanone	5	U	R	ug/l
EQB-1	RC24I	Tetrachloroethene	0.2	U	R	ug/l
EQB-1	RC24I	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
EQB-1	RC24I	Toluene	0.2	U	R	ug/l
EQB-1	RC24I	Chlorobenzene	0.2	U	R	ug/l
EQB-1	RC24I	Ethylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	Styrene	0.2	U	R	ug/l
EQB-1	RC24I	Trichlorofluoromethane	0.2	U	R	ug/l
EQB-1	RC24I	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
EQB-1	RC24I	m, p-Xylene	0.4	U	R	ug/l
EQB-1	RC24I	o-Xylene	0.2	U	R	ug/l
EQB-1	RC24I	1,2-Dichlorobenzene	0.2	U	R	ug/l
EQB-1	RC24I	1,3-Dichlorobenzene	0.2	U	R	ug/l
EQB-1	RC24I	1,4-Dichlorobenzene	0.2	U	R	ug/l
EQB-1	RC24I	Acrolein	5	U	R	ug/l
EQB-1	RC24I	Methyl Iodide	1	U	R	ug/l
EQB-1	RC24I	Bromoethane	0.2	U	R	ug/l
EQB-1	RC24I	Acrylonitrile	1	U	R	ug/l
EQB-1	RC24I	1,1-Dichloropropene	0.2	U	R	ug/l
EQB-1	RC24I	Dibromomethane	0.2	U	R	ug/l
EQB-1	RC24I	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
EQB-1	RC24I	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
EQB-1	RC24I	1,2,3-Trichloropropane	0.5	U	R	ug/l
EQB-1	RC24I	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
EQB-1	RC24I	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	1,2,4-Trimethylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	Hexachlorobutadiene	0.5	U	R	ug/l
EQB-1	RC24I	Ethylene Dibromide	0.2	U	R	ug/l
EQB-1	RC24I	Bromochloromethane	0.2	U	R	ug/l
EQB-1	RC24I	Dichlorodifluoromethane	0.2	U	R	ug/l
EQB-1	RC24I	2,2-Dichloropropane	0.2	U	R	ug/l
EQB-1	RC24I	1,3-Dichloropropane	0.2	U	R	ug/l
EQB-1	RC24I	Isopropylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	n-Propylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	Bromobenzene	0.2	U	R	ug/l
EQB-1	RC24I	2-Chlorotoluene	0.2	U	R	ug/l
EQB-1	RC24I	4-Chlorotoluene	0.2	U	R	ug/l
EQB-1	RC24I	tert-Butylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	sec-Butylbenzene	0.2	U	R	ug/l
EQB-1	RC24I	4-Isopropyltoluene	0.2	U	R	ug/l
EQB-1	RC24I	n-Butylbenzene	0.2	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
EQB-1	RC24I	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
EQB-1	RC24I	Naphthalene	0.5	U	R	ug/l
EQB-1	RC24I	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
EQB-1	RC24I	Methyl tert-Butyl Ether	0.5	U	R	ug/l
EQB-2	RC24J	Diesel Range Organics	0.1	U	UJ	mg/l
EQB-2	RC24J	Lube Oil	0.2	U	UJ	mg/l
EQB-2	RC24J	Chloromethane	0.5	U	R	ug/l
EQB-2	RC24J	Bromomethane	1	U	R	ug/l
EQB-2	RC24J	Vinyl Chloride	0.2	U	R	ug/l
EQB-2	RC24J	Chloroethane	0.2	U	R	ug/l
EQB-2	RC24J	Methylene Chloride	0.6		J	ug/l
EQB-2	RC24J	Acetone	5	U	R	ug/l
EQB-2	RC24J	Carbon Disulfide	0.2	U	R	ug/l
EQB-2	RC24J	1,1-Dichloroethene	0.2	U	R	ug/l
EQB-2	RC24J	1,1-Dichloroethane	0.2	U	R	ug/l
EQB-2	RC24J	trans-1,2-Dichloroethene	0.2	U	R	ug/l
EQB-2	RC24J	cis-1,2-Dichloroethene	0.2	U	R	ug/l
EQB-2	RC24J	Chloroform	0.2	U	R	ug/l
EQB-2	RC24J	1,2-Dichloroethane	0.2	U	R	ug/l
EQB-2	RC24J	2-Butanone	5	U	R	ug/l
EQB-2	RC24J	1,1,1-Trichloroethane	0.2	U	R	ug/l
EQB-2	RC24J	Carbon Tetrachloride	0.2	U	R	ug/l
EQB-2	RC24J	Vinyl Acetate	1	U	R	ug/l
EQB-2	RC24J	Bromodichloromethane	0.2	U	R	ug/l
EQB-2	RC24J	1,2-Dichloropropane	0.2	U	R	ug/l
EQB-2	RC24J	cis-1,3-Dichloropropene	0.2	U	R	ug/l
EQB-2	RC24J	Trichloroethene	0.2	U	R	ug/l
EQB-2	RC24J	Dibromochloromethane	0.2	U	R	ug/l
EQB-2	RC24J	1,1,2-Trichloroethane	0.2	U	R	ug/l
EQB-2	RC24J	Benzene	0.2	U	R	ug/l
EQB-2	RC24J	trans-1,3-Dichloropropene	0.2	U	R	ug/l
EQB-2	RC24J	2-Chloroethylvinylether	1	U	R	ug/l
EQB-2	RC24J	Bromoform	0.2	U	R	ug/l
EQB-2	RC24J	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
EQB-2	RC24J	2-Hexanone	5	U	R	ug/l
EQB-2	RC24J	Tetrachloroethene	0.2	U	R	ug/l
EQB-2	RC24J	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
EQB-2	RC24J	Toluene	0.2	U	R	ug/l
EQB-2	RC24J	Chlorobenzene	0.2	U	R	ug/l
EQB-2	RC24J	Ethylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	Styrene	0.2	U	R	ug/l
EQB-2	RC24J	Trichlorofluoromethane	0.2	U	R	ug/l
EQB-2	RC24J	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
EQB-2	RC24J	m, p-Xylene	0.4	U	R	ug/l
EQB-2	RC24J	o-Xylene	0.2	U	R	ug/l
EQB-2	RC24J	1,2-Dichlorobenzene	0.2	U	R	ug/l
EQB-2	RC24J	1,3-Dichlorobenzene	0.2	U	R	ug/l
EQB-2	RC24J	1,4-Dichlorobenzene	0.2	U	R	ug/l
EQB-2	RC24J	Acrolein	5	U	R	ug/l
EQB-2	RC24J	Methyl Iodide	1	U	R	ug/l
EQB-2	RC24J	Bromoethane	0.2	U	R	ug/l
EQB-2	RC24J	Acrylonitrile	1	U	R	ug/l
EQB-2	RC24J	1,1-Dichloropropene	0.2	U	R	ug/l
EQB-2	RC24J	Dibromomethane	0.2	U	R	ug/l
EQB-2	RC24J	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
EQB-2	RC24J	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
EQB-2	RC24J	1,2,3-Trichloropropane	0.5	U	R	ug/l
EQB-2	RC24J	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
EQB-2	RC24J	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	1,2,4-Trimethylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	Hexachlorobutadiene	0.5	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
EQB-2	RC24J	Ethylene Dibromide	0.2	U	R	ug/l
EQB-2	RC24J	Bromochloromethane	0.2	U	R	ug/l
EQB-2	RC24J	Dichlorodifluoromethane	0.2	U	R	ug/l
EQB-2	RC24J	2,2-Dichloropropane	0.2	U	R	ug/l
EQB-2	RC24J	1,3-Dichloropropane	0.2	U	R	ug/l
EQB-2	RC24J	Isopropylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	n-Propylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	Bromobenzene	0.2	U	R	ug/l
EQB-2	RC24J	2-Chlorotoluene	0.2	U	R	ug/l
EQB-2	RC24J	4-Chlorotoluene	0.2	U	R	ug/l
EQB-2	RC24J	tert-Butylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	sec-Butylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	4-Isopropyltoluene	0.2	U	R	ug/l
EQB-2	RC24J	n-Butylbenzene	0.2	U	R	ug/l
EQB-2	RC24J	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
EQB-2	RC24J	Naphthalene	0.5	U	R	ug/l
EQB-2	RC24J	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
EQB-2	RC24J	Methyl tert-Butyl Ether	0.5	U	R	ug/l
Trip Blank	RC24K	Chloromethane	0.5	U	R	ug/l
Trip Blank	RC24K	Bromomethane	1	U	R	ug/l
Trip Blank	RC24K	Vinyl Chloride	0.2	U	R	ug/l
Trip Blank	RC24K	Chloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	Methylene Chloride	0.5	U	R	ug/l
Trip Blank	RC24K	Acetone	5	U	R	ug/l
Trip Blank	RC24K	Carbon Disulfide	0.2	U	R	ug/l
Trip Blank	RC24K	1,1-Dichloroethene	0.2	U	R	ug/l
Trip Blank	RC24K	1,1-Dichloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	trans-1,2-Dichloroethene	0.2	U	R	ug/l
Trip Blank	RC24K	cis-1,2-Dichloroethene	0.2	U	R	ug/l
Trip Blank	RC24K	Chloroform	0.2	U	R	ug/l
Trip Blank	RC24K	1,2-Dichloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	2-Butanone	5	U	R	ug/l
Trip Blank	RC24K	1,1,1-Trichloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	Carbon Tetrachloride	0.2	U	R	ug/l
Trip Blank	RC24K	Vinyl Acetate	1	U	R	ug/l
Trip Blank	RC24K	Bromodichloromethane	0.2	U	R	ug/l
Trip Blank	RC24K	1,2-Dichloropropane	0.2	U	R	ug/l
Trip Blank	RC24K	cis-1,3-Dichloropropene	0.2	U	R	ug/l
Trip Blank	RC24K	Trichloroethene	0.2	U	R	ug/l
Trip Blank	RC24K	Dibromochloromethane	0.2	U	R	ug/l
Trip Blank	RC24K	1,1,2-Trichloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	Benzene	0.2	U	R	ug/l
Trip Blank	RC24K	trans-1,3-Dichloropropene	0.2	U	R	ug/l
Trip Blank	RC24K	2-Chloroethylvinylether	1	U	R	ug/l
Trip Blank	RC24K	Bromoform	0.2	U	R	ug/l
Trip Blank	RC24K	4-Methyl-2-Pentanone (MIBK)	5	U	R	ug/l
Trip Blank	RC24K	2-Hexanone	5	U	R	ug/l
Trip Blank	RC24K	Tetrachloroethene	0.2	U	R	ug/l
Trip Blank	RC24K	1,1,2,2-Tetrachloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	Toluene	0.2	U	R	ug/l
Trip Blank	RC24K	Chlorobenzene	0.2	U	R	ug/l
Trip Blank	RC24K	Ethylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	Styrene	0.2	U	R	ug/l
Trip Blank	RC24K	Trichlorofluoromethane	0.2	U	R	ug/l
Trip Blank	RC24K	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	U	R	ug/l
Trip Blank	RC24K	m, p-Xylene	0.4	U	R	ug/l
Trip Blank	RC24K	o-Xylene	0.2	U	R	ug/l
Trip Blank	RC24K	1,2-Dichlorobenzene	0.2	U	R	ug/l
Trip Blank	RC24K	1,3-Dichlorobenzene	0.2	U	R	ug/l
Trip Blank	RC24K	1,4-Dichlorobenzene	0.2	U	R	ug/l
Trip Blank	RC24K	Acrolein	5	U	R	ug/l

Table 2
Summary of Qualified Data
Everett Shipyard - Additional Soil Sampling June 2010

Sample ID	Laboratory ID	Analyte	Result	Laboratory Qualifier	Data Validation Qualifier	Units
Trip Blank	RC24K	Methyl Iodide	1	U	R	ug/l
Trip Blank	RC24K	Bromoethane	0.2	U	R	ug/l
Trip Blank	RC24K	Acrylonitrile	1	U	R	ug/l
Trip Blank	RC24K	1,1-Dichloropropene	0.2	U	R	ug/l
Trip Blank	RC24K	Dibromomethane	0.2	U	R	ug/l
Trip Blank	RC24K	1,1,1,2-Tetrachloroethane	0.2	U	R	ug/l
Trip Blank	RC24K	1,2-Dibromo-3-chloropropane	0.5	U	R	ug/l
Trip Blank	RC24K	1,2,3-Trichloropropane	0.5	U	R	ug/l
Trip Blank	RC24K	trans-1,4-Dichloro-2-butene	1	U	R	ug/l
Trip Blank	RC24K	1,3,5-Trimethylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	1,2,4-Trimethylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	Hexachlorobutadiene	0.5	U	R	ug/l
Trip Blank	RC24K	Ethylene Dibromide	0.2	U	R	ug/l
Trip Blank	RC24K	Bromochloromethane	0.2	U	R	ug/l
Trip Blank	RC24K	Dichlorodifluoromethane	0.2	U	R	ug/l
Trip Blank	RC24K	2,2-Dichloropropane	0.2	U	R	ug/l
Trip Blank	RC24K	1,3-Dichloropropane	0.2	U	R	ug/l
Trip Blank	RC24K	Isopropylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	n-Propylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	Bromobenzene	0.2	U	R	ug/l
Trip Blank	RC24K	2-Chlorotoluene	0.2	U	R	ug/l
Trip Blank	RC24K	4-Chlorotoluene	0.2	U	R	ug/l
Trip Blank	RC24K	tert-Butylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	sec-Butylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	4-Isopropyltoluene	0.2	U	R	ug/l
Trip Blank	RC24K	n-Butylbenzene	0.2	U	R	ug/l
Trip Blank	RC24K	1,2,4-Trichlorobenzene	0.5	U	R	ug/l
Trip Blank	RC24K	Naphthalene	0.5	U	R	ug/l
Trip Blank	RC24K	1,2,3-Trichlorobenzene	0.5	U	R	ug/l
Trip Blank	RC24K	Methyl tert-Butyl Ether	0.5	U	R	ug/l

APPENDIX B

SOIL BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring MW-4** Sheet 1 of 1

Date(s) Drilled	**12/9/08**	Logged By	**BTG**	Checked By	**DRR**
Drilling Method	**Hollow Stem Auger**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**13.3 feet bgs**
Drill Rig Type	**Truck Mounted**	Drill Bit Size/Type	**6"**	Ground Surface Elevation	**15.42 feet MSL**
Groundwater Level	**8.25**	Sampling Method	**Split Spoon**	Hammer Data	**STD**
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
	0							Asphalt	
15							GM	Brown/gray, silty, sandy GRAVEL (moist) (base course)	
			MW-4-0-0.5		90	0.0	SM	Brown, gravelly silty SAND with shell fragments (moist) (hydraulic fill) (no odor, no staining)	
	2								8:25
			MW-4-1-2	82	90	0.0	SP	Brown SAND with silt and fine gravel and shell fragments (moist) (dense) (hydraulic fill) (no odor, no staining)	
	4		MW-4-2-3	30		0.0			
								Grading light brown, fine to medium SAND with fine gravel and few shell fragments, sandy silt laminations (moist) (dense)	8:40
10									8:45
	6			17	90	0.0		Grading gray, medium SAND (moist) (medium dense)	
	8			7	90	0.0		Grading tan/light brown fine to medium SAND	
								8.25 ft ▼	
								Grading gray, wet at 8.55'	9:00
	10								
5									
				12	90	0.0		Grading increasing shell fragments	
	12								
	14							Boring was completed to 13.3' bgs. Groundwater was encountered at 8.25' bgs. Boring was completed as monitoring well: 3'-13' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-3' blank 2" diameter Sch 40 PVC Fill Annulus: 2'-13.3' 10/12 silica sand filter pack 1.5'-2' 3/8" bentonite chips - hydrated 0'-1.5' cement - part of flush mount surface completion	
0									
	16								

ENV2 WITH WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Log of Boring MW-5

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	**12/9/08**	Logged By	**BTG**	Checked By	**DRR**
Drilling Method	**Hollow Stem Auger**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**12.9 feet bgs**
Drill Rig Type	**Truck Mounted**	Drill Bit Size/Type	**6"**	Ground Surface Elevation	**15.13 feet MSL**
Groundwater Level	**8.5**	Sampling Method	**Split Spoon**	Hammer Data	**STD**
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES: Type / Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
15	0						Asphalt	
						GM	Brown, silty, sandy GRAVEL (moist) (base course)	
	2	MW-5-0-0.5				GP	Brown, gravelly SAND with silt and asphalt fragments (moist) (base course)	
		MW-5-1-2	69	90	0.0	SP	Tan/light brown, fine to medium SAND with several sandy silt lenses, slightly mottled, few shell fragments (moist) (hydraulic fill) (no odor, no staining)	10:15
	4	MW-5-2-3					Grading gray, fine to medium SAND with shell fragments (moist) (medium dense)	10:25
10			26	90	0.0			
	6		30	90	0.0		Grading 2" brown sand layer, no shells	10:30
	8						Grading light brown fine SAND with few shell fragments (wet) (medium dense) 8.5 ft	
			18	90	0.0	SM	Gray/dark gray, silty, very fine SAND (wet) (medium dense) (no odor, no sheen)	
5	10							
						SP	Gray fine SAND (wet)	
	12		14	90	0.0			
	14						Boring was completed to 12.9' bgs. Groundwater was encountered at 8.5' bgs. Boring was completed as monitoring well: 2.5'-12.5' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.5' blank 2" diameter Sch 40 PVC Fill Annulus: 2'-12.9' 10/12 silica sand filter pack 1.5'-2' 3/8" bentonite chips - hydrated 0'-1.5' cement - part of flush mount surface completion	
0								
	16							

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring MW-6

Date(s) Drilled	**12/9/08**	Logged By	**BTG**	Checked By	**DRR**
Drilling Method	**Hollow Stem Auger**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**12.5 feet bgs**
Drill Rig Type	**Truck Mounted**	Drill Bit Size/Type	**6"**	Ground Surface Elevation	**13.6 feet MSL**
Groundwater Level	**7.5**	Sampling Method	**Split Spoon**	Hammer Data	**STD**
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	Samples Type	Samples Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
	0								Asphalt		
			MW-6-0-0.5					SP	Light grayish brown fine SAND with gravel with some mottling at surface, some asphalt fragments (moist) (medium dense) (fill)		11:25
	2		MW-6-1-2	30	90	0.0			Grading gray/tan, very fine to fine SAND, asphalt coated coarse sand and fine gravel (base course) (no odor, no staining)		11:30
10			MW-6-2-3						Grading gray alternating fine to very fine SAND, trace organics (moist) (dense) (hydraulic fill)		11:35
	4			38	90	0.4			Grading yellowish/tan, fine to medium SAND mottled with gray (moist) (medium dense)		
	6			20	90	0.0					
				5	90	0.0			Grading gray, very fine SAND with silt and few shell fragments, 0.5"-1" organic layers at 7.5' and 10.5' bgs (wet) (loose) 7.5 ft.		
	8										
5											
	10										
	12			6	90	0.0					
0	14								Boring was completed to 12.5' bgs. Groundwater was encountered at 7.5'-8' bgs. Boring was completed as monitoring well: 2.5'-12.5' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.5' blank 2" diameter Sch 40 PVC Fill Annulus: 1.5'-12.5' 10/12 silica sand filter pack 1'-1.5' 3/8" bentonite chips - hydrated 0'-1' cement - part of flush mount surface completion		
	16										

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring MW-7** Sheet 1 of 1

Date(s) Drilled	**12/8/08**	Logged By	**BTG**	Checked By	**DRR**
Drilling Method	**Hollow Stem Auger**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**12.5 feet bgs**
Drill Rig Type	**Truck Mounted**	Drill Bit Size/Type	**6"**	Ground Surface Elevation	**15.27 feet MSL**
Groundwater Level	**3.5**	Sampling Method	**Split Spoon**	Hammer Data	**STD**
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	Samples: Type	Samples: Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
15	0		MW-7-0-0.5			0.0		SP	Black/brown SAND with silt and gravel, mottling at base (moist) (loose) (30% abrasive grit) (fill) Grading dark brown, silty, fine to medium SAND with trace gravel (mioist) (dense) (with abrasive grit) (no odor, no staining) Grading light brown/tan medium SAND (moist) (medium dense) (hydraulic fill)		14:28 14:30
	2		MW-7-1-2	10	90	0.0			Grading tan/light gray, very fine to medium SAND, slight mottling in very fine sand laminations (moist to wet)		14:35
			MW-7-2-3	6	90	0.0			3.5 ft Grading wet		15:00
	4		MW-7-3-4								
10				9	90	0.0		ML/SM	Gray, very fine sandy SILT to silty very fine SAND with trace organics (wet) (medium stiff)		
	6							SP	Gray/dark gray, fine to medium SAND (wet) (loose)		
	8			8	90	0.0					
5	10								Grading 1" organic rich layer in gray sand		
	12			6	90	0.0					
	14								Boring was completed to 12.5' bgs. Groundwater was encountered at 3.5' bgs. Boring was completed as monitoring well: 2.5'-12.5' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.5' blank 2" diameter Sch 40 PVC Fill Annulus: 2'-12.5' 10/12 silica sand filter pack 1.5'-2' 3/8" bentonite chips - hydrated 0'-1.5' cement - part of flush mount surface completion		
0	16										

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring MW-8

Sheet 1 of 1

Date(s) Drilled	**12/8/08**	Logged By	**BTG**	Checked By	**DRR**
Drilling Method	**Hollow Stem Auger**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**13 feet bgs**
Drill Rig Type	**Truck Mounted**	Drill Bit Size/Type	**6"**	Ground Surface Elevation	**15.24 feet MSL**
Groundwater Level	**5.0**	Sampling Method	**Split Spoon**	Hammer Data	**STD**
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type / Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
15	0						Asphalt	
						GM	Brown, silty, sandy GRAVEL (moist) (medium dense) (base course)	
		MW-8-0-0.5			0.0	SP	Light brown/tan very fine to fine SAND with trace gravel, shell fragments (moist) (medium dense) (hydraulic fill) (no odor, no sheen)	
	2				0.0			13:10
		MW-8-1-2	28	90	0.0			13:15
		MW-8-2-3					Grading tan/very dark brown, fine to medium SAND with mottling (moist) (medium dense)	
	4		13	90			Grading yellowish red/tan, very fine to fine SAND with silt, mottling and few silty lenses (moist) (medium dense)	13:20
10							5.0 ft ▼ Grading gray, very fine to fine SAND with silt (moist to wet)	
	6		11	90	0.0			
	8		14	90	0.0		Grading gray, very fine to fine SAND with trace silt, few shell fragments (wet) (medium dense)	
5	10							
	12		26	90	0.0		Grading 2"-4" thick organic layer	
	14						Boring was completed to 13' bgs. Groundwater was encountered at 5.0' bgs. Boring was completed as monitoring well: 2'-12.5' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.5' blank 2" diameter Sch 40 PVC Fill Annulus: 2'-13' 10/12 silica sand filter pack 1.5'-2' 3/8" bentonite chips - hydrated 0'-1.5' cement - part of flush mount surface completion	
0	16							

URS

Project: Everett Shipyard	Log of Boring MW-9
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/8/08	Logged By	BTG	Checked By	DRR
Drilling Method	Hollow Stem Auger	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	13.5 feet bgs
Drill Rig Type	Truck Mounted	Drill Bit Size/Type	6"	Ground Surface Elevation	15.99 feet MSL
Groundwater Level	6.0	Sampling Method	Split Spoon	Hammer Data	STD
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type / Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
	0						Asphalt	
15						GM	Gray, silty, sandy GRAVEL (moist) (medium dense) (base course)	
		MW-9-0-0.5			0.0	SP	Brown, fine to medium SAND with gravel and shell fragments (moist) (medium dense) (no odor, no sheen)	
	2				0.0		Grading light brown/light gray, fine to medium SAND (moist) (medium dense) (hydraulic fill)	8:35
		MW-9-1-2	40		0.0			8:50
	4	MW-9-2-3	22	90			Grading gray, medium SAND with shell fragments (moist) (medium dense)	9:00
							Grading light brown/tan medium SAND (moist) (medium dense)	
				90	0.0			
10	6	MW-9-4-5	11		0.0		6.0 ft. ▼	9:05
				90			Grading wet	
	8						Grading gray, to dark gray, fine to medium SAND with shell fragments (wet) (loose)	
			9		0.0		Grading gray, very fine to medium SAND with trace shell fragments (wet) (loose)	
	10			90				
5							Grading gray, fine to medium SAND with trace shell fragments (wet) (loose)	
	12		5	90	0.0	SM	Gray, silty SAND, trace shell fragments (wet) (loose) (no odor, no sheen)	
	14						Boring was completed to 13.5' bgs. Groundwater was encountered at 6.0' bgs. Boring was completed as monitoring well: 2.9'-12.9' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.9' blank 2" diameter Sch 40 PVC Fill Annulus: 2.5'-13.4' 10/12 silica sand filter pack 2'-2.5' 3/8" bentonite chips - hydrated 0'-2.5' cement - part of flush mount surface completion	
0	16							

Project: Everett Shipyard	Log of Boring MW-10
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/8/08	Logged By	BTG	Checked By	DRR
Drilling Method	Hollow Stem Auger	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	13.2 feet bgs
Drill Rig Type	Truck Mounted	Drill Bit Size/Type	6"	Ground Surface Elevation	15.61 feet MSL
Groundwater Level	5.5	Sampling Method	Split Spoon	Hammer Data	STD
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
	0							Asphalt	
15							GP	Dark grayish-brown, silty sandy GRAVEL (moist) (loose) (base course)	
							SP	Light grayish brown, fine to medium SAND (moist) (loose) (fill)	
	2							Asphalt	
							SP	Light gray/tan, fine to medium SAND with few shell fragments (moist) (dense) (hydraulic fill) (no odor, no sheen)	
				38	90	0.0			
	4							Grading light gray, very fine SAND with trace silt (moist) (loose to medium dense)	
							SM	Gray to dark gray, very fine sandy SILT (moist) (stiff)	
				11	90	0.0	SP	Tan/gray mottled, fine to medium SAND with trace silt (moist) (loose to medium dense)	5.5 ft
10	6							Grading gray, fine to medium SAND with laminated organic layer at 6.2' bgs (wet) (loose)	
				10	90	0.0			
	8						SM	Gray, silty, very fine to fine SAND with trace shell fragments and organics (wet) (loose)	
				5	90	0.0			
	10								
5								Grading decreasing silt	
	12			4	90	0.0		Grading no organics	
	14							Boring was completed to 13.2' bgs. Groundwater was encountered at 5.5' bgs. Boring was completed as monitoring well: 2.5'-12.5' screen, 2" diameter Sch 40 PVC with 0.020" slot 0'-2.5' blank 2" diameter Sch 40 PVC Fill Annulus: 2'-13.2' 10/12 silica sand filter pack 1.5'-2' 3/8" bentonite chips - hydrated 0'-1.5' cement - part of flush mount surface completion	
0	16								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-1

Date(s) Drilled	**12/11/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	9:38 start time
						SP	Gray-brown, coarse SAND (dry) (no odor, no staining) (base course)	
1		SB-1-0-0.5					Graging gray-brown, medium to coarse SAND with some rusty mottling (dry to moist) (soft) (no odor, no staining) (hydraulic fill)	9:55
2		SB-1-1-2	90	2.2				9:57
3		SB-1-2-3		0.6			Grading gray, fine to medium SAND with woody debris (moist to wet) (loose) (no odor, no staining) (hydraulic fill)	9:59
				5.9				
4 (4.0 ft ▼)				0.5				
5		SB-1-4-5		0.4				10:01
6			90					
7				0.0			Grading gray, medium to coarse SAND with shell fragments (wet) (loose) (no odor, no staining) (hydraulic fill)	
8				0.0			Boring was completed to 8' bgs. Groundwater was encountered at approximately 4' bgs. Boring was backfilled with hydrated bentonite chips.	Note: PID readings are instantaneous - not sustained
9								
10								
11								
12								
13								
14								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-2

Date(s) Drilled	**12/11/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:33 start time
0.5–1		SB-2-0-0.5		2.9		SP	Brown, medium SAND with trace gravel (dry to moist) (no odor, no staining) (base course) Grading gray-brown, medium to coarse SAND with some rusty mottling and fine laminations (dry to moist) (no odor, no staining) (hydraulic fill)	10:55
1.5–2.5		SB-2-1-2	90	2.7				10:57
2.5–3.5		SB-2-2-3		16.0		SP/SM	Gray, fine SAND with silt and woody debris (moist) (no odor, no staining) (hydraulic fill)	10:59
4 (4.0 ft ▼)							Grading wet	
4.5–5.5		SB-2-4-5		6.5				11:01
5.5–6			90	1.5				
6.5–8				0.6 0.1		SP	Gray, coarse SAND with shell fragments, decreasing woody debris (wet) (no odor, no staining) (hydraulic fill)	
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 4' bgs. Boring was backfilled with hydrated bentonite chips.	Note: PID readings are instantaneous - not sustained
9–14								

URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-3

Date(s) Drilled	**12/1/08**	Logged By	**JW**	Checked By	**DRR**

Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	13:25 start time
						SP/GP	Black-brown SAND with gravel (moist) (base course)	
1		SB-3-0-0.5				SP	Gray-brown, medium SAND with some rusty mottling (moist) (hydraulic fill) (no odor, no staining) Very thin black layer at 1.5'	13:30
2		SB-3-1-2	90					13:35
3		SB-3-2-3						13:38
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt. PID malfunctioned; readings not available.	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	# Log of Boring SB-4 Sheet 1 of 1

Date(s) Drilled	12/1/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:19 start time
		SB-4-0-0.5				SP	Dark brown, medium to coarse SAND with gravel (moist) (base course) (no odor, very thin black staining at 1')	10:30
1							Grading dark grayish-brown, medium SAND with rusty mottling, some laminations (moist) (hydraulic fill) (no odor, no staining)	10:35
2		SB-4-1-2	90				Grading as above (wet)	
2.5 ft ▼								10:37
3		SB-4-2-3						
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 2.5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt. PID malfunctioned; readings not available.	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-5** Sheet 1 of 1

Date(s) Drilled	12/1/08	Logged By JW	Checked By DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	12 feet
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe

Downhole Depth, feet	Samples: Type	Samples: Number	Samples: Recovery (%)	Samples: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-5-0-0.5		0.0		SP/SM	Dark brown, silty, medium to coarse SAND with gravel (wet) (organic soil with abrasive grit) (no odor, no staining)	9:00 start time 9:19
1		SB-5-1-2		0.0				9:43
2		SB-5-2-3	90	5.2		SP	Gray brown, medium SAND (moist) (hydraulic fill) (no odor, no staining)	9:45
3 (3.0 ft ▼)							Grading gray, medium SAND (wet) (hydraulic fill) (hydrocarbon odor, some black staining, no sheen)	
4		SB-5-4-5		2.0				9:47
5							Grading (hydrocarbon odor, no staining)	
6			90					
7								
8		SB-5-8-9		0.0			Grading (hydrocarbon odor diminishing, no staining)	9:49
9								
10			90				Grading gray, medium to coarse SAND with shell fragments and woody debris (wet) (hydraulic fill) (no odor or staining)	
11								
12							Boring was completed to 12' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips.	
13								
14								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-6

Date(s) Drilled	12/10/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	8.7 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	9:08 start time
1				0.0		SP	Brown, medium to coarse SAND and trace gravel (moist) (base course) (musty odor, no staining)	
2		SB-6-0-0.5					Grading gray-brown, medium to coarse SAND (dry to moist) (hydraulic fill) (no odor, no staining)	9:20
3		SB-6-1-2	90	0.0				9:22
							Grading 1" layer of gray fine sand and silt	
4		SB-6-2-3		0.0				9:24
5							Grading gray-brown, medium to coarse SAND with rusty mottling and thin laminations (moist) (hydraulic fill) (no odor, no staining)	
5.7 ft (groundwater) / 6		SB-6-4-5		0.0			Grading wet with rotten egg/sulfide odor at groundwater interface	9:26
7			90	0.0			Grading gray, fine SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
8								
9							Boring was completed to 8.7' bgs. Groundwater was encountered at approximately 5.7' bgs. Boring was backfilled with hydrated bentonite chips.	
10								
11								
12								
13								
14								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-7

Date(s) Drilled	**12/10/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**10.7 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	8:17 start time
0.7				2.0		SP	Dark gray SAND with trace gravel, some shell fragments (moist) (hydraulic fill) (musty odor, black staining, no sheen) Grading gray-brown, medium to coarse SAND with some rusty mottling (dry to moist) (no odor, no staining)	
1		SB-7-0-0.5						8:35
2		SB-7-1-2		0.3				8:37
3		SB-7-2-3	90	0.0				8:39
5 (5.2 ft water level)		SB-7-4-5		0.0			Grading gray-brown, fine SAND (wet) (no odor, no staining)	8:41
5.7				0.0			Grading gray, medium to coarse SAND (wet) (no odor, no staining)	Temporary well set 5'-10' groundwater sampled at 9:10
6.7				0.0				
8			90					
9							Grading gray, fine SAND (wet) (no odor, no staining)	
10.5							Grading trace woody debris	
10.7							Boring was completed to 10.7' bgs. Groundwater was encountered at approximately 5.2' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-8

Date(s) Drilled	**12/10/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**10.4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	10:04 start time
				0.0		SP	Brown SAND with small gravel (dry) (base course) ~2" thick Grading gray-brown medium to coarse SAND (dry) (hydraulic fill) (no odor, black staining at 2' bgs)	
1		SB-8-0-0.5						10:14
		SB-8-0.5-1		0.0				10:16 10:18
2		SB-8-1-2						10:20
3		SB-8-2-3	90	0.0				
4							Poor recovery 4.4'-8.4' bgs	10:22
5 (5.0 ft ▼)		SB-8-4-5		0.0				Temporary well set 5'-10' groundwater sampled at 11:00
				0.0			Grading gray fine to medium SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
6								
7								
8			90					
9								
10								
10.4							Boring was completed to 10.4' bgs. Groundwater was encountered at approximately 5.0' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	
11								
12								
13								
14								

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-9** Sheet 1 of 1

Date(s) Drilled	**12/10/08**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**10.5 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	11:08 start time
0.5						SP/SM	Gray-brown, silty SAND with fine gravel (dry to moist) (base course) (no odor)	
1.3		SB-9-0-0.5		0.0		SP	Dark brown staining - 1" thick Gray brown, medium to coarse SAND with some mottling (dry to moist) (hydraulic fill) (no odor, no staining)	11:28
2								11:30
3		SB-9-1-2	90	0.0				11:32
3.3				0.0		SM	Gray-brown, silty SAND (moist) (hydraulic fill) (no odor, no staining)	
3.5 ft (groundwater)		SB-9-2-3		0.0		SP	Dark gray, fine to medium SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
5								11:34
6		SB-9-4-5		0.0				Temporary well set 5'-10' groundwater sampled at 12:15
8			90	0.0				
10.5							Grading trace woody debris	
							Boring was completed to 10.5' bgs. Groundwater was encountered at approximately 3.5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-10** Sheet 1 of 1

Date(s) Drilled	**12/11/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Recovery (%)	SAMPLES: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-10-0-0.5		0.6		SP/SM	Dark brown stained silty SAND with gravel (moist) (hydrocarbon odor)	8:25 start time
						SP	Gray-brown, medium to coarse SAND (moist) (hydraulic fill) (no odor, no staining)	8:40
1		SB-10-1-2		0.0				8:42
2		SB-10-2-3	90	0.0			Grading gray, fine to medium SAND with woody debris (moist) (hydraulic fill) (no odor, no staining)	8:44
3 (3.25 ft ▼)		SB-10-3-4		2.9			Grading gray, medium to coarse SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	8:46
4		SB-10-4-5		1.8			Grading gray, fine to medium SAND (moist) (hydraulic fill) (no odor, no staining)	8:48
5								Temporary well set 5'-10' groundwater sampled at 9:35
6			90					
7								
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 3.25' bgs. Boring was backfilled with hydrated bentonite chips.	Note: PID readings are instantaneous not sustained
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-11

Date(s) Drilled	12/11/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	8 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-11-0-0.5		0.8		GP	Dark gray GRAVEL with silty sand (wet at surface) (fill)	12:42 start time
				0.0		SP/GP	Brown GRAVEL with silty sand (moist) (fill) (no odor, no staining)	13:05
						SP	Gray-brown medium to coarse SAND with rusty mottling and some lamination (dry to moist) (hydraulic fill) (no odor, no staining)	
1		SB-11-1-2		0.0				13:07
2		SB-11-2-3	90	4.0				13:09
3								
				12.6				
4		SB-11-4-5		3.3				13:11
5								Temporary well set 5'-10' groundwater sampled at 13:40
5.5 ft ▼								
6			90	1.2			Grading gray, fine to medium SAND (wet) (hydraulic fill) (no odor, no staining)	
7				2.8			Grading medium to coarse sand, shell fragments	
				0.7				
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 5.5' bgs. Boring was backfilled with hydrated bentonite chips.	Note: PID readings are instantaneous not sustained
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-12

Sheet 1 of 1

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0				0.0		SP/SM	Brown, silty SAND with gravel (wet) (dense) (fill) (no odor, no staining)	9:35 start time
0.5		SB-12-0-0.5		0.0		SP	Medium brown, medium SAND (dry) (hydraulic fill) (no odor, no staining)	
1								9:45
1.5				0.0			Grading gray-brown, medium to coarse SAND (dry) (hydraulic fill) (no odor, no staining)	9:47
2		SB-12-1-2	90	0.7				
2.5								9:49
3		SB-12-2-3						
3.5							Grading moist	
4				0.0				
5		SB-12-4-5						9:51
5.5				0.0			Grading wet	
6.0 ft ▼ 6			90					
7								
8				0.0			Boring was completed to 8' bgs. Groundwater was encountered at approximately 6' bgs. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard	Log of Boring SB-13
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/1/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	14:08 start time
						SP/GP	Dark brown SAND and GRAVEL with some silt (dry) (asphalt debris and base course)	
1		SB-13-0-0.5		0.0		SP	Dark gray-brown, medium SAND (moist) (hydraulic fill) (no odor, no staining)	14:20
2		SB-13-1-2	90					14:22
3		SB-13-2-3						14:24
3.5 ft ▼				0.0			Grading very dark gray, fine SAND with woody debris (wet) (hydraulic fill) (rotting wood odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3.5' bgs. Boring was backfilled with hydrated bentonite chips.	
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URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-14** Sheet 1 of 1

Date(s) Drilled	**12/1/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	15:19 start time
						SP/GP	Dark brown SAND and GRAVEL with some silt (moist) (base course)	
1		SB-14-0-0.5		0.0		SP	Dark gray-brown, medium SAND with shell fragments (moist) (hydraulic fill) (no odor, no staining)	15:25
2		SB-14-1-2	90					15:27
3		SB-14-2-3						15:30
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-15

Sheet 1 of 1

Date(s) Drilled	**12/1/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	11:11 start time
		SB-15-0-0.5				SP/SM	Dark brown, silty medium SAND with medium gravel (moist) (base course) (no odor, no staining)	11:18
1		SB-15-1-2				SP	Gray-brown, medium SAND with some rusty mottling and shell fragments (moist) (hydraulic fill) (no odor, no staining)	11:22
2		SB-15-2-3	90					11:24
3								
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt. PID malfunctioned; readings not available.	
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URS

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-16** Sheet 1 of 1

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:03 start time
						SP/SM	Dark brown, silty SAND with gravel (moist) (base course)	
1		SB-16-0-0.5				SP	Gray brown, medium to coarse SAND (dry) (hydraulic fill) (no odor, no staining)	10:08
				0.0				
2		SB-16-1-2	90					10:10
3		SB-16-2-3					Grading (moist)	10:12
				0.0				
4								
5 (5.0 ft ▼)		SB-16-4-5					Grading (wet) Grading dark gray, fine SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	10:15
				0.0				
6			90					
7								
				0.0				
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-17** Sheet 1 of 1

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**12 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-17-0-0.5		0.0		SP/SM	Dark brown, silty SAND with gravel (moist) (surficial fill) (slight hydrocarbon odor, brown staining, sheen)	8:35 start time 9:00
						SP	Gray-brown, medium SAND with some rusty mottling (dry) (hydraulic fill) (no odor, no staining)	
1		SB-17-1-2		0.0				9:03
2		SB-17-2-3	90					9:06
3								
4							Grading (moist)	
5.0 ft ▼ 5		SB-17-5-6		210			Grading wet (strong hydrocarbon odor, black staining, sheen)	9:09
6			90					
				28				
7		SB-17-7-8						9:12
8				9.2			Grading (sheen from 5'-9')	
9		SB-17-9-10					Grading (no sheen)	9:15
10			90				Grading (no odor, no sheen)	
11								
				0.1				
12							Boring was completed to 12' bgs. Groundwater was encountered at approximately 5' bgs. Boring was backfilled with hydrated bentonite chips.	
13								
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ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Project: Everett Shipyard	Log of Boring SB-18
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/4/08	Logged By JW	Checked By DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	8.2 feet
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-18-0-0.5		0.0		SP	Brown (tan), medium to coarse SAND (moist) (foundation fill) (no odor, no staining)	10:58
2		SB-18-1-2	90					11:00
3								
4		SB-18-3-4		0.0			Grading gray, poorly graded, fine to medium SAND (moist) (hydraulic fill) (no odor, no staining)	11:02
4.7 ft ▼ 5		SB-18-4-5					Grading (wet)	11:04
6			90	0.0				
7							Grading medium to coarse SAND, shell fragments	
8								
9							Boring was completed to 8.2' bgs. Groundwater was encountered at approximately 4.7' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	
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URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-19** Sheet 1 of 1

Date(s) Drilled	**12/4/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**10.7 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	11:40 start time
1		SB-19-0-0.5		0.0		SP	Brown (tan), medium to coarse SAND (moist) (fill with some abrasive grit at surface) (no odor, no staining)	11:56
2		SB-19-1-2						11:58
3		SB-19-2-3	90					12:00
4 (3.7 ft ▼)		SB-19-3-4		0.0			Grading dark gray, fine to medium SAND with some silt (wet) (hydraulic fill) (no odor, no staining)	12:02
5		SB-19-4-5						12:04
6				0.0			Grading to medium to coarse SAND with some shell fragments	Temporary well set 5'-10' groundwater sampled at 12:50 clear with some fine gray sand and rotten eggs/sulfide odor
8			90	0.0				
11							Boring was completed to 10.7' bgs. Groundwater was encountered at approximately 3.7' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

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Project: Everett Shipyard	Log of Boring SB-20
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/4/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	8 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	13:41 start time
						SP/SM	Brown, silty SAND with gravel (base course)	
1		SB-20-0-0.5		0.0		SP	Gray-brown, medium to coarse SAND (dry to moist) (hydraulic fill) (no odor, no staining)	13:56
				0.0			Grading medium gray, medium to fine SAND (dry to moist) (hydraulic fill) (no odor, no staining)	
2.0 ft ▼ 2		SB-20-1-2	90				Grading woody debris (wet)	13:58
3		SB-20-2-3						14:00
4				0.0				
5		SB-20-4-5		0.0			Grading gray, silty, fine SAND (wet) (hydraulic fill) (no odor, no staining)	14:02
6			90					
7				0.0			Grading gray, medium to coarse SAND with shell fragments (wet) (hydraulic fill) (no odor, no staining)	
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 2' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-21** Sheet 1 of 1

Date(s) Drilled	**12/2/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	12:25 start time
						SP/SM	Dark brown, silty sand with gravel (moist) (base course)	
1		SB-21-0-0.5		0.0		SP	Dark gray, coarse SAND (moist) (hydraulic fill) (slight hydrocarbon odor, no staining)	12:34
2		SB-21-1-2	90	0.0			Grading fine SAND	12:36
3		SB-21-2-3						12:38
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Log of Boring SB-22

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	**12/2/08**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	13:46 start time
0.5						SP/SM	Dark brown, silty SAND with gravel (old asphalt and base course)	
1		SB-22-0-0.5						13:54
1.25				0.0		SP	Dark gray, medium SAND (moist) (hydraulic fill) (slight hydrocarbon odor, no staining)	
2		SB-22-1-2	90	0.0				13:56
3 (3.0 ft ▼)		SB-22-2-3		0.0			Grades fine SAND (wet)	13:58
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	Note: Background PID = 1.8 ppm

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URS

Project: Everett Shipyard	Log of Boring SB-23
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/1/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						SP/SM	Dark brown, silty, fine to medium SAND with organics (moist) (fill)	14:36 start time
							Concrete debris	
1		SB-23-1-2		0.0		SP	Grading dark gray, fine SAND (moist) (hydraulic fill) (hydrocarbon odor, no staining, no sheen)	14:45
							Grading dark gray-brown, fine to medium SAND with some rusty mottling (moist) (hydraulic fill) (no odor, no staining)	
2		SB-23-2-3	90	0.0				14:48
3				0.0				
4							Grading dark gray, fine SAND (moist to wet) (hydraulic fill) (no odor, no staining)	
							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-24

Sheet 1 of 1

Date(s) Drilled	**1/6/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**4 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						SP	Gray-brown, medium to coarse SAND with wood, concrete fragments, and paint debris (moist) (0"-18" includes abrasive grit) (no odor, no staining) (fill)	start time
1		SB-24-1-2						10:35
2			90					10:37
2.5 ft ▼		SB-24-2-3				SP/SM	Gray-brown, fine SAND/silty fine SAND (wet) (hydraulic fill) (hydrocarbon odor in upper 9", no staining)	
3		SB-24-3-4						10:39
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 2.5' bgs. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-25** Sheet 1 of 1

Date(s) Drilled	**1/21/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**4 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Brown GRAVEL (base course)	
						SP	Gray-brown medium and coarse mottled SAND (moist) (hydraulic fill) (hydrocarbon odor, no staining)	
1		SB-25-1-2						11:08
							Grading finer, gray	
2		SB-25-2-3	100					11:10
						SP/SM	Gray medium and fine SAND with silty lenses (hydrocarbon odor to 3' bgs)	
3		SB-25-3-4						11:12
4							Grading very moist	
							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Gravel layer used as a marker for accumulated abrasive grit. PID malfunctioned; readings not available.	
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URS

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-26** Sheet 1 of 1

Date(s) Drilled	**12/11/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt and thin gravel layer	14:42 start time
		SB-26-0-0.5		14.4		SP/SM	Dark brown, silty SAND with trace gravel, some wood debris (moist) (fill) (hydrocarbon odor, brown staining, no sheen)	14:51
1								14:53
		SB-26-1-2		0.0		SP	Gray, medium to coarse SAND (moist) (hydraulic fill) (no odor, no staining)	
2			90					14:55
		SB-26-2-3						
3								
3.5 ft ▼				0.0			Grading gray, fine SAND with some silt, woody debris (wet) (hydraulic fill) (no odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3.5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-27

Date(s) Drilled	**12/4/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**3.8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	10:16 start time
						SP	Brown SAND with gravel (moist) (base course)	
1		SB-27-0-0.5		0.0			Grading gray brown, medium to coarse SAND with some rusty mottling (moist) (hydraulic fill) (no odor, no staining)	10:21
2 (2.3 ft ▼)		SB-27-1-2	90					10:23
							Grading gray, medium to coarse SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	10:25
3		SB-27-2-3		0.0				
4							Boring was completed to 3.8' bgs. Groundwater was encountered at approximately 2.3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-28** Sheet 1 of 1

Date(s) Drilled	12/4/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	8.7 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	9:10 start time
1				0.0		SP	Dark gray brown, medium to coarse SAND with gravel (moist) (base course, some abrasive grit present) (no odor, no staining)	
		SB-28-0-0.5		0.0				9:23
2							Grading gray-brown, medium to coarse SAND, some rusty mottling (moist) (hydraulic fill) (no odor, no staining)	
3		SB-28-1-2	90	0.0				9:25
4		SB-28-2-3						9:27
5								
5.7 ft ▼ 6		SB-28-4-5		0.0			Grading (wet)	9:29
				0.0			Grading gray, fine to medium SAND (wet) (hydraulic fill) (no odor, no staining)	
7			90					
8				0.0			Grading gray, medium to coarse SAND with shell fragments (wet) (hydraulic fill) (no odor, no staining)	
9							Boring was completed to 8.7' bgs. Groundwater was encountered at approximately 5.7' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-29** Sheet 1 of 1

Date(s) Drilled	**12/3/08**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:59 start time
						SP/SM	Dark brown, silty SAND with gravel (moist) (base course)	
1		SB-29-0-0.5		0.0		SP	Gray-brown, medium to coarse SAND with some rusty mottling (dry to moist) (hydraulic fill) (no odor, no staining)	11:05
2		SB-29-1-2	90					11:07
3		SB-29-2-3		0.0				11:09
3.5 ft ▼				0.0			Grading gray, fine to medium SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
4								
5		SB-29-4-5		0.0				11:11
6			90					
7								
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 3.5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	Note: No obvious recent backfill placement
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URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-30

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	Samples: Type	Samples: Number	Samples: Recovery (%)	Samples: OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						Asphalt	11:56 start time
0.5					SP/SM	Dark brown, silty SAND with gravel (base course)	
1		SB-30-0-0.5			SP	Dark brown-gray, medium to coarse SAND (dry to moist) (hydraulic fill with some abrasive grit near 18" bgs) (no odor)	12:00
1.5				0.0			
2		SB-30-1-2	90				12:02
3		SB-30-2-3		0.0		Grading gray	12:04
4 (4.0 ft groundwater)						Grading (wet)	
5		SB-30-4-5		0.0			12:06
6			90				
7				0.0			
8						Boring was completed to 8' bgs. Groundwater was encountered at approximately 4' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-31

Date(s) Drilled	12/1/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:40 start time
		SB-31-0-0.5				SP	Gray-brown, medium SAND and trace gravel (dry) (base course) (no odor, no staining)	10:48
1							Grading black-stained, fine SAND (hydrocarbon odor, sheen)	
		SB-31-1-2					Grading gray-brown, fine to medium SAND with some rusty mottling (moist) (hydraulic fill) (no odor, no staining)	10:50
2			90					10:52
		SB-31-2-3						
3								
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt. PID malfunctioned; readings not available.	
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Project: Everett Shipyard	**Log of Boring SB-32**
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**12/1/08**	Logged By	**JW**	Checked By	**DRR**

Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	11:40 start time
						SP/GP	Dark brown, gravelly SAND (dry) (base course)	
							Grading black/brown stained (hydrocarbon odor)	
1		SB-32-0-0.5				SP	Gray-brown, medium SAND (moist) (hydraulic fill) (slight hydrocarbon odor, no staining, no sheen)	11:50
2		SB-32-1-2	90					11:53
							Grading (wet)	
3.0 ft ▼ 3		SB-32-2-3						11:55
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt. PID malfunctioned; readings not available.	
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Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-33** Sheet 1 of 1

Date(s) Drilled	**12/2/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	9:46 start time
						SP/SM	Dark brown, silty SAND with gravel (dry) (base course) (no odor, some black staining)	
1		SB-33-0-0.5		1.2		SP	Dark gray brown, medium SAND with shell fragments (dry to moist) (hydraulic fill) (no odor, no staining)	9:50 Suspect PID reading due to moisture
2		SB-33-1-2	90					9:53
3		SB-33-2-3					Grading decreasing shell fragments	9:56
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-34** Sheet 1 of 1

Date(s) Drilled	**12/11/08**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	14:18 start time
				0.0		GP	Gray-brown GRAVEL with silt and sand (base course)	
1		SB-34-0-0.5				SP	Gray, medium to coarse SAND (moist) (hydraulic fill) (no odor, no staining)	14:24
2		SB-34-1-2	90					14:26
3 (3.0 ft ▼)		SB-34-2-3		0.0		SP/SM	Dark gray, fine SAND with silt and woody debris (wet) (hydraulic fill) (no odor, no staining)	14:28
6			90	0.0		SP	Gray, medium to coarse SAND (wet) (hydraulic fill) (no odor, no staining)	
7				0.0			Grading gray, fine SAND with little silt (wet) (hydraulic fill) (no odor, no staining)	
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-35** Sheet 1 of 1

Date(s) Drilled	**12/2/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	14:10 start time
						SP/SM	Dark brown, silty SAND with gravel (base course)	
		SB-35-0-0.5		0.0		SP	Dark gray, medium to fine SAND with shell fragments and woody debris (moist) (hydraulic fill) (hydrocarbon odor, no staining, no sheen)	14:19
1								
				0.0			Odor persists	14:21
2		SB-35-1-2	90					
				0.0			Odor persists	14:23
3		SB-35-2-3						
3.75 ft							Grading lens of coarse SAND (no odor)	
4				0.0			Grading dark gray, fine to medium SAND (wet) (hydraulic fill) (no odor, no staining)	
5				0.0			Grading dark gray, medium to coarse SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
6			90					
7							Grading increasing shell fragments	
8							Boring was completed to 8' bgs. Groundwater was encountered at approximately 3.75' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-36** Sheet 1 of 1

Date(s) Drilled	**12/2/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	12:48 start time
						SP/SM	Dark brown, silty SAND with gravel (base course)	
1		SB-36-0-0.5				SP	Black stained, medium SAND with some gravel and woody debris (moist) (hydraulic fill) (hydrocarbon odor, no sheen)	12:56
				1.4				
2		SB-36-1-2		1.3			Grading dark gray, fine to medium SAND with woody debris, some gravel (moist) (hydraulic fill) (very slight hydrocarbon odor, no staining)	12:58
3		SB-36-2-3		0.1			Grading decreasing odor	13:00
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard	Log of Boring SB-37
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/2/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:52 start time
						SP/SM	Dark brown, silty SAND with gravel (moist) (base course)	
1		SB-37-0-0.5		0.0		SP	Gray brown, medium SAND with some rusty mottling (moist) (hydraulic fill) (no odor, no staining)	10:58
2		SB-37-1-2	90					11:00
3 (3.0 ft ▼)		SB-37-2-3		0.2			Grading increasing shell fragments (wet)	11:02 Suspect PID reading due to moisture
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard	Log of Boring SB-38
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**12/2/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	9:25 start time
0.5						SP/SM	Dark brown, silty SAND with gravel (moist) (base course)	
1		SB-38-0-0.5		0.0		SP	Gray-brown, medium SAND (dry) (hydraulic fill) (no odor, no staining)	9:32
1.5				0.0			Grading gray, medium SAND with shell fragments (moist) (hydraulic fill) (no odor, no staining)	
2		SB-38-1-2	90					9:34
3		SB-38-2-3		0.0				9:36
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	Log of Boring SB-39 Sheet 1 of 1

Date(s) Drilled	12/2/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	9:00 start time
				2.7		SP/SM	Dark gray-brown, silty SAND and GRAVEL (dry) (base course) (no odor, no staining)	
1		SB-39-0-0.5		0.0		SP	Gray-brown, medium SAND with gravel (dry to moist) (hydraulic fill) (no odor, no staining)	9:10 (D)
2		SB-39-1-2	90					9:12
3		SB-39-2-3						9:14
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-40** Sheet 1 of 1

Date(s) Drilled	**12/10/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**8.4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	14:33 start time
0.4						SP/SM	Dark brown, silty SAND with gravel (moist) (base course) (no odor, no staining)	
1.5							Grading some concrete fragments, increasing gravel (dry)	
2.4		SB-40-0-0.5	90	0.0		SP	Gray-brown, medium to coarse SAND with some mottling, thin laminations noted (dry) (hydraulic fill) (no odor, no staining)	14:44
3.5		SB-40-1-2		0.0				14:46
4.5		SB-40-2-3						14:48
5.9 ft ▼							Grading (wet)	
6.5			90					
7.5				0.0			Grading dark gray, fine to medium SAND with woody debris (wet) (hydraulic fill) (no odor, no staining)	
8.4							Boring was completed to 8.4' bgs. Groundwater was encountered at approximately 5.9' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

URS

Project: Everett Shipyard	Log of Boring SB-41
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	12/10/08	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	9 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Recovery (%)	SAMPLES: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	14:01 start time
1						GP	Brown and gray pea GRAVEL, clean (moist) (base course) (no odor, no staining)	
2		SB-41-0-0.5		0.0		SP	Gray brown, medium to coarse SAND (dry to moist) (hydraulic fill) (no odor, no staining)	14:15
3		SB-41-1-2	90					14:17
4		SB-41-2-3						14:19
5				0.0			Grading shell fragments and woody debris (moist)	
6								
7 ft ▼ 7			90				Grading (wet)	
8				0.0			Grading gray, fine SAND (wet) (hydraulic fill) (no odor, no staining)	
9							Boring was completed to 9' bgs. Groundwater was encountered at approximately 7' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-42

Date(s) Drilled	**12/1/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	13:50 start time
						SP/GP	Brown SAND and GRAVEL (base course)	
		SB-42-0-0.5		0.0		SP	Dark brown, medium SAND with shell fragments and woody debris (moist) (hydraulic fill) (no odor, no staining)	13:55
1								
2		SB-42-1-2	90					13:58
3		SB-42-2-3						14:00
3.75 ft ▼								
4							Grading gray (wet)	
							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3.75' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	Log of Boring SB-43 Sheet 1 of 1

Date(s) Drilled	10/28/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	10 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Recovery (%)	SAMPLES: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						SP	Black-brown SAND with abrasive grit (fill) Grading brown medium SAND with trace gravel (moist) (hydraulic fill) (no odor, no staining)	
1		SB-43-1-2		0.0				8:20
2		SB-43-2-3	90	0.0				8:30
3								
4								
5.0 ft ▼ 5				0.0			Grading wet	Temporary well set 5'-10' Groundwater sampled at 9:10
6				0.0			Grading gray medium SAND with shell fragments (wet) (hydraulic fill) (no odor, no staining)	
7			90				Grading wood debris	
8								
9				0.0				
10							Boring was completed to 10' bgs. Groundwater was encountered at 5' bgs. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-44

Date(s) Drilled	**10/27/09**	Logged By	**MRM**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
1		SB-44-0-0.5		0.0		SP	Brown gravelly SAND (dry) (base course) (no odor, no staining) Gray medium SAND (dry) (hydraulic fill) (no odor, no staining)	8:40
2			100					
3		SB-44-2-3		0.0			Grading shell fragments	8:50
4								
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard	Log of Boring SB-45
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/27/09	Logged By	MRM	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Light brown SAND and GRAVEL (dry) (base course) (no odor, no staining)	
1		SB-45-0-0.5		0.0		SP	Light brown medium SAND (dry) (no odor, no staining)	10:40
2			100					
3		SB-45-2-3		0.0			Grading mottling	10:50
4						SP/SM	Gray silty SAND, some wood debris (moist) (no odor, no staining)	
5 (5.0 ft ▼)							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-46** Sheet 1 of 1

Date(s) Drilled	**10/27/09**	Logged By	**MRM**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP/SP	Dark brown GRAVEL with sand (dry) (base course) (no odor, no staining)	
1		SB-46-0-0.5		0.0		SP	Light brown SAND, mottled (dry) (hydraulic fill) (no odor, no staining)	9:00
2			100	0.0			Grading gray SAND with shell fragments and trace gravel (dry) (hydraulic fill) (no odor, no staining)	
3		SB-46-2-3						9:10
4								
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-47** Sheet 1 of 1

Date(s) Drilled	10/27/09	Logged By MRM	Checked By DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP	Dark brown/black GRAVEL with sand (base course)	
1		SB-47-0-0.5		0.0		SP	Brown SAND with mottling, layers of shell fragments (dry) (hydraulic fill) (no odor, no staining)	9:20 * SB-47D (9:25)
2			100				Grading gray with increasing moisture	
3		SB-47-2-3		0.0				9:30
4								
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-48

Date(s) Drilled	**11/25/09**	Logged By	**JW**	Checked By	
Drilling Contractor	**URS**	Total Depth of Borehole	**3.5 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Crushed gray rock and gray sandy GRAVEL (base course)	
		SB-48-0-0.5		0.0		SP	Brown mottled medium SAND, lots of wood debris, smells like rotting wood (moist) (hydraulic fill) (no odor, no staining)	12:25
1								* Field dup SB-112509 at 12:40
							Shell fragments	
2								
		SB-48 2-3		0.0			Grading gray with increasing shells	12:30
3								
							Boring was completed to 3.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-49** Sheet 1 of 1

Date(s) Drilled	**11/25/09**	Logged By **JW**	Checked By
Drilling Contractor	**URS**	Total Depth of Borehole	**3.75 feet**
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**
Drill Rig Type		Sampling Method	

Downhole Depth, feet	Samples: Type	Samples: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Brown sandy GRAVEL (base course)	
1		SB-49-0-0.5		0.0		SP	Brown medium SAND with shells (moist) (hydraulic fill) (no odor, no staining)	11:35
2							Grading to gray, increasing shells	
3		SB-49-0-0.5		0.0				11:40
4							Boring was completed to 3.75' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-50** Sheet 1 of 1

Date(s) Drilled	**11/25/09**	Logged By	**JW**	Checked By	
Drilling Contractor	**URS**	Total Depth of Borehole	**4 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Veneer of gray crushed rock Brown sandy GRAVEL (moist) (base course)	
1		SB-50-0-0.5		0.0		SP	Brown mottled medium SAND, some shell fragments (moist) (hydraulic fill) (no odor, no stining) Large piece of rotting wood at 18"	10:40
2								
3		SB-50-2-3		0.0				10:45
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-51** Sheet 1 of 1

Date(s) Drilled	11/25/09	Logged By JW	Checked By
Drilling Contractor	URS	Total Depth of Borehole	3.25 feet
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter
Drill Rig Type		Sampling Method	

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Gray crushed rock and brown sandy GRAVEL (base course)	
		SB-51-0-0-.5		0.0		SP	Brown medium SAND with some coarse gravel, few shell fragments (moist) (hydraulic fill) (no odor, no staining)	9:15
2		SB-51-2-3		0.0				9:25
3.25							Boring was completed to 3.25' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	

URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-52

Date(s) Drilled	11/25/09	Logged By JW	Checked By
Drilling Contractor	URS	Total Depth of Borehole	4 feet
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter
Drill Rig Type		Sampling Method	

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Gray crushed rock	
						GP	Brown sandy GRAVEL with asphalt fragments (base course)	
1		SB-52-0-0.5		0.0		SP	Brown mottled medium SAND (moist) (hydraulic fill) (no odor, no staining)	9:55
2								
3		SB-52-2-3		0.0			Increasing shell fragments	10:00
							Grading to gray	
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard	**Log of Boring SB-53**
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**10/30/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**420-Limited Access**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-53-0-0.5		0.0		SP	Yellow-brown medium SAND (moist) (hydraulic fill) (no odor, no staining)	10:50
1								
2		SB-53-2-3	85	0.0			Grading increasing fine sand (wet)	10:55
3 (3.0 ft ▼)				0.0			Grading gray medium and fine SAND (wet) (hydraulic fill) (musty odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Notes: 1. Boring inside Everett Shipyard office 2. Linoleum floor with 1 1/2" wood subfloor, 29" void to ground surface 3. Patch floor with plywood	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	Log of Boring SB-54 Sheet 1 of 1

Date(s) Drilled	10/30/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	420-Limited Access	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SB-54-0-0.5		0.0		SP	Brown medium SAND (moist) (hydraulic fill) (no odor, no staining)	10:35
1								
				0.0			Grading mottling	
2		SB-54-2-3	85					10:40
3 (3.25 ft groundwater)				0.0			Grading gray medium and fine SAND, wood debris (wet) (hydraulic fill) (no odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3.25' bgs. Boring was backfilled with hydrated bentonite chips.	
5							Notes: 1. Boring inside Everett Shipyard ofice 2. 1 1/2 thick wood floor, 32" void to ground surface 3. Standing water on ground surface 4. Patch floor with plywood	
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URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-55

Date(s) Drilled	**10/30/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						Concrete	
				0.0			
1					GP	Dark brown/black sandy GRAVEL (dry) (base course) (no odor)	
				0.0	SP	Brown medium SAND (dry) (no odor, red staining (paint?)) Grading (hydraulic fill) (no odor, no staining)	12:25 *SB-55D (12:27)
		SB-55-0-0.5					
2			90	0.0			
3							12:30
		SB-55-2-3		0.0			
4						Boring was completed to approximately 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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URS

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-56** Sheet 1 of 1

Date(s) Drilled	**10/27/09**	Logged By	**MRM**	Checked By	**DRR**

Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP	Brown sandy GRAVEL (dry) (base course)	
1		SB-56-0-0.5		0.0		SP	Gray medium SAND (wet) (hydraulic fill) (no odor, no staining)	10:20
2			100				Grading increasing fine sand	
3		SB-56-2-3						10:30
4.0 ft ▼ 4				0.0		SM	Gray silty SAND (wet) (hydraulic fill) (no odor, no staining)	
5							Boring was completed to 4.5' bgs. Groundwater was encountered at approximately 4' bgs. Boring was backfilled with hydrated bentonite chips.	
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Project: Everett Shipyard	Log of Boring SB-57
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**10/27/09**	Logged By	**MRM**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP	Dark brown sandy GRAVEL (base course)	
1		SB-57-0-0.5	100	0.0		SP	Brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	10:00
				0.0			Grading gray medium and fine SAND (dry) (no odor, no staining)	
2								
3		SB-57-2-3		0.0				10:10
4								
4.25 ft ▼							Grading wet	
5							Boring was completed to 4.5' bgs. Groundwater was encountered at approximately 4.25' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-58** Sheet 1 of 1

Date(s) Drilled	**10/29/09**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**

Downhole	Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0							Concrete	
							SP/GP	Brown gravelly SAND (dry/moist) (base course) (no odor, no staining)	
	1		SB-58-0-0.5		0.0		SP	Brown mottled medium SAND (dry) (hydraulic fill) (no odor, no staining)	10:10
	2			80					
3.0 ft ▼	3		SB-58-2-3		0.0			Grading gray medium and fine SAND, wood debris (wet) (no odor, no staining)	10:15
	4							Boring was completed to 4' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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	11								
	12								
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	14								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-59

Date(s) Drilled	**10/29/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
						SP	Yellow brown medium SAND (dry) (fill) (no odor, no staining)	
1		SB-59-0-0.5					Grading brown mottled medium SAND (dry) (hydraulic fill) (no odor, no staining)	10:20 *SB-59D (10:25)
2			80	0.0 0.0				
3 (3.0 ft ▼)		SB-59-2-3					Grading gray fine and medium SAND (wet) (no odor, no staining)	10:30
4							Grading wood debris	
							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.	
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Log of Boring SB-60

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	10/30/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	3.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	420-Limited Access	Sampling Method	GeoProbe		

Downhole Depth, feet	Samples: Type	Samples: Number	Samples: Recovery (%)	Samples: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0				0.0		SP	Gray-brown mottled SAND (dry) (hydraulic fill) (no odor, no staining)	
0.5		SB-60-0-0.5						8:55
1.5			80				Grading increasing fine SAND	
2.5		SB-60-2-3						9:00
3 (3.0 ft water level)				0.0			Grading gray medium and fine SAND, some wood debris (wet) (no odor, no staining)	
3.5							Boring was completed to 3.5' bgs. Groundwater was encountered at approximately 3' bgs. Boring was backfilled with hydrated bentonite chips.	

Notes:
1. Inside wood shop
2. 1 1/2" thick wood floor, 15" void before ground surface
3. Patch floor with concrete
4. Sawdust on ground surface

URS

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-61** Sheet 1 of 1

Date(s) Drilled	**10/30/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**3.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**420-Limited Access**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						SP	Gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	
		SB-61-0-0.5						8:40
1							Grading mottling, increasing fine sand	
			85					
2		SB-61-2-3						8:45
							Grading some lamination	
3 (3.25 ft ▼)							Grading gray medium and fine SAND (wet) (no odor, no staining)	
4							Boring was completed to 3.5' bgs. Groundwater was encountered at approximately 3.25' bgs. Boring was backfilled with hydrated bentonite chips.	
5							Notes: 1. Inside wood shop 2. 1 1/2" thick wood floor, then 15" void above bare ground 3. Patch wood floor with plywood 4. Sawdust on ground surface	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-62

Date(s) Drilled	**10/30/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**420-Limited Access**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete with plastic vapor barrier at base	
1		SB-62-SS		0.0		SP/GP	Brown gravelly SAND (wet) (base course) (no odor, no staining)	9:25 *SB-62D (9:27)
		SB-62-0-0.5		0.0			Grading grayish brown gravelly SAND (wet) (no odor, no staining)	9:30 *SB-62D2 (9:32)
2			90	0.0		SP	Brown SAND (moist) (hydraulic fill) (no door, no staining)	
				0.0			Grading black stained SAND with some gravel (not abrasive grit) (no odor, no staining)	9:35 *SB-62D3 (9:37)
3		SB-62-2-3		0.0			Grading brown SAND with mottling, trace gravel (moist) (no odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch. Notes: 1. Three probe pushes to collect volume for sampling 2. Black staining at 2.5' bgs only seen in one of three samples	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-63** Sheet 1 of 1

Date(s) Drilled	**10/30/09**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**420-Limited Access**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete with plastic vapor barrier at base	
1		SB-63-SS		0.0 0.0		SP/GP	Gray-brown gravelly SAND (wet/moist) (base course) (no odor, no staining)	9:55
2		SB-63-0-0.5				SP	Brown mottled medium SAND (dry) (hydraulic fill) (no odor, no staining)	10:00
3		SB-63-2-3					Grading increasing fine sand Grading wood debris	10:05
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-64** Sheet 1 of 1

Date(s) Drilled	**10/29/09**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
		SB-64-SS		0.0		SP/GP	Dark brown gravelly SAND (dry/moist) (base course) (no odor, no staining)	9:05
1		SB-64-0-0.5		0.0		SP	Dark brown medium SAND (no grit, no gravel) (hydraulic fill) (no odor, no staining)	9:10
				0.0			Grading brown mottled medium SAND (dry) (no odor, no staining)	
2			85					
3				0.0				9:15
		SB-64-2-3		0.0			Grading brown laminated fine SAND (dry) (no odor, no staining)	
				0.0			Grading gray laminated fine SAND, wood debris (moist) (no odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	**Log of Boring SB-65**
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**10/29/09**	Logged By	**JW**	Checked By	**DRR**

Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete with plastic vapor barrier at base	
		SB-65-SS		0.0		SP/GP	Dark brown gravelly SAND (moist) (base course) (no odor, no staining)	9:25
1		SB-65-0-0.5		0.0		SP	Brown mottled medium SAND with some shell fragments (hydraulic fill) (no odor, thin black staining at top) (no sheen)	9:30
2			85					
3		SB-65-2-3		0.0				9:35
				0.0			Grading brown laminated fine SAND (dry) (no odor, no staining)	
4							Grading gray laminated fine SAND, wood debris (moist) (no odor, no staining)	
							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Log of Boring SB-66

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	10/29/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete with plastic vapor barrier at base	
1		SB-66-SS SB-66-0-0.5		0.0 0.0		SP	Gray brown medium and coarse SAND with gravel (moist) (base course) (no odor, no staining) Brown medium SAND with trace gravel and mottling, some shell fragments (dry) (hydraulic fill) (no odor, no staining)	8:20 8:25
2			85					
3		SB-66-2-3		0.0			Grading laminated	8:30
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-67** Sheet 1 of 1

Date(s) Drilled	**10/29/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete with plastic vapor barrier at base	
		SB-67-SS		0.0		SP	Gray-brown medium and coarse SAND with gravel (moist) (base course) (no odor, no staining)	8:40 *SB-67D (8:51)
1		SB-67-0-0.5		0.0			Grading brown mottled medium SAND, some shell fragments (hydraulic fill) (no odor, some black staining 6" below top of unit, no sheen)	8:45 *SB-67D2 (8:53)
2			90					
3		SB-67-2-3		0.0			Grading increasing sand and laminations	8:50
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	# Log of Boring SB-68
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/28/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-68-SS SB-68-0-0.5		0.0 0.0		SP	Dark brown medium SAND (moist) (base course) (no odor, no staining) Grading dark brown medium and coarse SAND with trace gravel, some mottling (dry) (hydraulic fill) (no odor, no staining)	14:10 14:15
2			90					
3		SB-68-32-3		0.0			Grading laminated	14:20
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-69** Sheet 1 of 1

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-69-SS		0.0		SP	Brown SAND with gravel (base course) (moist) (no odor, no staining)	13:55
		SB-69-0-0.5		0.0			Grading brown SAND with mottling and shell fragments (dry) (hydraulic fill) (no odor, no staining*) *lens of grit/black fne and medium SAND at top of interval	14:00
2			90	0.0				
3		SB-69-2-3		0.0			Grading laminated	14:05
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-70

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-70-SS		0.0		SP	Gray-brown gravelly SAND (moist) (base course) (no odor, no staining)	12:15
		SB-70-0-0.5		0.0			Grading gray-brown with rusty mottling medium SAND (dry) (hydraulic fill) (no odor, no staining)	12:20
2			75					
3		SB-70-2-3		0.0			Grading gray-brown fine SAND with laminations (dry) (no odor, no staining)	12:25
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	# Log of Boring SB-71
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/28/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-71-SS		0.0		SP	Gray SAND with shell fragments and trace gravel (moist) (base course and hydraulic fill) (no odor, no staining)	13:35
		SB-71-0-0.5		0.0			Grading brown medium SAND with mottling (dry) (hydraulic fill) (no odor, no staining)	13:40
2			75					
3		SB-71-2-3		0.0			Grading brown fine and medium SAND, laminated (dry) (no odor, no staining)	13:45
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	# Log of Boring SB-72 Sheet 1 of 1

Date(s) Drilled	10/27/09	Logged By	MRM	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Brown gravelly SAND (dry) (base course) (no odor, no staining)	
1						SP	Brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	
		SB-72-0-0.5		0.0			Grading dark brown medium SAND with glass debris (no odor, no staining) Grading gray medium SAND with shell fragments (no odor, no staining)	13:10
2				0.0			Grading light gray-brown medium SAND (dry) (no odor, no staining)	
			85					
3								
4		SB-72-2-3		0.0			Grading some laminations	13:20
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-73

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-73-SS		0.0		SP	Dark brown gravelly SAND (moist) (base course) (no odor)	12:35
		SB-73-0-0.5		0.0			Grading brown medium SAND, shell fragments, some mottling, trace gravel (dry) (hydraulic fill) (no odor, no staining)	12:40
2			75					
3		SB-73-2-3		0.0				12:45
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	# Log of Boring SB-74 Sheet 1 of 1

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1		SB-74-SS		0.0		SP	Dark brown gravelly SAND (moist) (base course) (no odor, no staining)	13:00
		SB-74-0-0.5		0.0			Grading gray-brown medium SAND with shell fragments (hydraulic fill) (no odor, no staining)	13:05
2			75				Grading lens of black staining with oily odor (no sheen)	
3		SB-74-2-3		0.0				13:10
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	# Log of Boring SB-75
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/28/09	Logged By JW	Checked By DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	5 feet
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
2						SP	Gray-brown medium SAND with gravel (base course) (no odor, no staining)	
		SB-75-0-0.5	80				Grading gray-brown SAND, 1" piece metal (aluminum?) (no odor, no staining, three 1" layers black stained grit)	9:30
3							Grading gray-brown laminated SAND with rusty oxidation (hydraulic fill) (no odor, no staining, no sheen)	
4		SB-75-2-3						9:35
						SP/SM	Gray silty fine SAND (moist) (hydraulic fill) (no odor, no staining)	
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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Project: Everett Shipyard	Log of Boring SB-76
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1						SP	Brown gravelly SAND (dry) (base course) (no odor, no staining) Grading brown-gray medium SAND, plastic fragments at top (hydraulic fill) (no odor, no staining, no sheen)	10:50
2		SB-76-0-0.5	80	0.0			Grading lens of abrasive grit	
3								
4		SB-76-2-3		0.0			Grading gray fine SAND, wood debris, 1" laminated brown/rust sand (moist) (no odor, no staining, no sheen)	10:55
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-77

Date(s) Drilled	10/28/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1						SP	Brown gravelly SAND (base course) (no odor, no staining)	
1.5–2	◣	SB-77-0-0.5					Grading gray-brown medium SAND, some rusty mottling (hydraulic fill) (no odor, no staining, no sheen)	10:30
2			80					
3.5–4.5	◣	SB-77-2-3						10:35
4.5							Grading laminated	
							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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Date(s) Drilled	10/28/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
1						SP	Brown SAND with pea gravel (dry) (base course) (no odor, no staining) Grading brown mottled medium SAND, trace gravel, some lenses of grit, white plastic fragments (dry) (hydraulic fill) (no odor, no staining, no sheen)	
2		SB-78-0-0.5	80					10:10
3								
4		SB-78-2-3					Grading laminated	10:15
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-79** Sheet 1 of 1

Date(s) Drilled	**10/28/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	*SB-79D (9:35)
1		SB-79-0-0.5	80			SP	Brown SAND with gravel (dry) (base course) Grading brown-gray medium SAND with rusty mottling (dry) (hydraulic fill) (no odor, no staining, no sheen)	9:40
3		SB-79-2-3						9:45
4							Grading laminated	
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	

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Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-80** Sheet 1 of 1

Date(s) Drilled	**10/26/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (dry) (base course)	
1						SP	Dark brown SAND (dry) (base course) (no odor)	
		SB-80-0-0.5		0.0			Grading gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	9:20
2			85					
3								
		SB-80-2-3		0.0				9:30
4								
							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard	Log of Boring SB-81
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/26/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (dry) (base course)	
						SP	Gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	
1		SB-81-0-0.5						9:40
				0.0				
				0.0				
2		SB-81-1-2					Grading 3"-4" black stained SAND with some gravel (no odor, no sheen) Grading gray-brown medium SAND (dry) (no odor, no sheen)	9:45
			90					
3		SB-81-2-3						9:50
				0.0				
4								
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-82

Date(s) Drilled	**10/26/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (dry) (base course) (metallic odor)	
2		SB-82-0-0.5	90	0.0		SP	Gray-brown SAND, trace gravel (dry) (hydraulic fill) (no odor, no staining)	10:00
4		SB-82-2-3		0.0			Grading gray SAND with clay (wet)	10:10
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-83** Sheet 1 of 1

Date(s) Drilled	**10/26/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (dry) (base course)	
1								
		SB-83-0-0.5	90	0.0		SP	Gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	9:00
2								
3								
		SB-83-2-3		0.0			Grading some lamination and rust colored oxidized sand	9:10
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard	Log of Boring SB-84
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/26/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (dry) (base course)	
1		SB-84-0-0.5		0.0		SP	Gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	10:20
2			90					
3		SB-84-2-3		0.0				10:30
							Grading few oxidized laminations	
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-85

Sheet 1 of 1

Date(s) Drilled	**10/26/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	Samples: Type	Samples: Number	Samples: Recovery (%)	Samples: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP	Dark brown sandy gravel (dry) (base course)	
1		SB-85-0-0.5		0.0		SP	Gray brown medium SAND, few shell fragments (dry) (hydraulic fill) (no odor, no staining)	12:10
2			90					
3		SB-85-2-3		0.0				12:20
4								
5 (5.0 ft ▼)							Grading gray fine SAND (wet)	
							Boring was completed to 5' bgs. Groundwater was encountered at 5' bgs. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-86

Date(s) Drilled	**10/26/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4.5 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						SP/GP	Dark brown gravelly SAND (base course)	
1		SB-86-0-0.5		0.0		SP	Gray-brown medium SAND (dry) (hydraulic fill) (no odor, no staining)	12:30
2			90				Grading 2" fine gray sand	
3		SB-86-2-3		0.0			Grading gray-brown medium SAND (dry) (no odor, no staining) 1" fine gray sand (laminated)	12:40
4							Grading 1" fine gray sand	
5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-87** Sheet 1 of 1

Date(s) Drilled	**10/27/09**	Logged By	**JW & MRM**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**7 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Truck Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
1				0.0		SP	Gray-brown gravelly SAND (dry) (base course and fill) (no odor, no staining)	
2		SB-87-0-0.5	90				Grading gray medium and fine sand, concrete fragments (moist to wet) (hydraulic fill) (no odor, no staining)	12:30
2.5 ft ▼							Wood	
3		SB-87-2-3		0.0		SP	Gray medium and fine SAND with wood debris, shell fragments (treated wood odor, no staining)	12:35
4				0.0			Grading brown gravelly SAND (no odor, no staining)	
5			80	0.0			Grading gray medium and fine SAND, wood debris (wet) (sulfide odor, no staining)	
6								
7							Boring was completed to 7' bgs. Groundwater was encountered at 2.5'. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	Log of Boring SB-88 Sheet 1 of 1

Date(s) Drilled	10/29/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
							Foam	
1							Concrete	
		SB-88-SS		0.0		SP	Brown medium SAND with some gravel (dry) (base course) (no odor, no staining)	12:20
2		SB-88-0-0.5	75				Brown medium SAND (dry) (fill) (no odor, no staining)	12:25
3		SB-88-2-3						12:30
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	# Log of Boring SB-89
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/29/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	2 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Bobcat Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
				0.0		SP	Brown medium SAND with gravel (dry) (base course) (no odor, no staining)	12:50
1		SB-89-SS	50					
		SB-89-0-0.5		0.0				12:55
2							Refusal	
							Boring was terminated at 2' bgs due to refusal. Concrete at bottom. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-90

Date(s) Drilled	**10/29/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**4 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Concrete	
		SB-90-SS		0.0		SP	Brown gravelly SAND (dry) (base course) (no odor, no staining)	12:35
1		SB-90-0-0.5		0.0			Grading 1" dark brown staining	12:40
				0.0			Brown medium SAND, mottled with shell fragments (hydraulic fill) (no odor, no staining)	
2			90					
3		SB-90-2-3						12:45
				0.0			Grading gray medium SAND (no odor, no staining)	
4							Boring was completed to 4' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with concrete patch.	
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Project: Everett Shipyard	Log of Boring SB-91
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	10/26/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
				0.0		SP/GP	Dark brown gravelly SAND (dry) (base course)	
1		SB-91-0.0.5				SP	Gray brown medium SAND with few shell fragments (dry) (hydraulic fill) (no odor, no staining)	10:40
2			90					
3		SB-91-2-3		0.0				10:50
							Grading wood fragment	
4								
5							Boring was completed to 5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-92** Sheet 1 of 1

Date(s) Drilled	10/26/09	Logged By	JW	Checked By	DRR
Drilling Contractor	Cascade Drilling	Total Depth of Borehole	4.5 feet		
Drilling Method	GeoProbe	Drill Bit Size/Type	1 1/2" Macrocore		
Drill Rig Type	Truck Mounted	Sampling Method	GeoProbe		

Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	
						GP	Dark brown sandy gravel (dry) (base course)	
1		SB-92-0-0.5		0.0		SP	Gray brown medium SAND with few shell fragments and small gravel (dry) (hydraulic fill) (no odor, no staining)	11:10
2			90					
3								
4		SB-92-2-3		0.0			Grading increasing shell fragments	11:20
4.5							Boring was completed to 4.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
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Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SB-93** Sheet 1 of 1

Date(s) Drilled	**6/24/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**8**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows/ 6in.	SAMPLES Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
						0.0		SP/GP	GRAVEL and SAND (base course)	
						0.0		SP/SC	Gray clayey fine SAND with some silt (moist) (fill)	
	2					0.0			Grading some wood fragments	
	4									
	6					0.0			Grading (slight hydrocarbon odor)	
	8		SB-93-8						Grading (wet) (moderate hydrocarbon odor, slight sheen) 8 ft ▼	Temporary well set groundwater sampled SB-93-GW
	10		SB-93-10			0.0				
	12					0.0			Grading (slight hydrocarbon odor, slight sheen)	
	14		SB-93-14						Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 8' bgs. Boring was backfilled with bentonite.	

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Log of Boring SB-93 A

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	6/25/10	Logged By	AP	Checked By	DRR
Drilling Method	GeoProbe	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	16 feet bgs
Drill Rig Type		Drill Bit Size/Type	3 1/4" Macrocore	Ground Surface Elevation	
Groundwater Level (feet bgs)	6	Sampling Method	Grab	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
	1							SP	Dark gray fine SAND (moist) (fill) (no evidence of hydrocarbons)	
	2					0.0				
	5.5		SB-93A-6			0.0				
	6								Grading (wet) 6 ft ▼	
	9.5		SB-93A-10			0.0				
	10								Grading some shell fragments	
	14.5		SB-93A-15							
	15								Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	Log of Boring SB-94 Sheet 1 of 1

Date(s) Drilled	6/24/10	Logged By	AP	Checked By	DRR
Drilling Method	GeoProbe	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	16 feet bgs
Drill Rig Type		Drill Bit Size/Type	3 1/4" Macrocore	Ground Surface Elevation	
Groundwater Level (feet bgs)	6.5	Sampling Method	Grab	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
						0.0		SP/GP	GRAVEL and SAND (base course)	
	2							SP	Gray medium SAND (dry) (fill) (no evidence of hydrocarbons)	
	4		SB-94-5							
	6					0.0			6.5 ft Grading (wet) (slight hydrocarbon odor)	Temporary well set groundwater sampled SB-94-GW
	8					0.0			Grading (strong hydrocarbon odor, slight sheen)	
	10		SB-94-10			0.0		SP/SC	Gray medium SAND with little clay, some shell fragments (wet)	
	12									
	14		SB-94-15			0.0			Grading increasing shell fragments (strong hydrocarbon odor, heavy sheen)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6.5' bgs. Boring was backfilled with bentonite.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ URSSEA3B.GLB URSSEA3.GDT 8/3/10

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-95

Date(s) Drilled	**6/24/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**8**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SP/SC	Light gray fine to coarse SAND with some clay (dry) (fill) (no evidence of hydrocarbons)	
						0.0		SP	Gray fine SAND (moist) (slight hydrocarbon odor)	
	8		SB-95 8						8 ft ▼ Grading (wet) (no sheen)	
						0.0			Grading (moderate hydrocarbon odor, slight sheen)	Temporary well set groundwater sampled SB-95-GW
	10		SB-95 11					SC	Dark gray clayey fine SAND (soft) (moist) (no evidence of hydrocarbons)	
	12					0.0		SP/SC	Dark gray fine SAND with some clay, some shell fragments (wet) (slight odor, slight sheen)	
	14		SB-95 14							
									Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 8' bgs. Boring was backfilled with bentonite.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ URSSEA3B.GLB URSSEA3.GDT 8/3/10

Project: Everett Shipyard	Log of Boring SB-96
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	6/24/10	Logged By	AP	Checked By	DRR
Drilling Method	GeoProbe	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	16 feet bgs
Drill Rig Type		Drill Bit Size/Type	3 1/4" Macrocore	Ground Surface Elevation	
Groundwater Level (feet bgs)	9.5	Sampling Method	Grab	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP	Gray fine to coarse SAND (dry) (no evidence of hydrocarbons)	
	2					0.0				
	4									
	6								Grading (moist)	
						0.0			Grading black fine SAND (moist) (slight hydrocarbon odor, no sheen)	
	8		SB-96-8							
									9.5 ft ▼	
									Grading (wet) (slight hydrocarbon odor, slight sheen)	
	10					0.0				
			SB-96-11							
	12									
						0.0			Grading (slight hydrocarbon odor, no sheen)	
	14		SB-96-14							
									Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 9.5' bgs. Boring was backfilled with bentonite.	

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-97** Sheet 1 of 1

Date(s) Drilled	**6/24/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**7**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
						0.0		SP	Gray/brown fine to coarse SAND (dry) (fill) (no evidence of hydrocarbons)	
	2									
	4								Grading (moist)	
	6		SB-97-7							
						0.0			7 ft ▼ Grading black fine SAND (wet) (slight hydrocarbon odor, no sheen)	
	8									
	10		SB-97-11							
	12					0.0			Grading (moderate hydrocarbon odor, no sheen)	
	14		SB-97-14						Grading some shell fragments	
									Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 7' bgs. Boring was backfilled with bentonite.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ URSSEA3B.GLB URSSEA3.GDT 8/3/10

Project: Everett Shipyard	Log of Boring SB-98
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**6/24/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**7.5**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
								SP	Gray/brown fine to coarse SAND (dry) (fill) (no evidence of hydrocarbons)	
	2					0.0				
	4									
			SB-98-6						Grading (moist)	
	6									
									7.5 ft	
									Grading black fine to coarse SAND (wet) (slight hydrocarbon odor)	
	8					0.0				
								SP/SC	Black fine to coarse SAND with clay (wet) (slight hydrocarbon odor, slight sheen)	
			SB-98-10							
	10									
	12									
	14									
			SB-98-15							
	16								Boring was completed to 16' bgs. Groundwater was encountered at 7.5' bgs. Boring was backfilled with bentonite.	

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ URSSEA3B.GLB URSSEA3.GDT 8/3/10

URS

Project: Everett Shipyard	Log of Boring SB-100
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	6/25/10	Logged By	AP	Checked By	DRR
Drilling Method	GeoProbe	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	16 feet bgs
Drill Rig Type		Drill Bit Size/Type	3 1/4" Macrocore	Ground Surface Elevation	
Groundwater Level (feet bgs)	6	Sampling Method	Grab	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SP/SM	Gray fine SAND with some silt (moist) (fill) (slight hydrocarbon odor)	
	4		SB-100-5						Grading (moderate hydrocarbon odor)	
	6								6 ft ▼ Grading (wet)	
									Grading some shell fragments (moderate hydrocarbon odor, slight sheen)	
	8					0.0				
	10		SB-100-10					ML	Dark gray sandy SILT with fine sand (wet)	
								SP	Gray fine to coarse SAND with trace fine gravel (wet) (slight hydrocarbon odor)	
	12					0.0		SM	Gray silty fine SAND with some shell fragments (wet) (moderate hydrocarbon odor)	
	14		SB-100-14							
									Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

Project: Everett Shipyard	Log of Boring SB-101
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	6/25/10	Logged By	AP	Checked By	DRR
Drilling Method	GeoProbe	Drilling Contractor	Cascade Drilling	Total Depth of Borehole	16 feet bgs
Drill Rig Type		Drill Bit Size/Type	3 1/4" Macrocore	Ground Surface Elevation	
Groundwater Level (feet bgs)	6	Sampling Method	Grab	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
	1							SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SP/SM	Light gray fine to coarse SAND with some silt (moist) (fill) (slight hydrocarbon odor)	
	4.5		SB-101-5							
	5								Grading dark gray fine SAND with some silt (moist)	
	6								Grading (wet) 6 ft ▼	
	7					0.0			Grading some shell fragments	
	8								No recovery	
	11					0.0			Asphaltic layer (moderate hydrocarbon odor)	
	12								No recovery	
	14.5		SB-101-15							
	15							SP/SM	Dark brown fine to coarse SAND with some silt and fine gravel (wet) (slight hydrocarbon odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-102

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**6**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	Samples: Type	Samples: Number	Samples: Blows/ 6in.	Samples: Recovery (%)	Samples: OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SM	Gray fine to coarse SAND with silt (moist) (no evidence of hydrocarbons)	
	4		SB-102-5							
						0.0		SP/SM	Grading dark gray fine SAND with silt (moist) (slight hydrocarbon odor)	
	6								6 ft ▼ Grading (wet) (moderate hydrocarbon odor, moderate sheen)	
								ML	Dark gray SILT, some mica (wet)	
	8									
	10					0.0		ML/CL	Dark gray clayey SILT, some mica (wet)	
			SB-102-11					ML/SM	Dark gray sandy SILT with fine sand, some mica (wet)	
									Wood	
	12					0.0		SM	Dark gray sandy SILT with fine sand, some mica (wet)	
			SB-102-14							
	14									
									Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SB-103** Sheet 1 of 1

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs) **6**		Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES: Type	SAMPLES: Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	Gray coarse SAND and fine GRAVEL (dry) (base course)	
	2					0.0		SP	Dark gray fine SAND (moist) (fill) (no evidence of hydrocarbons)	
	4								Grading some shell fragments	
	6		SB-103-6						6 ft ▽	
									Grading (wet)	
	8									
								SC	Dark gray fine SAND and CLAY (soft) (wet)	
	10		SB-103-10						Grading CLAY and fine SAND (soft) (moist)	
						0.0			Grading (slight hydrocarbon odor, slight sheen)	
	12		SB-103-13						Grading fine SAND and CLAY (wet) (moderate hydrocarbon odor, moderate sheen)	
						0.0				
	14								Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

Log of Boring SB-104

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**8**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows/ 6in.	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SM	Dark gray silty fine SAND, some shell fragments (moist) (fill) (no evidence of hydrocarbons)	
	4								Grading (slight hydrocarbon odor)	
			SB-104-5							
	6					0.0				
	8								8 ft ▼ Grading (wet)	
									Wood (creosote odor)	
	10									
	12								No recovery	
	14									
									Wood	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 8' bgs. Boring was backfilled with bentonite.	

URS

Log of Boring SB-105

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**16**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2					0.0		SP	Gray fine SAND, some shell fragments (moist) (fill) (no evidence of hydrocarbons)	
	6		SB-105-6						Grading (wet)	
								ML	Dark gray SILT and fine SAND, some mica and shells (wet)	
	10		SB-105-11			0.0		CL/ML	Dark gray silty CLAY (moist) (slight hydrocarbon odor)	
	12								Wood fragments (slight hydrocarbon odor, slight sheen on wood chunks)	
	16								16 ft ▼ Boring was completed to 16' bgs. Groundwater was encountered at 16' bgs. Boring was backfilled with bentonite.	

URS

Project: Everett Shipyard	Log of Boring SB-106
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**6**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows/ 6in.	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2							SM	Dark gray fine SAND and SILT (moist) (fill) (no evidence of hydrocarbons)	
						0.0				
	4		SB-106-5							
	6								6 ft Grading (wet)	
	8									
			SB-106-10					SC	Dark gray sandy CLAY (firm) (moist)	
	10							SP	Dark gray fine SAND, some shell fragments (wet)	
	12							SM	Dark gray SILT and fine SAND (soft) (wet)	
			SB-106-14							
	14								Wood (creosote odor)	
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SB-107

Date(s) Drilled	**6/25/10**	Logged By	**AP**	Checked By	**DRR**
Drilling Method	**GeoProbe**	Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**16 feet bgs**
Drill Rig Type		Drill Bit Size/Type	**3 1/4" Macrocore**	Ground Surface Elevation	
Groundwater Level (feet bgs)	**6**	Sampling Method	**Grab**	Hammer Data	
Borehole Backfill		Location			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Blows/ 6in.	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0								Asphalt	
								SP/GP	GRAVEL and SAND (base course)	
	2									
						0.0		SM	Gray fine SAND with some silt, some shell fragments (moist) (fill) (no evidence of hydrocarbons)	
	4									
			SB-107-5							
									Grading increasing silt	
	6								Grading (wet)	6 ft ▼
	8									
								ML	Dark gray SILT, some mica (wet) (no hydrocarbon odor or sheen)	
	10		SB-107-10			0.0				
	12							SP	Dark gray fine SAND (wet)	
			SB-107-13							
									Wood (creosote odor)	
	14									
	16								Boring was completed to 16' bgs. Groundwater was encountered at 6' bgs. Boring was backfilled with bentonite.	

URS

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SS-30** Sheet 1 of 1

Date(s) Drilled	1/21/09	Logged By	JW	Checked By	DRR
Drilling Contractor	URS	Total Depth of Borehole	0.5 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-30	100			SP	Abrasive grit and paint chips at surface Brown medium and coarse SAND with gravel (moist) (hydraulic fill) (no odor, no staining)	10:06
							Boring was completed to 0.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SS-31

Date(s) Drilled	**1/21/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**0.5 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-31	100			SP	Dark brown gravelly medium and coarse SAND with abrasive grit (moist) (fill) (no odor, no staining)	10:17
							Boring was completed to 0.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

Project: Everett Shipyard Project Location: Everett, Washington Project Number: 33761354	**Log of Boring SS-32** Sheet 1 of 1

Date(s) Drilled	**1/6/09**	Logged By **JW**	Checked By **DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**0.5 feet**
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**
Drill Rig Type		Sampling Method	

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-32-0-0.5	100			SP	Gray-brown, medium to coarse SAND (moist) (fill, contains abrasive grit) (no odor, no staining)	12:26 Duplicate SS-010609
							Boring was completed to 6" bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

Project: Everett Shipyard	Log of Boring SS-33
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**1/6/09**	Logged By	**JW**	Checked By	**DRR**

Drilling Contractor	**URS**	Total Depth of Borehole	**0.5 feet**
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**
Drill Rig Type		Sampling Method	

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-33-0-0.5	100			SP	Dark brown, medium to coarse SAND (moist) (0-5" contains abrasive grit) (no odor, no staining) Grading brown, cean, medium to coarse SAND (no abrasive grit)	12:20
							Boring was completed to 6" bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SS-34** Sheet 1 of 1

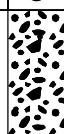
Date(s) Drilled	**1/21/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**0.5 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-34	100			SP	Tan medium and coarse SAND, some paint chips, abrasive grit, vegetative debris at surface (moist) (fill) (no odor)	10:30 DUP=SS-012109 (10:42)
							Boring was completed to 0.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

URS

Project: Everett Shipyard	Log of Boring SS-35
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	1/6/09	Logged By	JW	Checked By	DRR
Drilling Contractor	URS	Total Depth of Borehole	0.5 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-35-0-0.5	100			GP	Brown GRAVEL with sand (wet) (fill, plant debris and abrasive grit) (no odor, no staining)	12:30
							Boring was completed to 6" bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SS-36

Sheet 1 of 1

Date(s) Drilled	**1/6/09**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**URS**	Total Depth of Borehole	**0.5 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type	**2 1/2" Diameter**		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-36-0-0.5	100			SP	Dark brown, medium to coarse SAND (dry to moist) (fill with abrasive grit) (no odor, no staining)	11:52
							Boring was completed to 6" bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 3/1/10

URS

Project: Everett Shipyard	Log of Boring SS-37
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	1/21/09	Logged By	JW	Checked By	DRR
Drilling Contractor	URS	Total Depth of Borehole	0.5 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		SS-37	100			SP	Grit at surface Dark brown medium and coarse SAND with some silt (moist) (no odor, some black/brown staining) (fill) Grading fine gravel	9:53
							Boring was completed to 0.5' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

URS

Project: Everett Shipyard	
Project Location: Everett, Washington	**Log of Boring SS-38**
Project Number: 33761354	Sheet 1 of 1

Date(s) Drilled	1/6/09	Logged By	JW	Checked By	DRR
Drilling Contractor	URS	Total Depth of Borehole	0.5 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type	2 1/2" Diameter		
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						GP	Gravel surface (fill)	
		SS-38-0-0.5	100			SP	Dark brown, medium to coarse SAND (moist to wet) (fill with abrasive grit) (no odor, no staining)	12:04
							Boring was completed to 6" bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. PID malfunctioned; readings not available.	
1								
2								
3								
4								
5								

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring SS-39

Date(s) Drilled	**12/4/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**2 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Number	Recovery (%)	OVM (ppm)	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0					Asphalt	8:28 start time 8:45
	SS-39-0-0.5		0.0	SP/SM	Black silty SAND with gravel (moist) (soft) (base course) (hydrocarbon odor, staining, no sheen)	8:47
1	SS-39-0.5-1	100	0.0	SP	Medium brown, medium SAND with gravel (moist) (base course or artificial fill) (slight hydrocarbon odor, no staining, no sheen) Grading gray-brown, medium to coarse SAND (moist) (hydraulic fill) (no odor, no staining)	8:49
	SS-39-1-2		0.0			
2					Boring was completed to 2' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
3						
4						
5						

Project: Everett Shipyard	Log of Boring SS-40
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**2 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt	10:35 start time
						SP/SM	Dark brown/black, silty SAND with gravel and woody debris (base course)	
1		SS-40-0-0.5	100	0.0		SP	Gray-brown, medium SAND with some rusty mottling (dry) (hydraulic fill) (no odor, no staining)	10:37
2							Boring was completed to 2' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
3								
4								
5								

Project: Everett Shipyard **Project Location: Everett, Washington** **Project Number: 33761354**	**Log of Boring SS-41** Sheet 1 of 1

Date(s) Drilled	**12/3/08**	Logged By	**JW**	Checked By	**DRR**
Drilling Contractor	**Cascade Drilling**	Total Depth of Borehole	**2 feet**		
Drilling Method	**GeoProbe**	Drill Bit Size/Type	**1 1/2" Macrocore**		
Drill Rig Type	**Bobcat Mounted**	Sampling Method	**GeoProbe**		

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0							Asphalt and debris	14:29 start time
						SP/SM	Brown, silty medium to coarse SAND with gravel (moist) (base course)	
						SP	Gray-brown, medium to coarse SAND (dry) (hydraulic fill with discontinuous abrasive grit) (no odor, no staining)	14:36
1		SS-41-0-0.5	100	0.0				
		SS-41-0.5-1						14:40
							Grading no abrasive grit at 2' bgs	
2							Boring was completed to 2' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips. Surface was restored with cold patch asphalt.	
3								
4								
5								

APPENDIX C

PRELIMINARY SCREENING LEVELS

Table 1
Screening Levels for Soil
Everett Shipyard

	Screening Levels				
	Method A [a]	**Method B - Soil Direct Contact [a]**		**Protection of Marine Surface Water**	**Most Stringent Value**
	Unrestricted Land Use	Carcinogenic	Non-Carcinogenic	**(WAC 173-201A-240) [b]**	
VOCs (ug/kg) [Method 8260B]					
1,1,1,2-Tetrachloroethane	NE	38,461	2,400,000	NE	38,461
1,1,1-Trichloroethane	2,000	NE	160,000,000	NE	2,000
1,1,2,2-Tetrachloroethane	NE	5,000	1,600,000	NE	5,000
1,1,2-Trichloro-1,2,2-trifluoroethane	NE	NE	2,400,000,000	NE	2,400,000,000
1,1,2-Trichloroethane	NE	17,544	320,000	NE	17,544
1,1-Dichloroethane	NE	NE	16,000,000	NE	16,000,000
1,1-Dichloroethene	NE	NE	4,000,000	NE	4,000,000
1,1-Dichloropropene	NE	NE	NE	NE	NE
1,2,3-Trichlorobenzene	NE	NE	NE	NE	NE
1,2,3-Trichloropropane	NE	33.3	320,000	NE	33.3
1,2,4-Trichlorobenzene	NE	34,500	800,000	NE	34,500
1,2,4-Trimethylbenzene	NE	NE	NE	NE	NE
1,2-Dibromo-3-chloropropane	NE	1,250	16,000	NE	1,250
1,2-Dibromoethane (EDB)	5	50	720,000	NE	5
1,2-Dichlorobenzene	NE	NE	7,200,000	NE	7,200,000
1,2-Dichloroethane (EDC)	NE	10,989	1,600,000	NE	10,989
1,2-Dichloropropane	NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	NE	NE	800,000	NE	800,000
1,3-Dichlorobenzene	NE	NE	NE	NE	NE
1,3-Dichloropropane	NE	NE	NE	NE	NE
1,4-Dichlorobenzene	NE	NE	NE	NE	NE
2,2-Dichloropropane	NE	NE	NE	NE	NE
2-Butanone (methyl ethyl ketone)	NE	NE	48,000,000	NE	48,000,000
2-Chloroethylvinylether	NE	NE	NE	NE	NE
2-Chlorotoluene	NE	NE	1,600,000	NE	1,600,000
2-Hexanone	NE	NE	NE	NE	NE
4-Chlorotoluene	NE	NE	NE	NE	NE
4-Isopropyltoluene	NE	NE	NE	NE	NE
4-Methyl-2-pentanone (methyl isobutyl ketone)	NE	NE	6,400,000	NE	6,400,000
Acetone	NE	NE	72,000,000	3,200	3,200
Acrolein	NE	NE	40,000	NE	40,000
Acrylonitrile	NE	1,852	NE	NE	1,852
Benzene	30	18,182	320,000	NE	30
Bromobenzene	NE	NE	NE	NE	NE
Bromochloromethane	NE	NE	NE	NE	NE
Bromodichloromethane	NE	16,129	1,600,000	NE	16,129
Bromoethane	NE	NE	NE	NE	NE
Bromoform	NE	126,582	1,600,000	NE	126,582
Bromomethane	NE	NE	112,000	NE	112,000
Carbon disulfide	NE	NE	8,000,000	5,600	5,600
Carbon tetrachloride	NE	14,300	320,000	NE	14,300
Chlorobenzene	NE	NE	1,600,000	NE	1,600,000
Chloroethane	NE	NE	NE	NE	NE
Chloroform	NE	NE	800,000	NE	160,000
Chloromethane	NE	NE	NE	NE	NE
cis-1,2-dichloroethene	NE	NE	160,000	NE	160,000
cis-1,3-dichloropropene	NE	10,000	2,400,000	NE	10,000
Dibromochloromethane	NE	11,905	1,600,000	NE	11,905
Dibromomethane	NE	NE	NE	NE	NE
Dichlorodifluoromethane	NE	NE	16,000,000	NE	16,000,000
Ethylbenzene	6,000	NE	8,000,000	NE	6,000
Hexachloro-1,3-butadiene	NE	12,821	80,000	NE	12,821
Iodomethane	NE	NE	NE	NE	NE
Isopropylbenzene	NE	NE	8,000,000	NE	8,000,000
m,p-xylene	9000 [e]	NE	16,000,000	NE	9,000
Methyl tert-butyl ether (MTBE)	100	NE	NE	NE	100
Methylene chloride	20	133,333	4,800,000	NE	20
Naphthalene	5,000	NE	1,600,000	NE	5,000
n-Butylbenzene	NE	NE	NE	NE	NE
n-Propylbenzene	NE	NE	8,000,000	NE	8,000,000
o-Xylene	NE	NE	16,000,000	NE	16,000,000
sec-Butylbenzene	NE	NE	NE	NE	NE
Styrene	NE	NE	16,000,000	NE	16,000,000
tert-Butylbenzene	NE	NE	NE	NE	NE
Tetrachloroethene	50	1,900	800,000	4.1	4.1
Toluene	7,000	NE	6,400,000	NE	7,000
trans-1,2-Dichloroethene	NE	NE	1,600,000	NE	1,600,000
trans-1,3-Dichloropropene	NE	10,000	2,400,000	NE	10,000
trans-1,4-Dichloro-2-butene	NE	NE	NE	NE	NE
Trichloroethene	30	11,000	24,000	NE	30

Table 1
Screening Levels for Soil
Everett Shipyard

	Screening Levels				
	Method A [a]	**Method B - Soil Direct Contact** [a]		**Protection of Marine Surface Water (WAC 173-201A-240)** [b]	**Most Stringent Value**
	Unrestricted Land Use	Carcinogenic	Non-Carcinogenic		
Trichlorofluoromethane	NE	NE	24,000,000	NE	24,000,000
Vinyl acetate	NE	NE	80,000,000	NE	80,000,000
Vinyl Chloride	NE	1,390	240,000	NE	1,390
SVOCs (ug/kg) [Method 8270D]					
1,2,4-Trichlorobenzene	NE	34,500	800,000	NE	34,500
1,2-Dichlorobenzene	NE	NE	7,200,000	NE	7,200,000
1,3-Dichlorobenzene	NE	NE	NE	NE	NE
1,4-Dichlorobenzene	NE	NE	NE	NE	NE
1-Methylnaphthalene	NE	34,500	NE	NE	34,500
2,2'-Oxybis(1-chloropropane)	NE	14	3,200	NE	14
2,4,5-Trichlorophenol	NE	NE	8,000,000	NE	8,000,000
2,4,6-Trichlorophenol	NE	90,909	80,000	NE	80,000
2,4-Dichlorophenol	NE	NE	240,000	NE	240,000
2,4-Dimethylphenol	NE	NE	1,600,000	NE	1,600,000
2,4-Dinitrophenol	NE	NE	160,000	NE	160,000
2,4-Dinitrotoluene	NE	NE	160,000	NE	160,000
2,6-Dinitrotoluene	NE	NE	80,000	NE	80,000
2-Chloronaphthalene	NE	NE	6,400	NE	6,400
2-Chlorophenol	NE	NE	400,000	NE	400,000
2-Methylnaphthalene	NE	NE	320,000	NE	320,000
2-Methylphenol	NE	NE	4,000	NE	4,000
2-Nitroaniline	NE	NE	800,000	NE	800,000
2-Nitrophenol	NE	NE	NE	NE	NE
3,3'-Dichlorobenzidine	NE	2,222	NE	NE	2,222
3-Nitroaniline	NE	NE	NE	NE	NE
4,6-Dinitro-2-methylphenol	NE	NE	NE	NE	NE
4-Bromophenyl-phenyl ether	NE	NE	NE	NE	NE
4-Chloro-3-methylphenol	NE	NE	NE	NE	NE
4-Chloroaniline	NE	5,000	320,000	NE	5,000
4-Chlorophenyl-phenyl ether	NE	NE	NE	NE	NE
4-Methylphenol	NE	NE	400	NE	NE
4-Nitroaniline	NE	NE	NE	NE	NE
4-Nitrophenol	NE	NE	NE	NE	NE
Acenaphthene	NE	NE	4,800,000	65,000	65,000
Acenaphthylene	NE	NE	NE	NE	NE
Anthracene	NE	NE	24,000,000	12,000,000	12,000,000
Benzo(a)anthracene	NE	See Note d	NE	130	130
Benzo(a)pyrene	100	137	NE	350	100
Benzo(b)fluoranthene	NE	See Note d	NE	430	430
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE
Benzo(k)fluoranthene	NE	See Note d	NE	430	430
Benzoic acid	NE	NE	320,000,000	260,000	260,000
Benzyl alcohol	NE	NE	8,000,000	NE	8,000,000
Bis-(2-chloroethoxy)methane	NE	NE	NE	NE	NE
Bis-(2-chloroethyl)ether	NE	909	NE	NE	909
Bis(2-Ethylhexyl)phthalate	NE	71,429	1,600,000	4,900	4,900
Butylbenzylphthalate	NE	526,000	16,000,000	360,000	360,000
Carbazole	NE	NE	NE	NE	NE
Chrysene	NE	See Note d	NE	140	140
Dibenzo(a,h)anthracene	NE	See Note d	NE	640	640
Dibenzofuran	NE	NE	80,000	NE	80,000
Diethylphthlalate	NE	NE	64,000,000	160,000	160,000
Dimethylphthalate	NE	NE	NE	NE	NE
Di-n-butylphthalate	NE	NE	8,000,000	100,000	100,000
Di-n-octylphthalate	NE	NE	NE	5,300,000	5,300,000
Fluoranthene	NE	NE	3,200,000	89,000	89,000
Fluorene	NE	NE	3,200,000	550,000	550,000
Hexachlorobenzene	NE	625	64,000	NE	625
Hexachlorobutadiene	NE	12,821	80,000	NE	12,821
Hexachlorocyclopentadiene	NE	NE	480,000	NE	480,000
Hexachloroethane	NE	71,429	80,000	NE	71,429
Indeno(1,2,3-cd)pyrene	NE	See Note d	NE	1,300	1,300
Isophorone	NE	1,052,632	16,000,000	NE	1,052,632
Naphthalene	5000 [c]	NE	1,600,000	140,000	5000 [c]
Nitrobenzene	NE	NE	160,000	NE	160,000
N-Nitroso-di-n-propylamine	NE	143	NE	NE	143
N-Nitrosodiphenylamine	NE	204,082	NE	180	180
Pentachlorophenol	NE	2,500	400,000	47	47
Phenanthrene	NE	NE	NE	NE	NE
Phenol	NE	NE	24,000,000	5,000,000	5,000,000
Pyrene	NE	NE	2,400,000	3,500,000	2,400,000

Table 1
Screening Levels for Soil
Everett Shipyard

	Screening Levels				
	Method A [a]	**Method B - Soil Direct Contact [a]**		**Protection of Marine Surface Water (WAC 173-201A-240) [b]**	**Most Stringent Value**
	Unrestricted Land Use	Carcinogenic	Non-Carcinogenic		
PAHs (ug/kg) [Method 8270 SIM]					
1-Methylnaphthalene	NE	34,500	NE	NE	34,500
2-Methylnaphthalene	NE	NE	320,000	NE	320,000
Acenaphthene	NE	NE	4,800,000	NE	4,800,000
Acenaththylene	NE	NE	NE	NE	NE
Anthracene	NE	NE	24,000,000	NE	24,000,000
Benzo(a)anthracene	NE	See Note d	NE	NE	NE
Benzo(a)pyrene	100	137	NE	NE	100
Benzo(b)fluoranthene	NE	See Note d	NE	NE	NE
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE
Benzo(k)fluoranthene	NE	See Note d	NE	NE	NE
Chrysene	NE	See Note d	NE	NE	NE
Dibenzo(a,h)anthracene	NE	See Note d	NE	NE	NE
Dibenzofuran	NE	NE	80,000	NE	80,000
Fluoranthene	NE	NE	3,200,000	NE	3,200,000
Fluorene	NE	NE	3,200,000	NE	3,200,000
Indeno(1,2,3-cd)pyrene	NE	See Note d	NE	NE	NE
Naphthalene	5000 [c]	NE	1,600,000	NE	5000 [c]
Phenanthrene	NE	NE	NE	NE	NE
Pyrene	NE	NE	2,400,000	NE	2,400,000
PCBs (ug/kg) B [Method 8082A]					
Aroclor 1016	NE	NE	5,600	NE	5,600
Aroclor 1221	NE	NE	NE	NE	NE
Aroclor 1232	NE	NE	NE	NE	NE
Aroclor 1242	NE	NE	NE	NE	NE
Aroclor 1248	NE	NE	NE	NE	NE
Aroclor 1254	NE	NE	1,600	NE	1,600
Aroclor 1260	NE	NE	NE	NE	NE
Total PCBs	1,000	500	NE	NE	500
TPH (acid+silica gel cleanup) (mg/kg) [Ecology NWTPH-Dx]					
Diesel-range	2,000	NE	NE	NE	2,000
Oil-range	2,000	NE	NE	NE	2,000
Organotins (ug/kg) [Method PSEP/Krone 1988]					
Tributyltin as TBT Ion	NE	NE	24,000 [f]	7,400 [g]	7,400
Dibutyl Tin Ion	NE	NE	NE	NE	NE
Butyl Tin Ion	NE	NE	NE	NE	NE
Metals (mg/kg) [Method 6010/7471]					
Arsenic	20	0.67	24	0.057	0.057
Antimony	NE	NE	32	NE	32
Beryllium	NE	NE	160	NE	160
Cadmium	2	NE	80	1.2	1.20
Chromium	2,000 (Cr^{+3}) / 19 (Cr^{+6})	NE	120,000 (Cr^{+3}) / 240 (Cr^{+6})	19	19.0
Copper	NE	NE	3,200	1.10	1.10
Lead	250	NE	NE	1,600	250
Mercury	2	NE	NE	0.026	0.026
Nickel	NE	NE	1,600	11.0	11.0
Selenium	NE	NE	400	NE	400
Silver	NE	NE	400	0.32	0.32
Thallium	NE	NE	NE	NE	NE
Zinc	NE	NE	24,000	100	100

Notes:
NE - Not established
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
[a] MTCA - Model Toxics Control Act Cleanup Regulation, WAC 173-340. 2006 and 2011 MTCA Method A and B values are from Ecology website CLARC tables downloaded April 2011 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx), when available. If MTCA Method A and B values were not available or not established on the Ecology website CLARC tables, the 2001 MTCA values were used. 2001 Method A values are from Ecology Publication 94-06 amended February 12, 2001. 2011 Method B values are from Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC) Version 3.1, Ecology Publication #94-145 Updated April 2011.
b The screening levels for protection of surface water were calculated for PCOCs detected in site media using default parameters as described in WAC 173-340-747(4)(b) and the most stringent surface water screening level shown in Table 2. If no surface water screening level was available, the most stringent potable water screening level shown in Table 2 was used. See Table 1b for values used in calculations.
c Screening level based on total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
[d] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method A or B cleanup level for benzo(a)pyrene and most stringent surface water screening level shown in Table 2.
[e] The screening level is for total xylenes.
[f] The screening level is for tributyl tin oxide and was calculated using an oral RfD of 0.0003 mg/kg-day. The TBT ion value is based on weights of one mole TBTO and two moles of TBT ion.
[g] TBT ion value calculated by Ecology using marine surface water standard of 0.01 ug/l for TBTO; the TBT ion value is based on the weights of one mole of TBTO and two moles of TBT ion.

Table 2
Screening Levels for Groundwater
Everett Shipyard

	Screening Levels [a]																
	Potable Groundwater						**Surface Water**										
	MTCA			**EPA MCLs**	**EPA MCLGs**	**State MCLs**	**MTCA**		**Toxic Substances Criteria (WAC 173-201A)**		**National Recommended Water Quality Criteria**			**National Toxics Rule**			**Most Stringent Value** [k]
	Method A	**Method B - Human Health Protection**					**Method B - Human Health Protection**		Marine Water		Saltwater		Human Health	Saltwater		Human Health	
		Carcinogenic	Non-carcinogenic				Carcinogenic	Non-carcinogenic	Acute	Chronic	CMC	CCC	Organism Only	CMC	CCC	Organism Only	
VOCs (ug/L) [Method 8260B]																	
1,1,1,2-Tetrachloroethane	NE	1.7	240	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.7
1,1,1-Trichloroethane	200	NE	16,000	200	200	200	NE	926,000	NE	NE	NE	NE	NE	NE	NE	NE	926,000
1,1,2,2-Tetrachloroethane	NE	0.22	160	NE	NE	NE	6.5	10,400	NE	NE	NE	NE	4.0	NE	NE	11	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	NE	NE	240,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	240,000
1,1,2-Trichloroethane	NE	0.77	32	5	3	5	25	2,304	NE	NE	NE	NE	16	NE	NE	42	16
1,1-Dichloroethane	NE	NE	1,600	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,600
1,1-Dichloroethene	NE	NE	400	7	7	7	NE	23,100	NE	NE	NE	NE	7,100	NE	NE	3.24	3.24
1,1-Dichloropropene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
1,2,3-Trichlorobenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
1,2,3-Trichloropropane	NE	0.0015	32	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.0015
1,2,4-Trichlorobenzene	NE	1.51	80	70	70	70	1.96	227	NE	NE	NE	NE	70	NE	NE	NE	1.96
1,2,4-Trimethylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	400
1,2-Dibromo-3-chloropropane	NE	0.0547	1.6	0.2	0	0.2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.031
1,2-Dibromoethane (EDB)	0.01	0.0219	72	0.05	0	0.05	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.00051
1,2-Dichlorobenzene	NE	NE	720	600	600	600	NE	4,196	NE	NE	NE	NE	1,300	NE	NE	NE	1,300
1,2-Dichloroethane (EDC)	5	0.48	160	5	0	5	59	43,200	NE	NE	NE	NE	37	NE	NE	99	37
1,2-Dichloropropane	NE	NE	NE	5	0	5	NE	NE	NE	NE	NE	NE	15	NE	NE	NE	15
1,3,5-Trimethylbenzene	NE	NE	80	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	80
1,3-Dichlorobenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	960	NE	NE	NE	960
1,3-Dichloropropane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
1,4-Dichlorobenzene	NE	NE	NE	75	75	75	NE	NE	NE	NE	NE	NE	190	NE	NE	NE	190
2,2-Dichloropropane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
2-Butanone	NE	NE	4,800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4,800
2-Chloroethylvinylether	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
2-Chlorotoluene	NE	NE	160	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	160
2-Hexanone	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Chlorotoluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Isopropyltoluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Methyl-2-pentanone	NE	NE	640	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	640
Acetone	NE	NE	7200	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	7200
Acrolein	NE	NE	4	NE	NE	NE	NE	NE	NE	NE	NE	NE	290	NE	NE	780	290
Acrylonitrile	NE	0.081	NE	NE	NE	NE	0.4	NE	NE	NE	NE	NE	0.25	NE	NE	0.66	0.25
Benzene	5	0.8	32	5	0	5	23	1,990	NE	NE	NE	NE	51	NE	NE	71	23
Bromobenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Bromochloromethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Bromodichloromethane	NE	0.71	160	NE	0	80	28	13,827	NE	NE	NE	NE	17	NE	NE	22	17
Bromoethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Bromoform	NE	5.5	160	80	80	80	218	13,827	NE	NE	NE	NE	140	NE	NE	360	140
Bromomethane	NE	NE	11	NE	NE	NE	NE	967	NE	NE	NE	NE	1,500	NE	NE	4,000	967
Carbon disulfide	NE	NE	800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	800
Carbon tetrachloride	NE	0.625	32	5	0	5	4.94	553	NE	NE	NE	NE	1.6	NE	NE	4.4	1.6
Chlorobenzene	NE	NE	160	100	100	100	NE	5,034	NE	NE	NE	NE	1,600	NE	NE	21,000	1,600
Chloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Chloroform	NE	NE	80	80	0	80	NE	6,913	NE	NE	NE	NE	470	NE	NE	470	470
Chloromethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0
cis-1,2-Dichloroethene	NE	NE	16	70	70	70	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	70
cis-1,3-Dichloropropene	NE	0.44	240	NE	NE	NE	33.9	40,721	NE	NE	NE	NE	21	NE	NE	1,700 [j]	21
Dibromochloromethane	NE	0.52	160	80	60	80	21	13,827	NE	NE	NE	NE	13	NE	NE	34	13
Dibromomethane	NE	NE	NE	5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	5

Table 2
Screening Levels for Groundwater
Everett Shipyard

	Screening Levels [a]																
	Potable Groundwater						Surface Water										
	MTCA			EPA MCLs	EPA MCLGs	State MCLs	MTCA		Toxic Substances Criteria (WAC 173-201A)		National Recommended Water Quality Criteria			National Toxics Rule			Most Stringent Value [k]
	Method A	Method B - Human Health Protection					Method B - Human Health Protection		Marine Water		Saltwater		Human Health	Saltwater		Human Health	
		Carcinogenic	Non-carcinogenic				Carcinogenic	Non-carcinogenic	Acute	Chronic	CMC	CCC	Organism Only	CMC	CCC	Organism Only	
VOCs (ug/L) [Method 8260B] (cont.)																	
Dichlorodifluoromethane	NE	NE	1,600	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,600
Ethylbenzene	700	NE	800	700	700	700	NE	6,913	NE	NE	NE	NE	2,100	NE	NE	29,000	2,100
Hexachlorobutadiene	NE	0.56	8	NE	NE	NE	30	933	NE	NE	NE	NE	NE	NE	NE	NE	30
Iodomethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Isopropylbenzene	NE	NE	800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	800
m,p-xylene	1,000,000 [b]	NE	1,600	10,000 [b]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000
Methyl tert-butyl ether (MTBE)	20	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	20
Methylene chloride	5	5.8	480	5	0	5	960	172,839	NE	NE	NE	NE	590	NE	NE	1,600	590
Naphthalene	160 [c]	NE	160 [c]	NE	NE	NE	NE	4,938	NE	NE	NE	NE	NE	NE	NE	NE	4,938
n-Butylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
n-Propylbenzene	NE	NE	800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
o-Xylene	1,000,000 [b]	NE	1,600	10,000 [b]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000
sec-Butylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Styrene	NE	NE	1,600	100	100	100	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.5
tert-Butylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Tetrachloroethene	5	0.081	80	5	0	5	0.39	836	NE	NE	NE	NE	3.3	NE	NE	8.85	0.39
Toluene	1,000	NE	640	1,000	1,000	1,000	NE	19,400	NE	NE	NE	NE	15,000	NE	NE	200,000	15,000
trans-1,2-Dichloroethene	NE	NE	160	100	100	100	NE	32,817	NE	NE	NE	NE	10,000	NE	NE	NE	10,000
trans-1,3-Dichloropropene	NE	0.44	240	NE	NE	NE	33.9	40,721	NE	NE	NE	NE	21	NE	NE	NE	21
trans-1,4-Dichloro-2-Butene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Trichloroethene	5	0.49	2.4	5	0	5	6.7	71	NE	NE	NE	NE	30	NE	NE	81	6.7
Trichlorofluoromethane	NE	NE	2,400	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2,400
Vinyl acetate	NE	NE	8,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	8,000
Vinyl chloride	0.2	0.0608	24	2	0	2	7.69	6,648	NE	NE	NE	NE	2.4	NE	NE	525	2.4
Low-Level VOCs (ug/L) [Method 8260 SIM]																	
1,1-Dichloroethene	NE	NE	400	7	7	7	NE	23,100	NE	NE	NE	NE	7,100	NE	NE	3.24	3.24
Tetrachloroethene	5	0.081	80	5	0	5	0.39	840	NE	NE	NE	NE	3.3	NE	NE	8.85	0.39
Trichloroethene	5	0.49	2.4	5	0	5	6.7	71	NE	NE	NE	NE	30	NE	NE	81	6.7
Vinyl chloride	0.2	0.0608	24	2	0	2	7.69	6,648	NE	NE	NE	NE	2.4	NE	NE	525	2.4
SVOCs (ug/L) [Method 8270D]																	
1,2,4-Trichlorobenzene	NE	1.51	80	70	70	70	1.96	227	NE	NE	NE	NE	70	NE	NE	NE	1.96
1,2-Dichlorobenzene	NE	NE	720	600	600	600	NE	4,196	NE	NE	NE	NE	1,300	NE	NE	17,000	1,300
1,3-Dichlorobenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	960	NE	NE	2,600	960
1,4-Dichlorobenzene	NE	NE	NE	75	75	75	NE	NE	NE	NE	NE	NE	190	NE	NE	2,600	190
1-Methylnaphthalene	NE	1.51	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2.4
2,2'-Oxybis (1-chloropropane)	NE	0.625	320	NE	NE	NE	37.5	42000	NE	NE	NE	NE	NE	NE	NE	NE	NE
2,4,5-Trichlorophenol	NE	NE	800	NE	NE	NE	NE	NE	NE	NE	NE	NE	3,600	NE	NE	NE	3,600
2,4,6-Trichlorophenol	NE	4	8	NE	NE	NE	3.9	17.3	NE	NE	NE	NE	2.4	NE	NE	6.5	2.4
2,4-Dichlorophenol	NE	NE	24	NE	NE	NE	NE	191	NE	NE	NE	NE	290	NE	NE	790	191
2,4-Dimethylphenol	NE	NE	160	NE	NE	NE	NE	552	NE	NE	NE	NE	850	NE	NE	NE	552
2,4-Dinitrophenol	NE	NE	32	NE	NE	NE	NE	3,456	NE	NE	NE	NE	5,300	NE	NE	14,000	3,456
2,4-Dinitrotoluene	NE	NE	32	NE	NE	NE	NE	1,364	NE	NE	NE	NE	3.4	NE	NE	9.1	3.4
2,6-Dinitrotoluene	NE	NE	16	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16
2-Chloronaphthalene	NE	NE	640	NE	NE	NE	NE	1,026	NE	NE	NE	NE	1,600	NE	NE	NE	1,026
2-Chlorophenol	NE	NE	40	NE	NE	NE	NE	97	NE	NE	NE	NE	150	NE	NE	NE	97
2-Methylnaphthalene	NE	NE	32	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	32
2-Methylphenol	NE	NE	400	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
2-Nitroaniline	NE	NE	160	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
2-Nitrophenol	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA

Table 2
Screening Levels for Groundwater
Everett Shipyard

	Screening Levels [a]																
	Potable Groundwater						Surface Water										
	MTCA			EPA MCLs	EPA MCLGs	State MCLs	MTCA		Toxic Substances Criteria (WAC 173-201A)		National Recommended Water Quality Criteria			National Toxics Rule			Most Stringent Value [k]
	Method A	Method B - Human Health Protection					Method B - Human Health Protection		Marine Water		Saltwater		Human Health Organism Only	Saltwater		Human Health Organism Only	
		Carcinogenic	Non-carcinogenic				Carcinogenic	Non-carcinogenic	Acute	Chronic	CMC	CCC		CMC	CCC		
SVOCs (ug/L) [Method 8270D] (cont.)																	
3,3'-Dichlorobenzidine	NE	0.19	NE	NE	NE	NE	0.046	NE	NE	NE	NE	NE	0.028	NE	NE	0.077	0.028
3-Nitroaniline	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4,6-Dinitro-2-methylphenol	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	280	NE	NE	765	280
4-Bromophenyl-phenyl ether	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Chloro-3-methylphenol	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Chloroaniline	NE	0.219	32	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Chlorophenyl-phenyl ether	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Methylphenol	NE	NE	40	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Nitroaniline	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
4-Nitrophenol	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Acenaphthene	NE	NE	960	NE	NE	NE	NE	642	NE	NE	NE	NE	990	NE	NE	NE	642
Acenaphthylene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Anthracene	NE	NE	4,800	NE	NE	NE	NE	25,925	NE	NE	NE	NE	40,000	NE	NE	110,000	25,925
Benzo(a)anthracene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(a)pyrene	0.1	0.012	NE	0.2	0	0.2	0.03	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(b)fluoranthene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Benzo(k)fluoranthene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzoic acid	NE	NE	64,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	64,000
Benzyl alcohol	NE	NE	800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2,400
Bis-(2-chloroethoxy)methane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Bis-(2-chloroethyl)ether	NE	0.04	NE	NE	NE	NE	0.85	NE	NE	NE	NE	NE	0.53	NE	NE	1.4	0.53
bis(2-Ethylhexyl)phthalate	NE	6.3	320	6	0	6	3.6	400	NE	NE	NE	NE	2.2	NE	NE	5.9	2.2
Butylbenzylphthalate	NE	46.1	3,200	NE	NE	NE	8.24	1,250	NE	NE	NE	NE	1,900	NE	NE	NE	8.24
Carbazole	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.4
Chrysene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Dibenzo(a,h)anthracene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Dibenzofuran	NE	NE	16	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	32
Diethylphthalate	NE	NE	12,800	NE	NE	NE	NE	28,411	NE	NE	NE	NE	44,000	NE	NE	120,000	28,411
Dimethylphthalate	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,100,000	NE	NE	2,900,000	1,100,000
Di-n-butylphthalate	NE	NE	1,600	NE	NE	NE	NE	2,913	NE	NE	NE	NE	4,500	NE	NE	12,000	2,913
Di-n-octylphthalate	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	320
Fluoranthene	NE	NE	640	NE	NE	NE	NE	90	NE	NE	NE	NE	140	NE	NE	370	90
Fluorene	NE	NE	640	NE	NE	NE	NE	3,457	NE	NE	NE	NE	5,300	NE	NE	14,000	3,457
Hexachlorobenzene	NE	0.055	13	1	0	1	0.00047	0.24	NE	NE	NE	NE	0.00029	NE	NE	0.00077	0.00029
Hexachlorobutadiene	NE	0.56	8	NE	NE	NE	30	933	NE	NE	NE	NE	18	NE	NE	50	18
Hexachlorocyclopentadiene	NE	NE	48	50	50	50	NE	3,584	NE	NE	NE	NE	1,100	NE	NE	17,000	1,100
Hexachloroethane	NE	3.1	8	NE	NE	NE	5.3	30	NE	NE	NE	NE	3.3	NE	NE	8.9	3.3
Indeno(1,2,3-cd)pyrene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Isophorone	NE	46	1600	NE	NE	NE	1,558	118,383	NE	NE	NE	NE	960	NE	NE	600	600
Naphthalene	160 [c]	NE	160 [c]	NE	NE	NE	NE	4,938	NE	NE	NE	NE	NE	NE	NE	NE	4,938
Nitrobenzene	NE	NE	16	NE	NE	NE	NE	1,790	NE	NE	NE	NE	690	NE	NE	1,900	690
N-Nitroso-di-n-propylamine	NE	NE	NE	NE	NE	NE	0.82	NE	NE	NE	NE	NE	0.51	NE	NE	NE	0.51
N-Nitrosodiphenylamine	NE	NE	NE	NE	NE	NE	9.7	NE	NE	NE	NE	NE	6.0	NE	NE	16.0	6.0
Pentachlorophenol	NE	0.219	80	1	0	1	1.47	1,180	13.0	7.9	13	7.9	3.0	13	7.9	8.2	1.5
Phenanthrene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Phenol	NE	NE	2,400	NE	NE	NE	NE	556,000	NE	NE	NE	NE	1,700,000	NE	NE	4,600,000	556,000
Pyrene	NE	NE	480	NE	NE	NE	NE	2,593	NE	NE	NE	NE	4,000	NE	NE	11,000	2,593

Table 2
Screening Levels for Groundwater
Everett Shipyard

	Screening Levels [a]																
	Potable Groundwater						Surface Water										
	MTCA			EPA MCLs	EPA MCLGs	State MCLs	MTCA		Toxic Substances Criteria (WAC 173-201A)		National Recommended Water Quality Criteria			National Toxics Rule			Most Stringent Value [k]
	Method A	Method B - Human Health Protection					Method B - Human Health Protection		Marine Water		Saltwater		Human Health Organism Only	Saltwater		Human Health Organism Only	
		Carcinogenic	Non-carcinogenic				Carcinogenic	Non-carcinogenic	Acute	Chronic	CMC	CCC		CMC	CCC		
PAHs (ug/L) [Method 8270 SIM]																	
1-Methylnaphthalene	NE	1.51	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2.4
2-Methylnaphthalene	NE	NE	32	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	32
Acenaphthene	NE	NE	960	NE	NE	NE	NE	643	NE	NE	NE	NE	990	NE	NE	NE	643
Acenaphthylene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Anthracene	NE	NE	4,800	NE	NE	NE	NE	25,926	NE	NE	NE	NE	40,000	NE	NE	110,000	25,926
Benzo(a)anthracene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(a)pyrene	0.1	0.012	NE	0.2	0	0.2	0.03	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(b)fluoranthene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Benzo(k)fluoranthene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Chrysene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Dibenzo(a,h)anthracene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Dibenzofuran	NE	NE	16	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	32
Fluoranthene	NE	NE	640	NE	NE	NE	NE	90	NE	NE	NE	NE	140	NE	NE	370	90
Fluorene	NE	NE	640	NE	NE	NE	NE	2,456	NE	NE	NE	NE	5,300	NE	NE	14,000	2,456
Indeno(1,2,3-cd)pyrene	See Note d	See Note d	NE	NE	NE	NE	See Noted d	NE	NE	NE	NE	NE	0.018	NE	NE	0.031	0.018
Naphthalene	160 [d]	NE	160	NE	NE	NE	NE	4,938	NE	NE	NE	NE	NE	NE	NE	NE	4,938
Phenanthrene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Pyrene	NE	NE	480	NE	NE	NE	NE	2,593	NE	NE	NE	NE	4,000	NE	NE	11,000	2,593
PCBs (ug/L) [Method 8082]																	
Aroclor 1016	NE	NE	1.1	NE	NE	NE	NE	0.0058	NE	NE	NE	NE	NE	NE	0.03	NE	0.0058
Aroclor 1221	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.03	NE	0.03
Aroclor 1232	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.03	NE	0.03
Aroclor 1242	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.03	NE	0.03
Aroclor 1248	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.03	NE	0.03
Aroclor 1254	NE	NE	0.32	NE	NE	NE	NE	0.0017	NE	NE	NE	NE	NE	NE	0.03	NE	0.0017
Aroclor 1260	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.03	NE	0.03
Total PCBs	0.1	0.044	NE	0.5	0	0.5	0.000104	NE	10	0.03	NE	0.03	0.000064	NE	NE	0.00017	0.000064
TPH (mg/L) [Ecology Method NWTPH-Dx]																	
Diesel-range	0.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.5
Oil-range	0.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.5
Organotins (ug/L) [Method Psep/Krone 1988]																	
Tributyltin as TBT Ion	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.37	0.01	NE	NE	NE	NE	0.01
Dibutyl Tin Ion	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Butyl Tin Ion	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Metals (mg/L) [Method 6010B/7421/7470A]																	
Arsenic	0.005	0.0000583	0.0048	0.01	0	0.01	0.000098	0.018	0.069 [e,f]	0.036 [f,g]	0.069	0.036	0.00014	0.069	0.036	0.00014	0.000098
Antimony	NE	NE	0.0064	0.006	0.006	0.006	NE	1	NE	NE	NE	NE	0.64	NE	NE	4.3	0.64
Beryllium	NE	NE	0.032	0.004	0.004	0.004	NE	0.27	NE	NE	NE	NE	NE	NE	NE	NE	0.27
Cadmium	0.005	NE	0.016	0.005	0.005	0.005	NE	0.0405	0.042 [e,f]	0.093 [f,g]	0.04	0.0088	NE	0.042	0.0093	NE	0.0088
Calcium	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Chromium (total)	0.05	NE	NE	0.1	0.1	0.1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.05
$Chromium^{+3}$	NE	NE	24	0.1	NE	0.1	NE	243	NE	NE	NE	NE	NE	NE	NE	NE	243
$Chromium^{+6}$	NE	NE	0.048	NE	0.1	0.1	NE	0.49	1.1 [e,f,g]	0.05 [f,g]	1.1	0.05	NE	1.1	0.05	NE	0.05
Copper	NE	NE	0.64	1.3	1.3	1.3	NE	2.88	0.0048 [e,f]	0.0031 [f,g]	0.0048	0.0031	NE	0.0024	0.0024	NE	0.0024
Lead	0.015	NE	NE	0.015	0	0.015	NE	NE	0.21 [e,f]	0.0081 [f,g]	0.21	0.0081	NE	0.21	0.0081	NE	0.0081
Magnesium	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Mercury	0.002	NE	NE	0.002	0.002	0.002	NE	NE	0.0018 [e,f]	0.000025 [g]	0.0018	0.00094	0.0003	0.0018	0.000025	0.00015	0.000025
Nickel	NE	NE	0.32	NE	NE	NE	NE	1.1	0.074 [e,f]	0.0082 [f,g]	0.074	0.0082	4.6	0.074	0.0082	4.6	0.0082

Table 2
Screening Levels for Groundwater
Everett Shipyard

	Screening Levels [a]																
	Potable Groundwater						**Surface Water**										
	MTCA			**EPA MCLs**	**EPA MCLGs**	**State MCLs**	**MTCA**		**Toxic Substances Criteria (WAC 173-201A)**		**National Recommended Water Quality Criteria**			**National Toxics Rule**			**Most Stringent Value [k]**
	Method A	**Method B - Human Health Protection**					**Method B - Human Health Protection**		Marine Water		Saltwater		Human Health	Saltwater		Human Health	
		Carcinogenic	Non-carcinogenic				Carcinogenic	Non-carcinogenic	Acute	Chronic	CMC	CCC	Organism Only	CMC	CCC	Organism Only	
Metals (mg/L) Method 6010B/7421/7470A (cont.)																	
Selenium	NE	NE	0.08	0.05	0.05	0.05	NE	2.7	0.29	0.071	0.029 [e]	0.071 [e]	4.2	0.29	0.071	NE	0.071
Silver	NE	NE	0.08	0.1 [i]	NE	NE	NE	26	0.0019 [e,i]	NE	0.0019	NE	NE	0.0019	NE	NE	0.0019
Thallium	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
Zinc	NE	NE	4.8	5 [i]	NE	NE	NE	16.5	0.09 [e,f]	0.081 [f,g]	0.09	0.081	26	0.09	0.081	NE	0.081
Conventional Parameters																	
pH (standard units) [Method 150.1]	NE	NE	NE	6.5 - 8.5	NE	NE	NE	NE	6.5-9.0	6.5-9.0	NE	6.5 - 8.5	NE	NE	NE	NE	6.5 - 9.0
TDS (mg/L) [Method 160.1]	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA

Notes:
CCC - Criteria continuous concentration (chronic)
CMC - Criteria maximum concentration (acute)
MCLs - Maximum contaminant levels
MCLGs - Maximum containment level goals
mg/L - milligrams per liter
ug/L - micrograms per liter
NA - Not applicable
NE - Not established
VOCs - Volatile organic compounds
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons

[a] Screening levels are based on either standards for potable groundwater or surface water as identified in the following references:
MTCA - Model Toxics Control Act Cleanup Regulation, WAC 173-340. MTCA Method A and B values, EPA MCLs, EPA MCLGs, State MCLs, are from Ecology website CLARC tables downloaded April 2011 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
Water Quality Standards For Surface Waters of the State Of Washington, Toxic Substances Criteria, WAC 173-201A. Last update November 2006.
National Recommended Water Quality Criteria, USEPA, 2006.
National Toxics Rule, 40 CFR 131.36, USEPA 2006.
[b] The screening level shown is for total xylenes.
[c] Screening level based on total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
[d] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-780 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method A or B cleanup level for benzo(a)pyrene.
[e] The metals criteria are associated with the dissolved fraction of the water column.
[f] A 1-hour average concentration not to be exceeded more than once every three years on the average.
[g] A 4-day average concentration not to be exceeded more than once every three years on the average.
[h] An instantaneous concentration not to be exceeded at any time.
[i] National Secondary Drinking Water Regulation (secondary standard). Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water. States may choose to adopt them as enforceable standards.
[j] Value is for 1,3-dichloropropene.
[k] Most Stringent Value is the most stringent surface water screening level, or, if no surface water criteria is available, the most stringent (non-zero) potable groundwater screening level.

Table 3
Screening Levels for Sediment
Everett Shipyard

	Sediment Management Standards [a]	
	Sediment Quality Standard (SQS)	Cleanup Screening Levels (CSLs)
VOCs (ug/kg) [Method 8260B]		
1,2,4-Trichlorobenzene*	810	1800
1,2-Dichlorobenzene*	2,300	2,300
1,4-Dichlorobenzene*	3,100	9,000
SVOCs (ug/kg) [Method 8270 SIM]		
2,4-Dimethylphenol	29	29
2-Methylphenol	63	63
4-Methylphenol	670	670
Benzo(b)fluoranthene	230,000**	450,000**
Benzo(k)fluoranthene	230,000**	450,000**
Benzoic Acid	650	650
Benzyl Alcohol	57	73
Pentachlorophenol	360	690
Phenol	420	1,200
2-Methylnapthalene*	38,000	64,000
Acenaphthene*	16,000	57,000
Acenaphthylene*	66,000	66,000
Anthracene*	220,000	1,200,000
Benz[a]anthracene*	110,000	270,000
Benzo[a]pyrene*	99,000	210,000
Benzo[g,h,i]perylene*	31,000	78,000
Bis[2-ethylhexyl]phthalate*	47,000	78,000
Butyl Benzyl Phthalate*	4,900	64,000
Chrysene*	110,000	460,000
Dibenz[a,h]anthracene*	12,000	33,000
Dibenzofuran*	15,000	58,000
Diethyl Phthalate*	61,000	110,000
Dimethyl Phthalate*	53,000	53,000
Di-n-butyl Phthalate*	220,000	1,700,000
Di-n-octyl Phthalate*	58,000	4,500,000
Fluoranthene*	160,000	1,200,000
Fluorene*	23,000	79,000
Indeno[1,2,3-cd]pyrene*	34,000	88,000
Napthalene*	99,000	170,000
N-nitrosodiphenylamine*	11,000	11,000
Phenanthrene*	100,000	480,000
Pyrene*	1,000,000	1,400,000
Total LPAH	370,000	780,000
Total HPAH	960,000	5,300,000
Total Benzofluoranthenes	230,000	450,000
Pesticides (ug/kg) [Method 8081A]		
Hexachlorobenzene*	380	2,300
Hexachlorobutadiene*	3,900	6,200
PCBs (ug/kg) [Method 8082]		
Aroclor 1016	--	--
Aroclor 1221	--	--
Aroclor 1232	--	--
Aroclor 1242	--	--
Aroclor 1248	--	--
Aroclor 1254	--	--
Aroclor 1260	--	--
Total PCBs*	12,000	65,000

Table 3
Screening Levels for Sediment
Everett Shipyard

	Sediment Management Standards [a]	
	Sediment Quality Standard (SQS)	Cleanup Screening Levels (CSLs)
Organotin (µg/L) (Pore Water) [Krone]		
Tetrabutyl Tin	NE	NE
Tributyl Tin Chloride	NE	NE
Dibutyl Tin Dichloride	NE	NE
Butyl Tin Trichloride	NE	NE
TBT as Tin ion	0.05 [b]	0.15 [c]
Organotin (µg/kg) (Bulk) [Krone]		
Tetrabutyl Tin	NE	NE
Tributyl Tin Chloride	NE	NE
Dibutyl Tin Dichloride	NE	NE
Butyl Tin Trichloride	NE	NE
Tributyltin as TBT ion	NE	73 [d]
Metals (mg/kg) [Method 6010/7471]		
Arsenic	57	93
Cadmium	5.1	6.7
Chromium	260	270
Copper	390	390
Lead	450	530
Mercury	0.41	0.59
Silver	6.1	6.1
Zinc	410	960
Ammonia (mg-N/kg) [Method 350.1]		
Ammonia	NE	NE
Total Sulfides (mg/kg) [Method PSEP]		
Total Sulfides	NE	NE
Acid Volatile Sulfides	NE	NE
Total Solids (%)		
Total Solids **[Method 160.3]**	NE	NE
Total Volatile Solids (mg/kg) **[Method 160.4]**	NE	NE
TOC (%) [Method PSEP/Plumb]		
TOC	NE	NE

Notes:
NE - Not established
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
TOC - Total organic carbon
Total LPAH = The sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
Total HPAH = The sum of detected fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.
Total benzofluoranthenes= The sum of the b, j, and k isomers.
VOCs - Volatile organic compounds
Laboratory MDLs, RLs, and control limits provided by Analytical Resources, Inc.
* The listed SQS value represents a concentration in parts per billion (ppb) 'normalized' on a TOC basis.
** The listed SQS value represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.
[a] Sediment Sampling and Analysis Plan Appendix; Washington State Department of Ecology, Publication 03-09-043, Revised February 2008 (WAC 173-204).
[b] Approximate no affects level (SQS equivalent)
[c] Puget Sound Drilling and Dredging Act (PSDDA) open water disposal screening level criteria.
[d] Preliminary criteria based on bulk equivalent of PSDDA open water disposal screening level criteria for porewater TBT.

APPENDIX D

GLOBAL GEOPHYSICS REPORT

Global Geophysics
16651 White Mountain Road SE
Monroe, WA 98272
Tel: 425-890-4321
Fax: 360-805-0259

July 28, 2010 Our ref: 100-0728.000

URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101

ATTENTION: Mr. David Raubvogel

RE: REPORT FOR UST LOCATE AT 1402 WEST MARINE VIEW DRIVE, EVERETT, WASHINGTON

This letter report presents the results of the geophysical survey performed by Global Geophysics on July 28th, 2010 at 1402 West Marine View Drive, Everett, WA. The objective of the geophysical test was to attempt to locate underground storage tanks.

METHODOLOGY, INSTRUMENTATION AND FIELD PROCEDURES

Magnetometer and ground penetrating radar were used for this project. The standard procedures of these surveys are attached in the appendix.

Magnetics

This magnetometer is used to measure variations in the magnetic field of the Earth, including local distortions or anomalies of the field caused by ferrous objects or minerals. In general, the magnitude of the magnetometer response is proportional to the mass of the ferrous object. A single drum can be detected to a depth of approximately 15 to 20 feet, and a 4-inch diameter steel pipeline can be detected to a depth of approximately 10 feet. Non-ferrous metals, such as copper and aluminum cannot be located with a magnetometer.

A Geometrics Cesium magnetometer was used to collect magnetic data along the traverses 5 ft apart.

Ground Penetrating Radar

The GPR method uses electromagnetic pulses, emitted at regular intervals by an antenna to map subsurface features. The electromagnetic pulses are reflected where changes in electrical properties of materials occur such as changes in lithology or where underground utilities are present. The reflected electromagnetic energy is received by an antenna, converted into an electrical signal, and recorded on the GPR unit. The data is recorded and viewed in real time on a graphical display that depicts a continuous profile or cross-section image of the subsurface directly beneath the path of the antenna.

The depth of penetration of the GPR signal varies according to antenna frequency and the conductivity of the subsurface material. The depth of subsurface penetration with GPR decreases with an increase in the frequency of the antenna and an increase in soil conductivity. Low frequency antennas (50 to 500 MHz) provide the best compromise between obtaining good subsurface penetration and resolution.

The data at this site were collected using Geophysical Survey Systems, Inc. (GSSI) SIR 2000 GPR system with antennas having center frequency of 200 MHz and 400 MHz. The data were digitally recorded for post processing.

RESULTS

The magnetic data is contoured and presented in Figure 1. Two strongest magnetic anomalies are identified as potential underground storage tanks (USTs). A bigger area inside the dashed cyan line with higher than background magnetic intensity is interpreted as possible concrete support with metallic mesh (no rebar was detected with GPR).

GPR survey was conducted on the magnetic anomalies. The depth to the top of a reflector is within 2 ft. Three GPR profiles are shown in Figure 2.

LIMITATIONS

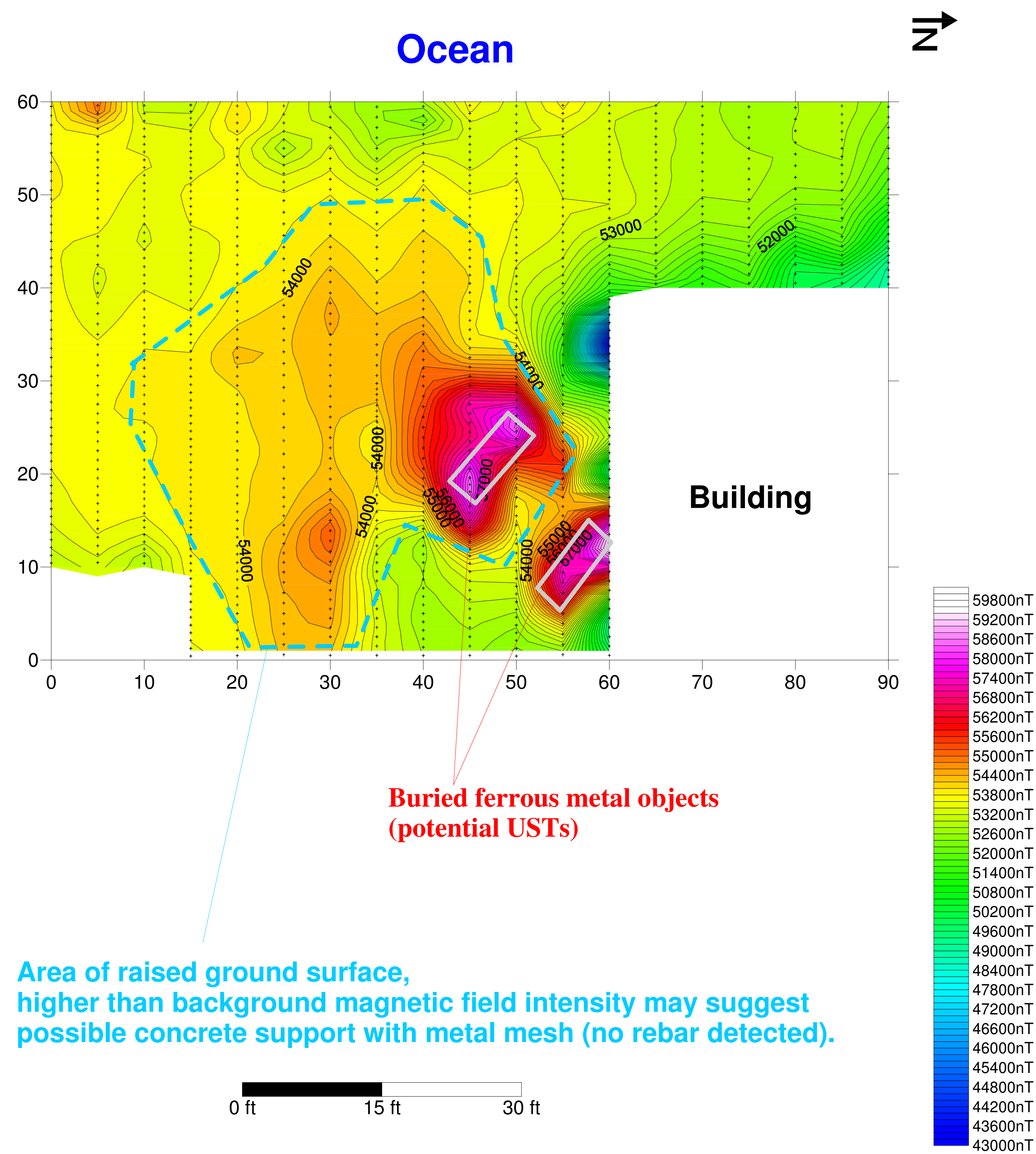
Global Geophysics's services are conducted in a manner consistent with the level of care and skill ordinarily exercised by other members of the geophysical community currently practicing under similar conditions subject to the time limits and financial and physical constraints applicable to the services. Magnetics and ground penetrating radar (GPR) are remote sensing geophysical methods that may not detect all subsurface objects. Furthermore, it is possible that geophysical anomalies that are interpreted to be USTs may upon intrusive sampling prove to be misinterpreted.

If you have any questions or require additional information, please contact us at 425-890-4321.

Sincerely,

Global Geophysics

John Liu, Ph.D.
Principal Geophysicist



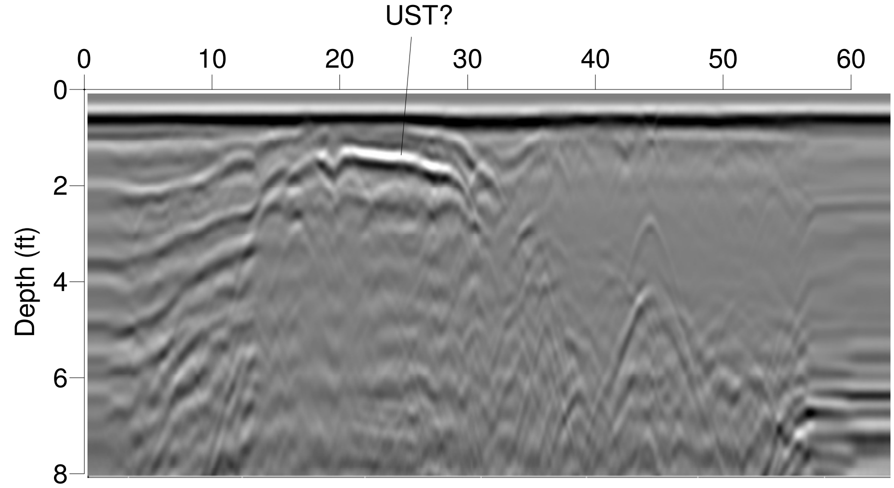
Note: Magnetic field intensity SI unit is nano Tesla

PROJECT	URS CORPORATION GEOPHYSICAL SURVEYS AT 1402 W MARINE VIEW DR. EVERETT, WA
TITLE	MAGNETIC CONTOUR PLAN

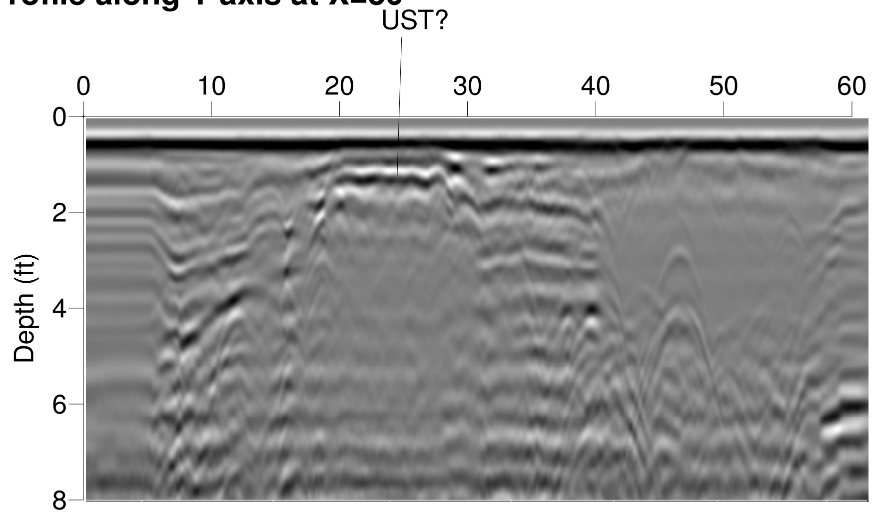
Global Geophysics
16651 White Mountain Road SE
Monroe, WA, 98272
Tel: 425-890-4321

PROJECT No.	100-0728.000	FILE No.	
DESIGN	--	SCALE AS SHOWN	REV.
CADD	JL	FIGURE 1	
CHECK	--		
REVIEW	--		

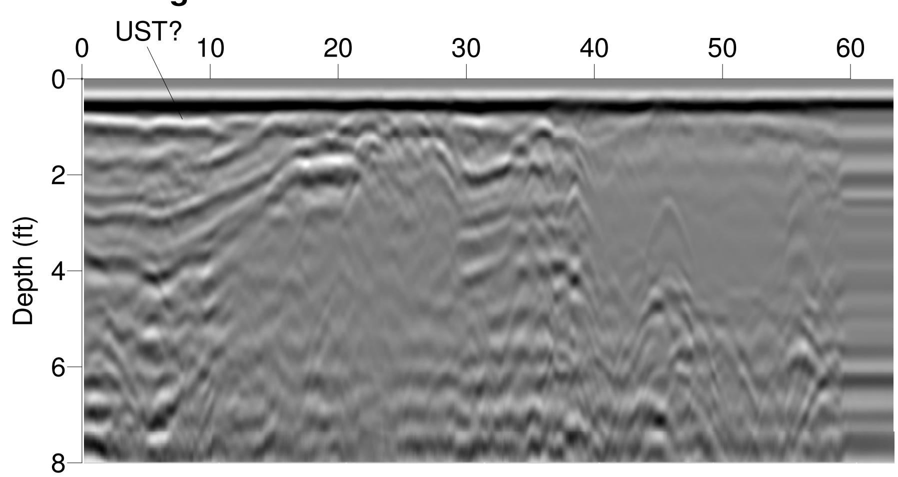
GPR Profile along Y axis at X=45



GPR Profile along Y axis at X=50



GPR Profile along Y axis at X=55



PROJECT
URS CORPORATION
GEOPHYSICAL SURVEYS AT 1402 W MARINE VIEW DR.
EVERETT, WA

TITLE
EXAMPLE GPR PROFILES

Global Geophysics	PROJECT No.	100-0728.000	FILE No.	
16651 White Mountain Road SE	DESIGN	--	SCALE AS SHOWN	REV.
Monroe, WA, 98272	CADD	JL	**FIGURE 2**	
Tel: 425-890-4321	CHECK	--		
	REVIEW	--		

APPENDIX E

GROUNDWATER SAMPLE COLLECTION FORMS

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Windy, light rain, 40F
Date:	1/6/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-1			Screen Interval:	4.5-14.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	12.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	3.08	Elevation:	9.78	One Purge Volume:	1.83
Depth to Bottom:	14.5	Feet of Water:	11.42	Final Purge Volume:	1.5 gal
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	-
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-1-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.96	0.523	23.2	1.42	9.6	NM	1709	3.08	0.3
1.5	6.74	0.601	27.4	0	7.1	NM	1714	-	0.3
3	6.78	0.638	23.7	0	7.4	NM	1719	-	0.3
4.5	6.89	0.679	21.6	0	9	NM	1724	-	0.3
6	6.92	0.671	20.0	0	9.3	NM	1729	3.43	0.3

Comments

Clean, no odor or sediment. Sample at 1730

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	A Thatcher

Gauging and Purging Data

Station Number:	MW-1			Screen Interval:	4.5-14.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	12.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	3.58	Elevation:	9.26	One Purge Volume:	1.7792
Depth to Bottom:	14.7	Feet of Water:	11.12	Final Purge Volume:	1.5
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-1-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.97	57.3	7.6	2.95	8.8	-89	1418	3.58	0.4
1.2	6.94	56.9	14.8	2.81	8.9	91	1421	4.26	0.4
2	6.92	57.8	9.0	2.76	8.9	92	1423	4.32	0.4
2.8	6.91	58.8	46.2	2.73	8.9	94	1425	4.37	0.4
3.6	6.88	61.9	22.9	2.72	9	96	1427	4.44	0.4
4	6.86	62.2	34.5	2.7	9	98	1428	4.48	0.4
4.4	6.85	62.2	16.7	2.69	9	99	1429	4.49	0.4
4.8	6.84	62.7	13.3	2.69	9	100	1430	4.49	0.4
5.2	6.84	63.1	14.1	2.68	9.1	101	1431	4.51	0.4
6	6.85	63.8	23.2	2.68	9.1	102	1433	4.54	0.4
	6.82	64.1	20.0	2.68	9.1	103			

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	40F, windy, light rain
Date:	1/6/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-2			Screen Interval:	4.75-14.75
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	2.92	Elevation:	10.92	One Purge Volume:	1.8736
Depth to Bottom:	14.63	Feet of Water:	11.71	Final Purge Volume:	1.5 gal
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-2-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1720	2.92	0.3
0.6	6.68	24	7.8	0	11.1	-37	1722	3.25	0.3
1.5	6.45	22	8.3	0	11.1	-15	1725	-	0.3
2.4	6.46	22	9.7	0	11.1	-48	1728	3.41	0.3
3.6	6.46	21	13.6	0	11.1	-37	1732	3.45	0.3
5.4	6.47	21	17.0	0	11.1	-64	1738	3.5	0.3
6	6.5	21	20.4	0	11.1	-70	1740	-	0.3
							1840	2.95	

Comments

Collect sample at 1750

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-2			Screen Interval:	4.75-14.75
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	3.7	Elevation:	10.14	One Purge Volume:	1.7504
Depth to Bottom:	14.64	Feet of Water:	10.94	Final Purge Volume:	1.5
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-2-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1357	3.78	0.2
0.2	6.89	39.3	7.9	1.94	9.2	-80	1358	3.91	0.25
1	6.70	36.0	5.2	0	9.4	-93	1401	4.11	0.3
1.9	6.68	33.1	5.1	0	9.5	-97	1404	4.29	0.3
2.8	6.67	31.4	5.1	0	9.5	-100	1407	4.35	0.3
3.7	6.67	30.2	5.0	0	9.5	-103	1410	4.43	0.3
4.6	6.69	28.8	4.6	0	9.5	-105	1413	4.45	0.3
6.1	6.70	28.4	3.7	0	9.5	-108	1418	4.47	0.3

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	70 F, partly cloudy
Date:	7/9/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-2			Screen Interval:	4.75-14.75
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.1	Elevation:	8.74	One Purge Volume:	1.52
Depth to Bottom:	14.6	Feet of Water:	9.5	Final Purge Volume:	1.7
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 7/9/09
ORP:	Horiba U-22 7/9/09
Conductivity:	Horiba U-22 7/9/09
DO Meter:	Horiba U-22 7/9/09
Turbidity:	Horiba U-22 7/9/09
Temperature:	Horiba U-22 7/9/09
Other:	

Sampling Data

Sample Name:	MW-2-070909
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.66	29.3	2.2	2.42	15.5	9	1237	5.1	0.5
1.5	6.44	27.8	11.2	0.13	15.2	5	1240	5.31	0.5
3	6.21	26.9	15.4	0	15.3	8	1243	5.45	0.4
4.2	6.16	26.7	-	2.37	15.3	7	1246	5.47	0.4
5.4	6.08	26.7	-	0.11	15.4	5	1249	5.5	0.4
6.6	6.05	26.7	-	0	15.1	3	1252	5.51	0.4
							1302	5.55	

Comments

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GROUNDWATER SAMPLING DATA SHEET

Project Information

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Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	45 - 55 F, cloudy
Date:	10/13/2009	Samplers:	J Wellmeyer & E Lillywhite

Gauging and Purging Data

Station Number:	MW-2			Screen Interval:	4.75-14.75
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.84	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.21	Elevation:	8.63	One Purge Volume:	1.512
Depth to Bottom:	14.66	Feet of Water:	9.45	Final Purge Volume:	1.5 gal
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22, 10/13/09
ORP:	Horiba U-22, 10/13/09
Conductivity:	Horiba U-22, 10/13/09
DO Meter:	Horiba U-22, 10/13/09
Turbidity:	Horiba U-22, 10/13/09
Temperature:	Horiba U-22, 10/13/09
Other:	

Sampling Data

Sample Name:	MW-2-101309
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	13.5
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	5.52	31.3	12.2	5.02	14.8	74	725	5.41	0.33
1	5.53	31.0	15	4.25	15.1	58	728	5.42	0.33
2	5.62	30.5	14.4	3.86	15.3	35	731	5.44	0.33
3	5.70	30.3	15.2	3.87	15.4	22	734	5.44	0.33
4	5.72	30.2	15.9	3.93	15.4	21	737	5.45	0.33
5	5.73	30.3	14.6	3.96	15.3	19	740	5.47	0.33
6	5.72	30.2	15.1	3.99	15.4	18	743	5.48	0.33

Comments

Sample collected @ 745

WELL DEVELOPMENT DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	rain, wind, 40F
Date:	12/12/2008	Samplers:	D Lewis

Gauging and Purging Data

Well Number:	MW-4			Screen Interval:	13-Mar
Reference Point:	TOC	Elevation	15.09	Well Diameter:	2" Annulus Diameter:
Depth to Water:	6.57	Elevation	8.52	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Depth to Bottom:	12.98	Feet of Water:	6.41	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Purge Method:	whale pump			One Purge Volume:	1.0256
Water Disposal/Qty:	drum (50 gal)			Final Purge Volume:	50

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.61	0.16	>999	4.92	13	-13	1229
20	5.33	0.134	280	2.47	13.3	-62	1234
30	5.2	0.12	212	0.11	13.4	-87	1240
40	5.21	0.12	301	0.92	13.6	-88	1244
50	5.18	0.117	109	0	13.6	-94	1249

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Windy, Rainy 40F
Date:	1/6/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-4			Screen Interval:	3-13
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.09	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	6.05	Elevation:	9.04	One Purge Volume:	1.08
Depth to Bottom:	12.8	Feet of Water:	6.75	Final Purge Volume:	1.25
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	-
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-4-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	7.06	0.426	50.8	1.04	11.8	NM	1840	6.05	0.4
1.6	6.64	0.799	60	0	10	NM	1844	-	0.4
3.2	6.59	0.812	63.2	0	9.3	NM	1848	-	0.4
4	6.58	0.837	68.6	0	8.3	NM	1850	-	0.4
4.8	6.58	0.876	67.7	0	7.1	NM	1852	-	0.4
							1923	6.11	

Comments

Clear, no odor or sediment. Collect sample at 1854

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 45F
Date:	4/1/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-4			Screen Interval:	3-13
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.09	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	6.7	Elevation:	8.39	One Purge Volume:	0.9824
Depth to Bottom:	12.84	Feet of Water:	6.14	Final Purge Volume:	2.5
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	disharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-4-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10.24
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	5.69	84.8	26.4	3.19	9.7	12	1440	6.85	1
3	5.99	86.9	45.0	1.67	9.9	-27	1443	6.85	0.55
4.65	6.07	86.6	35.5	1.59	9.9	-40	1446	6.85	0.6
6.45	6.10	86.5	66.9	1.57	10.0	-45	1449	6.90	0.6
8.25	6.10	86.5	42.0	1.56	10.0	-49	1452	6.95	0.6
10	6.11	86.5	34.3	1.55	10.1	-51	1455	7.01	0.6

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	70 F, partly cloudy
Date:	7/9/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-4			Screen Interval:	3-13
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.09	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	7.24	Elevation:	7.85	One Purge Volume:	0.8544
Depth to Bottom:	12.58	Feet of Water:	5.34	Final Purge Volume:	1.5
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 7/9/09
ORP:	Horiba U-22 7/9/09
Conductivity:	Horiba U-22 7/9/09
DO Meter:	Horiba U-22 7/9/09
Turbidity:	Horiba U-22 7/9/09
Temperature:	Horiba U-22 7/9/09
Other:	

Sampling Data

Sample Name:	MW-4-070909
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.69	84.0	0	1.04	16.2	-57	1145	7.24	0.5
1.5	6.61	84.7	-	0.03	15.6	-55	1148	7.34	0.5
3	6.55	84.8	-	0	15.4	-98	1151	7.35	0.5
4.5	6.56	84.3	-	0	15.3	-105	1154	7.36	0.5
6	6.54	84.5	-	0	15.3	-116	1157	7.36	0.5
							1208	7.27	

Comments

turbidity = - means output was blinking, no valid value available

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	45-55 F, cloudy
Date:	10/13/2009	Samplers:	J Wellmeyer & E Lillywhite

Gauging and Purging Data

Station Number:	MW-4			Screen Interval:	3-13
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.09	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	7.58	Elevation:	7.51	One Purge Volume:	0.856
Depth to Bottom:	12.93	Feet of Water:	5.35	Final Purge Volume:	1.75
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 10/13/09
ORP:	Horiba U-22 10/13/09
Conductivity:	Horiba U-22 10/13/09
DO Meter:	Horiba U-22 10/13/09
Turbidity:	Horiba U-22 10/13/09
Temperature:	Horiba U-22 10/13/09
Other:	

Sampling Data

Sample Name:	MW-4-101309
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	x
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.47	86.6	5.6	5.40	15.7	-69	815	7.65	0.33
1	6.44	86.8	6.6	3.44	15.9	-86	818	7.66	0.33
2	6.46	86.6	7.0	3.29	15.9	-97	821	7.66	0.33
3	6.59	86.6	5.7	3.38	15.9	-110	824	7.66	0.33
4	6.63	86.6	5.8	3.31	15.9	-117	827	7.66	0.33
5	6.68	86.7	6.4	3.29	15.9	-118	830	7.66	0.33
6	6.66	86.7	5.9	3.33	16.0	-120	833	7.66	0.33
7	6.67	86.8	5.8	3.25	16.0	-121	836	7.66	0.33

Comments

Collect sample @ 840

WELL DEVELOPMENT DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	rain, wind, 40F
Date:	12/12/2008	Samplers:	D Lewis

Gauging and Purging Data

Well Number:	MW-5			Screen Interval:	2.5-12.5
Reference Point:	TOC	Elevation	14.81	Well Diameter:	2" Annulus Diameter:
Depth to Water:	6.12	Elevation	8.69	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Depth to Bottom:	12.5	Feet of Water:	6.38	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Purge Method:	whale pump			One Purge Volume:	1.0208
Water Disposal/Qty:	Drum (55 gal)			Final Purge Volume:	55

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:	Horiba U-22	12/12/2008	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.69	68.7	>999	5.07	12.7	3	1305
20	5.58	74.2	415	2.79	13.1	-12	1310
30	5.65	73.2	614	1.07	13	-35	1315
40	5.65	73	346	2.45	13.1	-41	1320
50	5.65	74.2	371	0	12.3	-47	1325
55	5.6	72.7	219	0	13.2	-50	1330

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	40F, windy, light rain
Date:	1/6/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-5			Screen Interval:	2.5-12.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	14.81	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.85	Elevation:	8.96	One Purge Volume:	1.024
Depth to Bottom:	12.25	Feet of Water:	6.4	Final Purge Volume:	1
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-5-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1853	5.85	0.3
0.3	6.97	47	23	3.02	9.7	78	1854	5.95	0.3
1.2	6.74	48	10.9	0.6	9.7	90	1857	5.96	0.3
3	6.66	48	4	0.36	9.7	97	1903	5.98	0.3
4.2	6.82	48	2	0.84	9.8	95	1911	5.98	0.3

Comments

Sampled at 1925

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	A Thatcher

Gauging and Purging Data

Station Number:	MW-5			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	14.81	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	6.65	Elevation:	8.16	One Purge Volume:	0.8736
Depth to Bottom:	12.11	Feet of Water:	5.46	Final Purge Volume:	2
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-5-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	8'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.82	56.4	13.8	4.48	9.1	27	1532	6.65	0.5
1	6.75	56.1	5.2	2.9	9.1	26	1534	6.7	0.64
2.3	6.72	56.1	6.4	2.55	9.1	29	1536	6.7	0.64
4.2	6.67	55.5	4.6	2.69	9.2	33	1539	6.8	0.64
6.1	6.64	55.1	5.3	2.41	9.1	38	1542	6.8	0.64
8	6.62	55	5.4	2.31	9.1	39	1545	6.78	0.64

Comments

WELL DEVELOPMENT DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, wind, 40F
Date:	12/12/2008	Samplers:	D Lewis

Gauging and Purging Data

Well Number:	MW-6			Screen Interval:	2.5-12.5'
Reference Point:	TOC	Elevation	13.31	Well Diameter:	2" Annulus Diameter:
Depth to Water:	4.25	Elevation	9.06	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Depth to Bottom:	12.37	Feet of Water:	8.12	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Purge Method:	whale pump			One Purge Volume:	1.2992
Water Disposal/Qty:	drum / 55 gal			Final Purge Volume:	55

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.25	0.116	>999	5.24	13.7	24	1341
5	5.04	0.107	>999	4.27	14.1	-1	1346
10	5.00	0.108	>999	4.43	14	-9	1351
15	4.96	0.1	>999	3.91	14.2	-12	1356
20	4.39	0.111	776	2.78	14.3	-17	1403
25	4.91	0.11	697	3.54	14.2	-22	1408
30	4.87	0.108	675	3.16	14.2	-17	1413
35	4.87	0.12	428	5.43	14.3	-20	1418
40	4.82	0.119	373	2.2	14.3	-18	1423
45	4.89	0.116	417	5.21	14	-18	1428
50	4.81	0.121	507	3.48	14.2	-21	1433
55	4.81	0.112	469	3.21	14.2	-22	1438

Comments

Pump keeps starting & stopping

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	
Date:	1/6/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-6			Screen Interval:	2.5-12.5'
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.31	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4.31	Elevation:	9	One Purge Volume:	1.3104
Depth to Bottom:	12.5	Feet of Water:	8.19	Final Purge Volume:	?
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-6-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
-	6.5	86	9	7.09	10.6	342	1928	4.31	-
-	6.61	84.6	11.2	1.79	10.4	319	1931	-	-
-	6.72	81.2	11.4	1.09	10.22	301	1934	-	-
-	6.72	81.1	36	0.81	10.36	281	1937	-	-
-	6.72	82.1	23.4	0.79	10.57	279	1940	-	-
-	6.72	82	24.6	0.78	10.58	276	1943	-	-
-	6.72	81.7	24	0.77	10.58	275	1946	3.61	-

Comments

Sampled at 1950

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-6			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.31	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4.94	Elevation:	8.37	One Purge Volume:	1.1776
Depth to Bottom:	12.3	Feet of Water:	7.36	Final Purge Volume:	1.7
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-6-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1455	5.14	
0	6.8	86.7	0.1	5.51	9.8	-12	1456	5.28	0.2
0.6	6.73	85.3	2.2	0	9.8	-52	1459	5.57	0.3
1.8	6.72	83.5	2.1	0	9.7	-64	1503	5.76	0.3
3	6.72	84	2	0	9.8	-71	1506	5.84	0.3
3.9	6.75	84.1	2	0	9.9	-76	1509	5.92	0.3
5.1	6.78	84.4	3.1	0	10	-81	1513	5.96	0.3
6	6.79	84.5	2.3	0	10	-82	1516	5.98	0.3
6.9	6.8	84.4	4.2	0	10.1	-85	1519	6	0.3

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	45-55 F, cloudy
Date:	10/13/2009	Samplers:	J Wellmeyer & E Lillywhite

Gauging and Purging Data

Station Number:	MW-6			Screen Interval:	2.5-12.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	13.31	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.93	Elevation:	7.38	One Purge Volume:	1.048
Depth to Bottom:	12.48	Feet of Water:	6.55	Final Purge Volume:	1.25
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 10/13/09
ORP:	Horiba U-22 10/13/09
Conductivity:	Horiba U-22 10/13/09
DO Meter:	Horiba U-22 10/13/09
Turbidity:	Horiba U-22 10/13/09
Temperature:	Horiba U-22 10/13/09
Other:	

Sampling Data

Sample Name:	MW-6-101309
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	11.5
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	x
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (S/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							720		0.3
1	6.4	0.092	NA	7.37	16.1	139	722	6.41	0.3
2	6.54	0.092	188	2.53	16.2	68	725	6.56	0.3
3	6.59	0.092	199	1.7	16.3	69	728	6.72	0.3
4	6.58	0.087	387	4.71	16.1	71	731	6.74	0.3
5	6.6	0.087	209	1.48	16.1	70	734	6.74	0.3

Comments

Collect sample @ 736; Collect field duplicate MW-11-101309 @752 Rotten egg odor, gray color, particulates present, no sheen @ 729
emptied flow through cell to try and clear out some particulates, disrupts continuity of DO & turbidity measurements

WELL DEVELOPMENT DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 35F
Date:	12/12/2008	Samplers:	D Lewis

Gauging and Purging Data

Well Number:	MW-7			Screen Interval:	2.5-12.5		
Reference Point:	TOC	Elevation	15.15	Well Diameter:	2"	Annulus Diameter:	
Depth to Water:	5.12	Elevation	10.03	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)		0.16	
Depth to Bottom:	13	Feet of Water:	7.88	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)			
Purge Method:	whale pump			One Purge Volume:	1.2608		
Water Disposal/Qty:	drum / 55 gal			Final Purge Volume:	55		

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.86	56.8	>999	9.05	11.4	39	817
	4.65	67.8	>999	4.58	11.6	43	828
20	4.66	66.3	763	4.34	11.9	24	832
30	4.79	67.4	95.6	2.91	11.9	1	837
35	4.84	67	582	2.81	12	-3	841
40	4.88	72.2	677	2.82	11.9	-9	850
45	4.95	69.9	106	3.08	12	-15	853
50	4.96	70.4	27.6	3.26	12	-20	859
55	4.97	69.9	37	2.93	12	-24	903

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	
Date:	1/6/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-7			Screen Interval:	2.5-12.5'
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.15	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	3.88	Elevation:	11.27	One Purge Volume:	1.3792
Depth to Bottom:	12.5	Feet of Water:	8.62	Final Purge Volume:	?
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-7-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	11
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.8	29	78.7	7.45	8.47	275	1710	3.97	-
-	6.29	28	55.7	5.09	8.39	287	1713	3.98	-
-	6.07	28	47.8	4.12	8.15	294	1716	3.99	-
-	6.05	29	42.5	3.99	8.14	292	1719	4	-
-	6.05	29	42	3.87	8.2	290	1722	4.01	-
-	6.05	29	42	3.85	8.2	290	1725	4.03	-
-	6.04	29	41.5	3.8	8.2	291	1729	4.05	-

Comments

Sample at 1735. Collect Field Duplicate MW-010609 at 1810

GROUNDWATER SAMPLING DATA SHEET

URS

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 50F
Date:	4/1/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-7			Screen Interval:	2.5-12.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.15	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.2	Elevation:	9.95	One Purge Volume:	1.24
Depth to Bottom:	12.95	Feet of Water:	7.75	Final Purge Volume:	2.75
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-7-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10.24
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.48	29.2	57.6	5.72	8.0	188	1332	-	0.4
1.2	6.00	29.2	34.9	5.28	8.1	180	1335	5.59	1
4.2	5.67	28.5	28.4	3.02	8.2	170	1338	5.62	0.55
5.9	5.63	28.3	13.4	4.01	8.3	165	1341	5.66	0.55
7.6	5.57	28.4	10.0	3.24	8.3	149	1344	5.7	0.55
9.3	5.55	28.4	7.1	3.17	8.3	144	1347	5.74	0.55
11	5.53	28.4	4.8	3.13	8.3	137	1350	5.79	0.55

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	70 F, partly cloudy
Date:	7/9/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-7			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.15	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	6.36	Elevation:	8.79	One Purge Volume:	1.0528
Depth to Bottom:	12.94	Feet of Water:	6.58	Final Purge Volume:	1.9
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 7/9/09
ORP:	Horiba U-22 7/9/09
Conductivity:	Horiba U-22 7/9/09
DO Meter:	Horiba U-22 7/9/09
Turbidity:	Horiba U-22 7/9/09
Temperature:	Horiba U-22 7/9/09
Other:	

Sampling Data

Sample Name:	MW-7-070909
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.44	38	42.1	2.95	11.9	50	1049	6.36	0.5
1.5	5.93	35.3	58.1	0.06	11.6	61	1052	6.58	0.5
3	5.84	34.4	33.1	1.17	11.7	69	1055	6.64	0.5
4.5	5.86	34.1	25.7	2	11.8	71	1058	6.64	0.4
6	5.85	32.5	1.8	0	11.7	71	1101	6.66	0.4
7.5	5.86	32.2	2.3	0	11.7	70	1104	6.66	0.4
							1123	6.61	0

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	45-55 F, cloudy
Date:	10/13/2009	Samplers:	J Wellmeyer & E Lillywhite

Gauging and Purging Data

Station Number:	MW-7			Screen Interval:	2.5 - 12.5
Station Type:	Monitoring Well			Well Diameter:	2" Annulus Dia.:
Well Condition:	Good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.15	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	6.69	Elevation:	8.46	One Purge Volume:	1.0224
Depth to Bottom:	13.08	Feet of Water:	6.39	Final Purge Volume:	1.4
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 10/13/09
ORP:	Horiba U-22 10/13/09
Conductivity:	Horiba U-22 10/13/09
DO Meter:	Horiba U-22 10/13/09
Turbidity:	Horiba U-22 10/13/09
Temperature:	Horiba U-22 10/13/09
Other:	

Sampling Data

Sample Name:	MW-7-101309
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							819	6.69	0.375
1.125	6.63	35.6	21.4	6.42	13.4	11	822	6.97	0.375
2.3	6.41	35.4	13.3	2.21	13.6	-27	825	7.03	0.375
3.4	6.39	35.5	8.9	1.42	13.7	-39	828	7.07	0.375
4.5	6.42	35.7	7.9	0.97	13.8	-43	831	7.10	0.375
5.6	6.4	35.3	9.4	0.84	13.8	-59	834	7.12	0.375

Comments

Collect sample @ 835 Clear, no odor, no sheen

WELL DEVELOPMENT DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, wind 35F
Date:	12/12/2008	Samplers:	D Lewis

Gauging and Purging Data

Well Number:	MW-8			Screen Interval:	2.5-12.5		
Reference Point:	TOC	Elevation	14.88	Well Diameter:	2"	Annulus Diameter:	
Depth to Water:	4.75	Elevation	10.13	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)			0.16
Depth to Bottom:	13	Feet of Water:	8.25	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)			
Purge Method:	whale pump			One Purge Volume:	1.32		
Water Disposal/Qty:	Drum / 35 gal			Final Purge Volume:	35		

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.17	0.141	>999	4.31	11.7	54	918
10	5.27	0.14	671	5.55	11.9	1	929
	5.18	0.147	>999	3.9	12.2	-15	935
20	5.22	0.143	560	2.54	12.2	-14	943
	5.22	0.149	334	3.39	12.3	-28	950
	5.18	0.146	110	2.87	12.2	-35	958
30	5.32	0.145	74	4.90	12	-37	1004
35	5.29	0.149	108	5.07	12.1	-32	1013

Comments

pump starting/stopping

GROUNDWATER SAMPLING DATA SHEET

Project Information

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Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Cloudy, 50F
Date:	1/6/2009	Samplers:	J Wellmeyer

Gauging and Purging Data

Station Number:	MW-8			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	14.88	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4.17	Elevation:	10.71	One Purge Volume:	1.3328
Depth to Bottom:	12.5	Feet of Water:	8.33	Final Purge Volume:	2.6
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-8-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.36	0.121	11.6	12.55	8	NM	1506	4.17'	0.3
3	6.77	0.139	6.8	0	3.9	NM	1516	-	0.3
6	6.86	0.125	27.4	NM	6.9	NM	1526	-	0.3
7.2	6.89	0.131	23.9	NM	6.7	NM	1531	-	0.3
8.7	6.91	0.132	22	NM	6	NM	1536	-	0.3
10.2	6.91	0.133	23.1	NM	5.7	NM	1541	4.51'	0.3

Comments

Clear, no odor, no sediment. 1516 DO meter stopped functioning property. Sample at 1545

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-8			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	14.88	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4.94	Elevation:	9.94	One Purge Volume:	1.2384
Depth to Bottom:	12.68	Feet of Water:	7.74	Final Purge Volume:	1.25
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-8-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1204	4.94	-
0.45	6.97	0.149	33.8	4.58	7.7	171	1207	5.06	0.15
1	6.86	0.138	22.5	0	7.9	103	1211	5.09	0.15
2	6.9	0.132	13.7	0	7.9	50	1218	5.11	0.15
3	6.91	0.13	11.5	0	7.8	28	1222	5.12	0.15
3.5	6.92	0.13	23.6	0	7.8	15	1225	5.12	0.15
4	6.93	0.129	15.8	0	7.9	-4	1228	5.13	0.15
4.5	6.94	0.129	15.6	0	8.1	-17	1231	5.13	0.15
5	6.94	0.129	14.3	0	8.1	-20	1234	5.14	0.15

Comments

WELL DEVELOPMENT DATA SHEET

Project Information

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Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	cloudy
Date:	12/9/2008	Samplers:	B Gray, J McCullough

Gauging and Purging Data

Well Number:	MW-9			Screen Interval:	2.9-12.9
Reference Point:	TOC	Elevation	15.54	Well Diameter:	2" Annulus Diameter:
Depth to Water:	6.25	Elevation	9.29	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Depth to Bottom:	13	Feet of Water:	6.75	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Purge Method:	whale pump			One Purge Volume:	1.08
Water Disposal/Qty:	drum / 40 gal			Final Purge Volume:	40

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/9/2008	
Eh:	Horiba U-22	12/9/2008	
Conductivity:	Horiba U-22	12/9/2008	
DO Meter:	Horiba U-22	12/9/2008	
Turbidity:	Horiba U-22	12/9/2008	
Temperature:	Horiba U-22	12/9/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)
0	-	-	-	-	-	-	1427
30	5.61	0.103	118	7.6	13.1	-76	1449
35	6.07	0.114	220	7.39	14.2	-98	1452
37	6.14	0.115	130	3.63	14.3	-105	1453
40	6.25	0.112	59	6.03	14.4	-106	1455

Comments

Pump at 2 gpm (max flow rate)

GROUNDWATER SAMPLING DATA SHEET

Project Information

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Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	40F, windy
Date:	1/6/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-9			Screen Interval:	2.9-12.9
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.54	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.28	Elevation:	10.26	One Purge Volume:	1.2352
Depth to Bottom:	13	Feet of Water:	7.72	Final Purge Volume:	1.1
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-9-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.67	0.135	18	8.21	12.28	346	1518	-	0.25
0.75	7.04	0.134	16.9	2.24	12.5	334	1521	-	0.25
1.5	7.07	0.135	13.7	1.1	12.72	325	1524	-	0.25
2.25	7.11	0.136	13	0.89	12.62	305	1527	-	0.25
3	7.1	0.137	12	0.85	12.62	290	1530	-	0.25
3.75	7.1	0.137	11.9	0.79	12.62	275	1533	5.29	0.25
4.5	7.1	0.137	10	0.78	12.6	237	1536	-	0.25

Comments

Sample time 1545

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 40F
Date:	4/1/2009	Samplers:	A Thatcher

Gauging and Purging Data

Station Number:	MW-9			Screen Interval:	2.9-12.9
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.54	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	5.77	Elevation:	9.77	One Purge Volume:	1.14
Depth to Bottom:	12.88	Feet of Water:	7.11	Final Purge Volume:	1.75
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-9-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	8'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.18	0.123	9.6	2.79	9.5	-82	1209	5.77	0.2
1	6.51	0.124	8.9	2.92	8.8	-99	1214	5.79	0.2
2	6.53	0.124	8.6	2.74	8.8	102	1219	5.78	0.2
3	6.56	0.124	8.7	2.77	8.9	106	1224	5.78	0.2
3.6	6.6	0.124	7.7	2.72	9	112	1227	5.77	0.2
4.4	6.64	0.124	6.8	2.69	9	118	1231	5.77	0.2
5	6.65	0.125	5.9	2.69	9	121	1234	5.78	0.2
5.8	6.66	0.125	5.4	2.68	9	124	1238	5.78	0.2
7	6.7	0.124	2.7	2.66	9.2	128	1244	5.78	0.2

Comments

WELL DEVELOPMENT DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	**Everett, WA**
Project/Task No.:	33761354	Weather:	**Rain, wind, 35F**
Date:	12/12/2008	Samplers:	**D Lewis**

Gauging and Purging Data

Well Number:	MW-10			Screen Interval:	2.5-12.5		
Reference Point:	TOC	Elevation	15.33	Well Diameter:	2"	Annulus Diameter:	
Depth to Water:	5.05	Elevation	10.28	Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)		0.16	
Depth to Bottom:	12.65	Feet of Water:	7.6	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)			
Purge Method:	whale pump			One Purge Volume:	1.216		
Water Disposal/Qty:	Drum / 40 gal			Final Purge Volume:	40		

Meter Information

	Model	Calibration Date	Comments
pH:	Horiba U-22	12/12/2008	
Eh:	Horiba U-22	12/12/2008	
Conductivity:	Horiba U-22	12/12/2008	
DO Meter:	Horiba U-22	12/12/2008	
Turbidity:	Horiba U-22	12/12/2008	
Temperature:	Horiba U-22	12/12/2008	
Other:			

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)
0	5.47	0.181	999	5.2	11.9	33	1029
	5.25	0.159	999	2.08	12.5	34	1038
	5.26	0.179	601	4.73	12.5	29	1046
10	5.11	0.185	999	2.92	12.3	-18	1052
	5.04	0.169	999	2.11	12.4	-14	1104
20	5.00	0.186	317	1.96	12.6	-24	1113
25	5.00	0.184	366	1.39	12.7	-35	1123
	5.06	0.168	366	3.24	12.2	-37	1134
	4.98	0.166	259	1.76	12.8	-39	1149
	4.97	0.177	239	1.33	13.1	-42	1157
	4.99	0.167	160	1.4	13.2	-43	1202
40	4.98	0.166	150	1.04	12.7	-41	1208

Comments

Pump starting/stopping

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	overcast, 45F
Date:	1/6/2009	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	MW-10			Screen Interval:	2.5-12.5'
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.33	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4.72	Elevation:	10.61	One Purge Volume:	1.2288
Depth to Bottom:	12.4	Feet of Water:	7.68	Final Purge Volume:	1.2
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 1/6/09
ORP:	Horiba U-22 1/6/09
Conductivity:	Horiba U-22 1/6/09
DO Meter:	Horiba U-22 1/6/09
Turbidity:	Horiba U-22 1/6/09
Temperature:	Horiba U-22 1/6/09
Other:	

Sampling Data

Sample Name:	MW-10-010609
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	7'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	5.89	75	5.7	0	10	132	1508	4.72	0.25
0.25	6.16	73	1.1	0	9.6	80	1509	4.93	0.25
1	6.3	74	1.6	0	9.7	52	1512	5.01	0.25
1.75	6.37	74	1.4	0	9.8	38	1515	5.1	0.25
2.5	6.54	75	1.3	0	9.9	16	1518	5.15	0.25
3.25	6.57	74	1.4	0	9.8	7	1521	5.17	0.25
4	6.63	75	1.3	0	10	0	1524	5.18	0.25
4.75	6.64	75	1.3	0	10	-1	1527	5.21	0.25

Comments

Sample at 1535

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Rain, approx 45F
Date:	4/1/2009	Samplers:	D Lewis

Gauging and Purging Data

Station Number:	MW-10			Screen Interval:	2.5-12.5
Station Type:	Monitoring well			Well Diameter:	2" Annulus Dia.:
Well Condition:	good			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	0.16
Reference Point:	TOC	Elevation:	15.33	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	8.52	Elevation:	6.81	One Purge Volume:	0.6496
Depth to Bottom:	12.58	Feet of Water:	4.06	Final Purge Volume:	1.6
Depth to LNAPL:	NA	Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	discharge to drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 4/1/09
ORP:	Horiba U-22 4/1/09
Conductivity:	Horiba U-22 4/1/09
DO Meter:	Horiba U-22 4/1/09
Turbidity:	Horiba U-22 4/1/09
Temperature:	Horiba U-22 4/1/09
Other:	

Sampling Data

Sample Name:	MW-10-040109
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (liters)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.39	0.114	5	3.2	8.4	123	1207	5.52	0.25
0.75	6.55	0.112	4.2	1.77	8.5	71	1210	5.62	0.4
2	6.55	0.112	4.2	1.7	8.5	56	1213	5.66	0.5
3.5	6.56	0.112	3.9	1.66	8.5	45	1216	5.68	0.5
5	6.55	0.111	3.9	1.67	8.5	41	1219	5.72	0.5
6.5	6.55	0.11	3.8	1.67	8.5	39	1222	5.76	0.5

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/11/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-1			Screen Interval:	5-10'
Station Type:	Temporary monitor well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	4'	Elevation:		One Purge Volume:	
Depth to Bottom:	10'	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12/11/08
ORP:	
Conductivity:	Horiba U-22 12/11/08
DO Meter:	Horiba U-22 12/11/08
Turbidity:	Horiba U-22 12/11/08
Temperature:	Horiba U-22 12/11/08
Other:	

Sampling Data

Sample Name:	SB-1
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)?	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	5.47	84.8	>999	9.66	11.1	-73	1006		0.2
	4.86	85.1	>999	9.34	11.8	-65	1008		0.2
	4.64	85	546	9.23	12.3	-59	1010		0.2
	4.54	14.6	120	9.23	12.4	-66	1013		0.2
	4.36	0.3	53.4	9.17	12.3	-63	1018		0.2
	4.31	84.4	29	9.2	12.3	-63	1022		0.2
	4.31	0.999	30.9	8.93	12.3	-72	1026		0.2
	4.43	0.4	23.4	9.4	12	-66	1030		0.2
	4.43	0.7	29.8	9.64	12.1	-52	1032		0.2
	4.71	0.6	29	9.55	12.1	-59	1035		0.2
	4.88	84.6	28.8	9.43	12	-85	1038		0.2

Comments

** Conductivity readings are suspect - may not be recorded in consistent units - JLW 1/29/09**

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/9/2008	Samplers:	J McCullough, J Wellmeyer

Gauging and Purging Data

Station Number:	SB-7			Screen Interval:	5-10'
Station Type:	Temporary monitor well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:		Elevation:		One Purge Volume:	
Depth to Bottom:	10	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	Drum / 2 gal

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12/10/08
Eh:	
Conductivity:	Horiba U-22 12/10/08
DO Meter:	Horiba U-22 12/10/08
Turbidity:	Horiba U-22 12/10/08
Temperature:	Horiba U-22
Other:	

Sampling Data

Sample Name:	SB-7
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	10'

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0									
	4.51	0.1	53.3	10.3	11.8	-20	900		0.25
	5.56	0.2	27.9	10.22	12.2	-39	906		0.25
	5.95	0.9	12.5	10.27	12.3	-38	910		0.25
	5.72	0.095	9.6	10.14	12.5	-49	916		0.25

Comments

Purge water has rotten egg/H2S odor **conductivity readings vary widely in magnitude & seem suspect - JLW 1/29/09**

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast, 50F
Date:	12/9/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-8			Screen Interval:	5-10'		
Station Type:	Temporaring monitor well			Well Diameter:	1"	Annulus Dia.:	
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)			
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)			
Depth to Water:		Elevation:		One Purge Volume:			
Depth to Bottom:	10	Feet of Water:		Final Purge Volume:			
Depth to LNAPL:		Thickness:		Purge Method:			
LNAPL Description:				Water Disposal/Qty:	Drum / 3.5 gallons		

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12-9-08
Eh:	
Conductivity:	Horiba U-22 12-9-08
DO Meter:	Horiba U-22 12-9-08
Turbidity:	Horiba U-22 12-9-08
Temperature:	Horiba U-22 12-9-08
Other:	

Sampling Data

Sample Name:	SB-8
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	10'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1038		0.175
	6.54	0.141	101	10.51	11.7	7	1041		0.175
	6.01	0.141	70	10.27	21.3	-37	1047		0.175
	6.08	0.139	440	10.3	12.3	-35	1052		0.175
	6.12	0.141	21	10.37	12.3	-26	1055		0.175
	6.07	0.135	12.2	10.38	12.3	-30	1056		0.175
	6.16	0.14	8.1	10.38	12.4	-22	1059		0.175

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/9/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-9			Screen Interval:	5-10 feet
Station Type:	Temporary Monitor Well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:		Elevation:		One Purge Volume:	
Depth to Bottom:	10	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:	NA			Water Disposal/Qty:	approx 2 gal

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12/9/08
Eh:	
Conductivity:	Horiba U-22 12/9/08
DO Meter:	Horiba U-22 12/9/08
Turbidity:	Horiba U-22 12/9/08
Temperature:	Horiba U-22 12/9/08
Other:	

Sampling Data

Sample Name:	SB-9
Sample Method:	Low Flow
Sampling Device:	Peristaltic Pump
Tubing Depth:	
Pump Intake Depth:	

Field Test Kit Results:

PID:	
DO:	
Alkalinity:	
Ferrous Iron:	
Other:	

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0	6.14	0.134	95.3	10.44	12.4	-20	1144		
	5.74	0.134	146	10.13	12.9	-39	1147		
	6.11	0.137	98	10.04	13	-42	1150		
	6.09	0.135	82.3	10.01	13	-41	1153		
	5.66	0.136	52.6	10.02	13	-42	1156		
	5.68	0.138	11.9	9.99	13	-43	1159		
	5.71	0.138	30.5	9.97	13	-42	1202		
	5.65	0.5	12.2	10.04	13	-42	1205		
	5.65	0.6	8.5	10.06	13	-40	1208		

Comments

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/11/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-10			Screen Interval:	5-10'
Station Type:	Temporary monitor well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:	3'	Elevation:		One Purge Volume:	
Depth to Bottom:	10'	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12/11/08
ORP:	
Conductivity:	Horiba U-22 12/11/08
DO Meter:	Horiba U-22 12/11/08
Turbidity:	Horiba U-22 12/11/08
Temperature:	Horiba U-22 12/11/08
Other:	

Sampling Data

Sample Name:	SB-10
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)?	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							913		
	3.6	75	377	10.02	11.1	53	915		
	4.25	61.9	143	9.75	11.8	-21	917		
	4.73	61.2	77.6	9.59	12.1	-41	919		
	5.02	60.7	43.6	9.59	12.1	-53	921		
	9.58	62	20.4	9.79	12	-224	923		
	9.11	61.3	31.8	9.76	12	-189	925		
	10.93	61.4	47	9.77	12	-153	927		
	5.37	0.933	10.9	9.49	12	-28	931		
	5.45	0.9	7.4	9.81	11.9	-48	933		
	5.6	0.9	7.9	9.93	11.7	-53	935		

Comments

Horiba probe rinsed with deionized water at approx 930 am due to unexpected behavior of pH meter readings. ** conductivity readings are inconsistent and may be suspect - JLW 1/29/09**

GROUNDWATER SAMPLING DATA SHEET

Project Information Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/11/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-11			Screen Interval:	5-10'
Station Type:	Temporary monitor well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:		Elevation:		One Purge Volume:	
Depth to Bottom:	10'	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	Horiba U-22 12/11/08
ORP:	
Conductivity:	Horiba U-22 12/11/08
DO Meter:	Horiba U-22 12/11/08
Turbidity:	Horiba U-22 12/11/08
Temperature:	Horiba U-22 12/11/08
Other:	

Sampling Data

Sample Name:	SB-10
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)?	Turbidity (NTU)	DO (mg/L)	Temperature (ºC)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0							1312		
	4.96	0.4	45.2	10.44	11.5	-36	1319		
	5.1	0.09	15.9	9.83	11.9	-84	1324		
	5.34	0.9	4	10.29	12	-69	1329		
	5.22	86.7	3.7	10.14	12	-85	1331		
	5.18	87.2	1.5	9.95	12.2	-86	1335		

Comments

** conductivity readings are inconsistent and may be suspect - JLW 1/29/09**

GROUNDWATER SAMPLING DATA SHEET

Project Information

Page _____ of _____

Project Name:	Everett Shipyard Upland RI	Location:	Everett, WA
Project/Task No.:	33761354	Weather:	Overcast 50F
Date:	12/4/2008	Samplers:	J McCullough

Gauging and Purging Data

Station Number:	SB-19			Screen Interval:	5-10'
Station Type:	Temporary monitor well			Well Diameter:	1" Annulus Dia.:
Well Condition:				Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	
Reference Point:	TOC	Elevation:		Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	
Depth to Water:		Elevation:		One Purge Volume:	
Depth to Bottom:	10'	Feet of Water:		Final Purge Volume:	
Depth to LNAPL:		Thickness:		Purge Method:	low flow
LNAPL Description:				Water Disposal/Qty:	

Containers

Analysis	Type	Primary Qty	MS/MSD Qty

Meter Information

	Model & Calibration Date
pH:	REJECTED CALIBRATION
ORP:	
Conductivity:	
DO Meter:	
Turbidity:	
Temperature:	
Other:	

Sampling Data

Sample Name:	SB-19
Sample Method:	low flow
Sampling Device:	peristaltic pump
Tubing Depth:	9'
Pump Intake Depth:	

Field Test Kit Results:

PID:	NA
DO:	NA
Alkalinity:	NA
Ferrous Iron:	NA
Other:	NA

QA/QC Samples:

Duplicate:	
Replicate:	
MS/MSD:	
Blank:	
Other:	

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)

Comments

Purge at approx 250 ml/min (0.25L/min) for nearly 30 minutes prior to sampling. Initial purge water is gray, silty and smells of rotten eggs. Final sampled water smells of rotten eggs. Start purge at 1227. Collect GW sample at 1255. Water quality meter not functioning.

URS

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard	Location:	Upland Area East of Boat Lift
Project/Task No.:	33761354	Weather:	Sunny 70 F
Date:	6/24/2010	Samplers:	Anthony Palmieri

Gauging and Purging Data

Station Number:	---			Screen Interval:	---
Station Type:	---			Well Diameter:	--- Annulus Dia.: ---
Well Condition:	---			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	---
Reference Point:	---	Elevation:	---	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	---
Depth to Water:	~8 ft bgs	Elevation:	---	One Purge Volume:	
Depth to Bottom:	---	Feet of Water:	---	Final Purge Volume:	0.75 gallions
Depth to LNAPL:	---	Thickness:	---	Purge Method:	peristaltic pump
LNAPL Description:	---			Water Disposal/Qty:	15 gallon drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty
VOCs	glass VOA	40 ml (3)	
TPH-Dx	glass amber	1 L (1)	

Meter Information

	Model & Calibration Date
pH:	---
Eh:	---
Conductivity:	---
DO Meter:	---
Turbidity:	---
Temperature:	---
Other:	---

Sampling Data

Sample Name:	SB-93 GW
Sample Method:	Grab
Sampling Device:	Peristaltic pump
Tubing Depth:	~9 ft bgs--- ~1 ft below top of water
Pump Intake Depth:	

Field Test Kit Results:

PID:	0.0 ppm
DO:	---
Alkalinity:	---
Ferrous Iron:	---
Other:	---

QA/QC Samples:

Duplicate:	---
Replicate:	---
MS/MSD:	---
Blank:	---
Other:	---

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0									

Comments

Grab water sample was collected during soil sampling. Water was encountered at ~8 ft bgs. Sample was collected ~ 1 ft below top of water. Flow rate was 325 mL/min. Water was moderately turbid when pumping was started, but cleared up before sampling. Water had a slight sulfur odor. ~0.75 gallons purged before sampling.

URS

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard	Location:	Upland Area East of Boat Lift
Project/Task No.:	33761354	Weather:	Sunny 70 F
Date:	6/24/2010	Samplers:	Anthony Palmieri

Gauging and Purging Data

Station Number:	---			Screen Interval:	---
Station Type:	---			Well Diameter:	--- Annulus Dia.: ---
Well Condition:	---			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	---
Reference Point:	---	Elevation:	---	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	---
Depth to Water:	~6.5 ft bgs	Elevation:	---	One Purge Volume:	
Depth to Bottom:	---	Feet of Water:	---	Final Purge Volume:	1.0 gallions
Depth to LNAPL:	---	Thickness:	---	Purge Method:	peristaltic pump
LNAPL Description:	---			Water Disposal/Qty:	15 gallon drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty
VOCs	glass VOA	40 ml (3)	40 mL
TPH-Dx	glass amber	1 L (1)	1 L

Meter Information

	Model & Calibration Date
pH:	---
Eh:	---
Conductivity:	---
DO Meter:	---
Turbidity:	---
Temperature:	---
Other:	---

Sampling Data

Sample Name:	SB-94GW
Sample Method:	Grab
Sampling Device:	Peristaltic pump
Tubing Depth:	~7.5 ft bgs--- ~1 ft below top of water
Pump Intake Depth:	

Field Test Kit Results:

PID:	0.0 ppm
DO:	---
Alkalinity:	---
Ferrous Iron:	---
Other:	---

QA/QC Samples:

Duplicate:	collected
Replicate:	---
MS/MSD:	collected
Blank:	---
Other:	---

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0									

Comments

Grab water sample was collected during soil sampling. Water was encountered at ~6.5ft bgs. Sample was collected ~ 1 ft below top of water. Flow rate was 325 mL/min. Water was clear from the start of purging to sampling. Water had a slight sulfur odor. ~1.0 gallons purged before sampling. A duplicate and MS/MSD were collected along with this sample.

URS

GROUNDWATER SAMPLING DATA SHEET

Project Information

Project Name:	Everett Shipyard	Location:	Upland Area East of Boat Lift
Project/Task No.:	33761354	Weather:	Sunny 70 F
Date:	6/24/2010	Samplers:	Anthony Palmieri

Gauging and Purging Data

Station Number:	---			Screen Interval:	---
Station Type:	---			Well Diameter:	--- Annulus Dia.: ---
Well Condition:	---			Gallons per Casing Foot: (2" well: 0.16 gal/ft; 4" well: 0.65 gal/ft)	---
Reference Point:	---	Elevation:	---	Gallons per Annulus Foot: (8" annulus with 2" casing = 1.85 gal/ft; 6" annulus with 2" casing = 1.34 gal/ft)	---
Depth to Water:	~8 ft bgs	Elevation:	---	One Purge Volume:	
Depth to Bottom:	---	Feet of Water:	---	Final Purge Volume:	0.75 gallions
Depth to LNAPL:	---	Thickness:	---	Purge Method:	peristaltic pump
LNAPL Description:	---			Water Disposal/Qty:	15 gallon drum

Containers

Analysis	Type	Primary Qty	MS/MSD Qty
VOCs	glass VOA	40 ml (3)	40 mL
TPH-Dx	glass amber	1 L (1)	1 L

Meter Information

	Model & Calibration Date
pH:	---
Eh:	---
Conductivity:	---
DO Meter:	---
Turbidity:	---
Temperature:	---
Other:	---

Sampling Data

Sample Name:	SB-95GW
Sample Method:	Grab
Sampling Device:	Peristaltic pump
Tubing Depth:	~9 ft bgs--- ~1 ft below top of water
Pump Intake Depth:	

Field Test Kit Results:

PID:	0.0 ppm
DO:	---
Alkalinity:	---
Ferrous Iron:	---
Other:	---

QA/QC Samples:

Duplicate:	---
Replicate:	---
MS/MSD:	---
Blank:	---
Other:	---

Field Parameters

Volume (gallons)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)	ORP (mV)	Time (24 hr)	Water Level (Ft below TOC)	Flow Rate (L/min)
0									

Comments

Grab water sample was collected during soil sampling. Water was encountered at ~9 ft bgs. Sample was collected ~ 1 ft below top of water. Flow rate was 325 mL/min. Water was clear from the start of purging to sampling. Water had a slight sulfur odor. ~0.75 gallons purged before sampling.

APPENDIX F

SEDIMENT CORE LOGS AND SAMPLE COLLECTION FORMS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring BC-1

Date(s) Drilled	**5/21/10**	Logged By	**EL/AT**	Checked By	**AP**
Drilling Contractor	**URS**	Total Depth of Borehole	**3 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		BC-1-1				SP	Very dark gray to black silty very fine to fine SAND, occasional gravel, wood debris, rubber, glass	
1						GP	GRAVEL (strong hydrocarbon odor)	
						SP	Gray to very dark gray fine to coarse silty SAND with pebbles	
2							Grading brown silty coarse SAND (hydrocarbon odor)	
		BC-1-2					Grading gray fine to coarse SAND, little silt (strong hydrocarbon odor, free product in hole as tube comes up)	
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

URS

Project: Everett Shipyard	Log of Boring BC-2
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	5/21/10	Logged By	EL/AT	Checked By	AP
Drilling Contractor	URS	Total Depth of Borehole	3 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (%)	SAMPLES OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		BC-2-1				ML	Brown grading black SILT, trace fine to coarse sand, wood debris	
						SP	Gray fine to coarse SAND, trace silt, scattered wood residue	
1							Grading gray fine SAND (loose) (wet)	
							Grading coarse, mostly fines	
							Grading occasional gravel	
							Grading trace shell fragments	
2		BC-2-2						
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

URS

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring BC-3

Sheet 1 of 1

Date(s) Drilled	**5/21/10**	Logged By	**EL/AT**	Checked By	**AP**
Drilling Contractor	**URS**	Total Depth of Borehole	**3 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0						SP	Olive silty SAND	
							Grading black silty SAND, pebbles, woody debris (no hydrocarbon odor noted)	
1							Grading gray fine to coarse SAND, trace shell debris (wet) (no hydrocarbon odor noted)	
2								
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

URS

Log of Boring BC-4

Sheet 1 of 1

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Date(s) Drilled	**5/21/10**	Logged By	**EL/AT**	Checked By	**AP**
Drilling Contractor	**URS**	Total Depth of Borehole	**3 feet**		
Drilling Method	**Hand Auger**	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		BC-4-1				SP	Olive SILT, black SAND and GRAVEL, occasional glass debris (some hydrocarbon odor)	
1							Grading gray fine to coarse SAND, more fines, trace shell debris	
							Grading scattered gravel	
							Grading trace wood debris	
2		BC-4-2						
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

URS

Project: Everett Shipyard	Log of Boring BC-5
Project Location: Everett, Washington	Sheet 1 of 1
Project Number: 33761354	

Date(s) Drilled	5/21/10	Logged By	EL/AT	Checked By	AP
Drilling Contractor	URS	Total Depth of Borehole	3 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		BC-5-1				ML	Olive SILT, woody debris Glass, electrical tape, rubber gasket Black SILT, wood debris (moderately cohesive) (moderate hydrocarbon odor, slight sheen in standing water nearby)	
1						SP	Gray fine to coarse SAND, scattered gravel, numerous shell fragments, trace wood debris (no hydrocarbon odor noted)	
2		BC-5-2						
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

URS

ENV2 W/O WELL T:\ONEWORLD\33761354 EVERETT SHIPYARD\33761354.GPJ EVERETTSHIPYARD.GLB URSSEA3.GDT 8/24/10

Project: Everett Shipyard
Project Location: Everett, Washington
Project Number: 33761354

Log of Boring BC-6

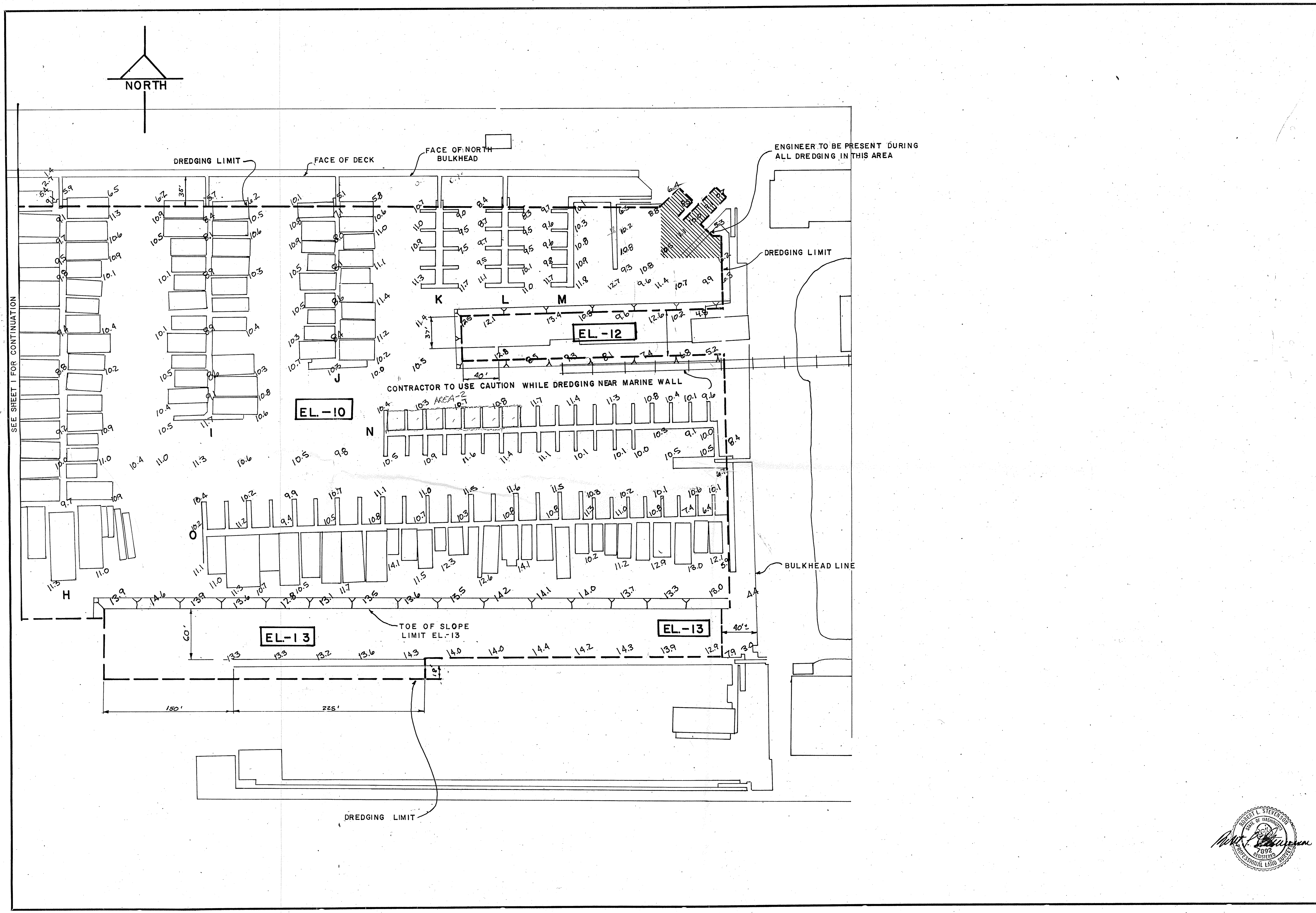
Sheet 1 of 1

Date(s) Drilled	5/21/10	Logged By	EL/AT	Checked By	AP
Drilling Contractor	URS	Total Depth of Borehole	3 feet		
Drilling Method	Hand Auger	Drill Bit Size/Type			
Drill Rig Type		Sampling Method			

Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (%)	OVM (ppm)	Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
0		BC-6-1				GP	GRAVEL	
						SP	Brown fine to coarseSAND	
							Grading gray (no hydrocarbon odor noted)	
1							Grading gray fine to coarse SAND, trace shell fragments, considerable gravel (no hydrocarbon odor noted)	
2		BC-6-2						
3							Boring was completed to 3' bgs. Groundwater was not encountered.	
4								
5								

APPENDIX G

NORTH MARINA RECORD DRAWINGS FOR MAINTENANCE FACILITY



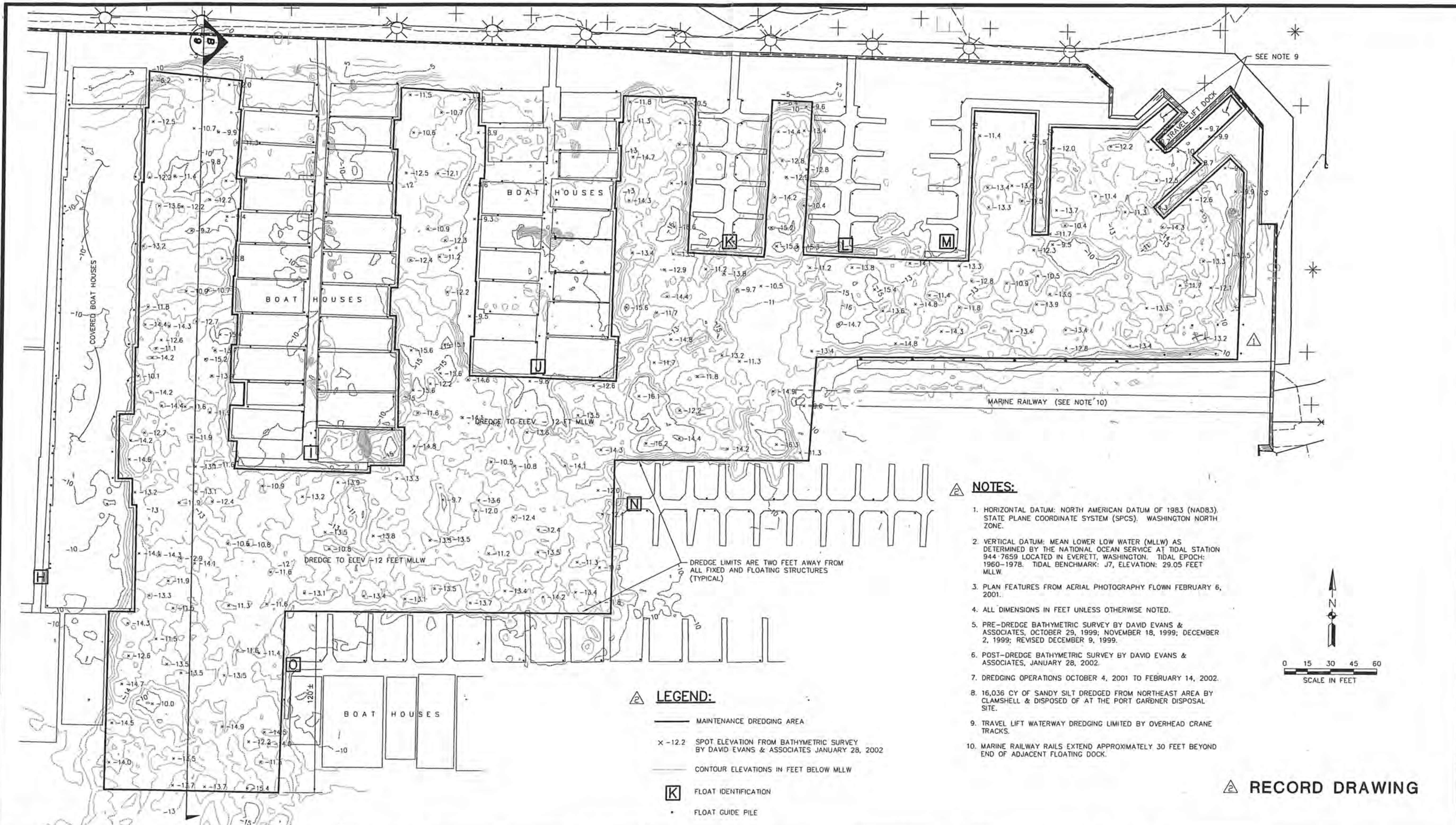
NO.	DATE	BY	REVISION
1	12/90	ETH	ADDED SOUNDINGS FROM FALL DREDGE SERIES

REID MIDDLETON

19031 33rd Ave. W, Suite 301
Lynnwood, WA 98036
206/775-3434

POST-DREDGE SOUNDINGS
AT THE PORT OF EVERETT MARINA
FOR
NEHALEM RIVER DREDGING, INC.

SCALE 1" = 50'
DES.
DR. KJW
CH. RAH
F.B. 2209VV 2209UU
SHEET NO. 2 OF 4 SHEETS
DATE 3-20-90
FILE NO. 22-90-003-001



NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83), STATE PLANE COORDINATE SYSTEM (SPCS), WASHINGTON NORTH ZONE.
2. VERTICAL DATUM: MEAN LOWER LOW WATER (MLLW) AS DETERMINED BY THE NATIONAL OCEAN SERVICE AT TIDAL STATION 944 7659 LOCATED IN EVERETT, WASHINGTON. TIDAL EPOCH: 1960-1978. TIDAL BENCHMARK: J7, ELEVATION: 29.05 FEET MLLW.
3. PLAN FEATURES FROM AERIAL PHOTOGRAPHY FLOWN FEBRUARY 6, 2001.
4. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
5. PRE-DREDGE BATHYMETRIC SURVEY BY DAVID EVANS & ASSOCIATES, OCTOBER 29, 1999; NOVEMBER 18, 1999; DECEMBER 2, 1999; REVISED DECEMBER 9, 1999.
6. POST-DREDGE BATHYMETRIC SURVEY BY DAVID EVANS & ASSOCIATES, JANUARY 28, 2002.
7. DREDGING OPERATIONS OCTOBER 4, 2001 TO FEBRUARY 14, 2002.
8. 16,036 CY OF SANDY SILT DREDGED FROM NORTHEAST AREA BY CLAMSHELL & DISPOSED OF AT THE PORT GARDNER DISPOSAL SITE.
9. TRAVEL LIFT WATERWAY DREDGING LIMITED BY OVERHEAD CRANE TRACKS.
10. MARINE RAILWAY RAILS EXTEND APPROXIMATELY 30 FEET BEYOND END OF ADJACENT FLOATING DOCK.

LEGEND:

——	MAINTENANCE DREDGING AREA
× -12.2	SPOT ELEVATION FROM BATHYMETRIC SURVEY BY DAVID EVANS & ASSOCIATES JANUARY 28, 2002
——	CONTOUR ELEVATIONS IN FEET BELOW MLLW
K	FLOAT IDENTIFICATION
•	FLOAT GUIDE PILE

RECORD DRAWING

Port of EVERETT
P.O. BOX 538
EVERETT, WA 98206
(425) 259-3164

FOSTER WHEELER HARTMAN CONSULTING CORPORATION

PROJECT NO. H036.0003

NO.	DATE	BY	REVISION
2	3/26/02	JS	REVISED: PLAN, LEGEND & NOTES ADDED: RECORD DRAWING
1	12/13/01	JS	REVISED: DREDGING LIMITS, DELETED SHED

PROJECT ENGINEER: J.SCOTT	SCALE: N/A
DESIGNED BY: R.WILLS, J.SCOTT	DATE: 5/18/2001
DRAWN BY: A.CRABTREE	CHECKED BY: W.ELMER

PORT OF EVERETT

MARINA AND BOAT LAUNCH MAINTENANCE DREDGING
MARINA DREDGE PLAN
NE DETAIL

DWG. NO. MPOEPD08
CIP NO. 16859 - 21P
PROJECT NO. MR-DR-2001-02
SHEET NO. 6 OF 12

I:\Projects\h0360003\dwg\MPOEPD08.dwg 04/26/02 03:15:24 PM PDT

APPENDIX H

ANALYTICAL SUMMARY TABLES

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	BSS-1	BSS-1	BSS-2	BSS-3	BSS-3	BSS-4	BSS-4	LB1/MW-1		LB2/MW-2	LB9	LB10	LB11	LB12	LB13	LB14	MW-4	MW-4
Sample ID Depth Interval (feet bgs):	1.0 - 1.5	3.0 -3.5	1.0 - 1.5	1.0 - 1.5	2.5 - 3.0	1.0 - 1.5	3.0 - 3.5	0 - 1		0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 0.5	1 - 2
Date Collected:	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	3/7/2003		3/7/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	5/27/2003	12/9/2008	12/9/2008
Field QC:									Field Duplicate									
TPH (mg/kg)																		
Diesel-range**	5.4 U	5.4 U	33*	6.2*	180*	5.2 U	NA	25U	25U	25U	7.6	19	43	15	58	140	13	NA
Oil-range**	36	11 U	200	51	1,100	10 U	NA	50U	50U	50U	15	200	250	35	170	510	110	NA
cPAHs (ug/kg)																		
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	91	24
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	140	48
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	110	34
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	36
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	41
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70	24
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35	24 U
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**172**	53
PCBs (ug/kg)																		
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	NA
Arsenic**	2.40	5.79	4.38	4.77	5.99	2.54	NA	3.0U	2.8U	3.0U	NA	NA	NA	NA	NA	NA	8	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1 U	NA
Cadmium	0.535 U	0.561 U	0.498 U	1.49	0.533 U	0.507 U	NA	0.50U	0.47U	0.51U	NA	NA	NA	NA	NA	NA	0.2	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	18	17	13	NA	NA	NA	NA	NA	NA	22.2	NA
Copper**	10.7 J	9.02 J	22.3 J	13.3 J	19.2 J	5.70	5.76	19	16	9.3	NA	NA	NA	NA	NA	NA	21.9	NA
Lead**	4.29	1.80	13.0	3.88	14.2	1.40	NA	6.0U	5.6U	6.1U	NA	NA	NA	NA	NA	NA	18	NA
Mercury	0.106 U	0.108 U	0.104 U	0.0962 U	0.0785 U	0.103 U	NA	0.02U	0.02U	0.02U	NA	NA	NA	NA	NA	NA	0.04	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3 U	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	NA
Zinc	35.2 J	32.3 J	163 J	198	71.8 J	20.6	20.9	28	25	18	NA	NA	NA	NA	NA	NA	42	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	MW-5	MW-5	MW-6	MW-6	MW-7	MW-7	MW-7	MW-7	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	SB-01	SB-01	SB-01	SB-01
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	2 - 3	3 - 4	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5
Date Collected:	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008
Field QC:																			
TPH (mg/kg)																			
Diesel-range**	13	NA	14	NA	140	NA	NA	NA	24	NA	NA	74	NA	NA	NA	5.7 U	6.3 U	NA	6.8 U
Oil-range**	160	NA	57	NA	420	NA	NA	NA	140	NA	NA	350	NA	NA	NA	11 U	13 U	NA	14 U
cPAHs (ug/kg)																			
Benzo(a)anthracene	29	NA	11	NA	400 J	4.6 U	NA	NA	75	80	160 J	1,000 J	68 J	92 J	11 J	4.7 U	4.8 U	NA	NA
Chrysene	48	NA	20	NA	520 J	4.6 U	NA	NA	130	120	200 J	1,200	82 J	120 J	12 J	4.7 U	4.8 U	NA	NA
Benzo(b)fluoranthene	32	NA	11	NA	570 J	4.6 U	NA	NA	86	79	130 J	1,400	52 J	94 J	11 J	4.7 U	4.8 U	NA	NA
Benzo(k)fluoranthene	32	NA	11	NA	490 J	4.6 U	NA	NA	88	79	130 J	1,100	65 J	94 J	11 J	4.7 U	4.8 U	NA	NA
Benzo(a)pyrene**	52	NA	13	NA	**470 J**	4.6 U	NA	NA	93	100	**170J**	**1,300 J**	86 J	120 J	12 J	4.7 U	4.8 U	NA	NA
Indeno(1,2,3-cd)pyrene	16	NA	9.6	NA	160 J	4.6 U	NA	NA	64 U	66	87 J	740 J	43	91 J	8.9 J	4.7 U	4.8 U	NA	NA
Dibenzo(a,h)anthracene	9.6 U	NA	4.6	NA	61 U	4.6 U	NA	NA	64 U	29	43 J	220	18	37 J	4.7 UJ	4.7 U	4.8 U	NA	NA
TTEC**	63	NA	18	NA	**637 J**	NA	NA	NA	119	135	**227 J**	**1,758 J**	111 J	**162 J**	16 J	NA	NA	NA	NA
PCBs (ug/kg)																			
Aroclor 1016	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	1,200 J	31 UJ	NA	NA	NA	NA	NA	320 J	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	200 J	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	310 UJ	31 UJ	NA	NA	NA	NA	NA	99 UJ	30 UJ	NA	NA	33 U	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	**1,200 J**	NA	NA	NA	NA	NA	NA	520 J	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	NA	NA	NA	NA	1,800	6.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 U	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	930	5.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	360	3.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4 U	NA	NA	NA
Metals (mg/kg)																			
Antimony**	5 U	NA	6 U	NA	20	5 U	NA	NA	5 U	NA	NA	**80**	5 UJ	NA	NA	6 U	6 U	NA	NA
Arsenic**	9	NA	6 U	NA	**210**	17	NA	NA	19	NA	NA	**510**	10	NA	NA	6	6	NA	NA
Beryllium	0.1 U	NA	0.1 U	NA	0.3	0.2	NA	NA	0.1	NA	NA	0.3	NA	NA	NA	0.1	0.2	NA	NA
Cadmium	0.2	NA	0.2 U	NA	1.7	0.5	NA	NA	0.3	NA	NA	3.5	0.2 U	NA	NA	0.2 U	0.3	NA	NA
Chromium	28.3	NA	23.9	NA	72	64.1	29.7	NA	26.8	NA	NA	101	25.1	NA	NA	24.1	28.8	30.0	NA
Copper**	37.1	7.9	38.6	10.8	2,410	66.7	292 J	18.7	56.1	549 J	187	1,430	25.3 J	NA	NA	12.0	17.1	18.4	NA
Lead**	28	NA	26	NA	**336**	16	NA	NA	42	NA	NA	**619**	12 J	NA	NA	3	4	NA	NA
Mercury	0.14	0.04 UJ	0.31	0.05 U	9.3	3.28	1.20	0.27 J	0.11	1.70	0.97 J	2.45	0.04 U	NA	NA	0.04 U	0.05 U	NA	NA
Nickel	32	NA	24	NA	31	29	NA	NA	33	NA	NA	44	NA	NA	NA	23	55	33	NA
Selenium	5 U	NA	6 U	NA	10 U	5 U	NA	NA	5 U	NA	NA	10 U	NA	NA	NA	6 U	6 U	NA	NA
Silver	0.3 U	NA	0.3 U	NA	0.9 U	0.3 U	NA	NA	0.3 U	NA	NA	**1.3**	0.3 U	NA	NA	0.3 U	0.4 U	NA	NA
Thallium	5 U	NA	6 U	NA	10 U	5 U	NA	NA	5 U	NA	NA	10 U	NA	NA	NA	6 U	6 U	NA	NA
Zinc	61	NA	48	NA	1,790	195	404	51	111	283	258	2,670	78	NA	NA	29	69	41	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-05	SB-05	SB-05*	SB-05*	SB-06	SB-06	SB-06	SB-06	SB-07	SB-07	SB-07	SB-07
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5
Date Collected:	12/11/2008	12/11/2008	12/11/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008
Field QC:																			
TPH (mg/kg)																			
Diesel-range**	20	5.7 U	NA	18	5.4 UJ	41	NA	190	5.7 UJ	360 J	230	1,000	1,200	240 J	5.8 UJ	2,300	2,400	1,100 J	12
Oil-range**	61	11 U	NA	58	11 UJ	160	NA	1,500	11 UJ	12 UJ	65	14,000	17,000	4,000 J	12 UJ	15,000	27,000	14,000 J	79
cPAHs (ug/kg)																			
Benzo(a)anthracene	18	4.8 U	NA	220	4.6 U	260	4.7 U	620	60 UJ	4.6 U	NA	32 J	NA	NA	NA	49 UJ	50 U	NA	NA
Chrysene	23	4.8 U	NA	260	4.6 U	300	4.7 U	930	60 UJ	4.6 U	NA	65 J	NA	NA	NA	150 J	50 U	NA	NA
Benzo(b)fluoranthene	18	4.8 U	NA	160	4.6 U	210	4.7 U	1,000	60 UJ	4.6 U	NA	36 J	NA	NA	NA	110 J	50 UJ	NA	NA
Benzo(k)fluoranthene	18	4.8 U	NA	200	4.6 U	250	4.7 U	990	60 UJ	4.6 U	NA	45 J	NA	NA	NA	110 J	50 UJ	NA	NA
Benzo(a)pyrene**	22 J	4.8 U	NA	250	4.6 U	260	4.7 U	860	60 UJ	4.6 U	NA	32 J	NA	NA	NA	74 J	50 UJ	NA	NA
Indeno(1,2,3-cd)pyrene	15	4.8 U	NA	120	4.6 U	120	4.7 U	680	60 UJ	4.6 U	NA	22 UJ	NA	NA	NA	49 UJ	50 UJ	NA	NA
Dibenzo(a,h)anthracene	6.4	4.8 U	NA	65	4.6 U	62	4.7 U	230	60 UJ	4.6 U	NA	22 UJ	NA	NA	NA	49 UJ	50 UJ	NA	NA
TTEC**	30 J	NA	NA	329	NA	353	NA	1,221	NA	NA	NA	44 J	NA	NA	NA	98 J	NA	NA	NA
PCBs (ug/kg)																			
Aroclor 1016	30 U	NA	NA	NA	NA	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Aroclor 1242	30 U	NA	NA	NA	NA	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Aroclor 1248	30 U	NA	NA	NA	NA	NA	NA	1,300 UJ	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Aroclor 1254**	66	NA	NA	NA	NA	NA	NA	1,500	33 UJ	28 U	NA	31 U	NA	NA	NA	240	NA	NA	NA
Aroclor 1260	34	NA	NA	NA	NA	NA	NA	680 J	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Aroclor 1221	30 U	NA	NA	NA	NA	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Aroclor 1232	30 U	NA	NA	NA	NA	NA	NA	320 U	33 UJ	28 U	NA	31 U	NA	NA	NA	160 U	NA	NA	NA
Total PCBs**	100	NA	NA	NA	NA	NA	NA	2,180 J	NA	NA	NA	NA	NA	NA	NA	240	NA	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	59 J	NA	NA	NA	NA	NA	NA	7,200	3.7 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	82 J	NA	NA	NA	NA	NA	NA	4,100	5.5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	66	NA	NA	NA	NA	NA	NA	2,500	3.9 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																			
Antimony**	18	5 U	NA	5 UJ	NA	30 J	NA	60 J	6 U	NA	NA	5 U	NA	NA	NA	5 U	NA	NA	NA
Arsenic**	94	6	NA	7	NA	160	5 U	470	6	NA	NA	5 U	NA	NA	NA	6	NA	NA	NA
Beryllium	0.1	0.1	NA	0.1	NA	0.3	NA	0.3 U	NA	NA	NA	0.1 U	NA	NA	NA	0.1 U	NA	NA	NA
Cadmium	0.4	0.2 U	NA	0.3 J	NA	0.5 UJ	NA	5.7 J	0.2 U	NA	NA	0.2 U	NA	NA	NA	0.2 U	NA	NA	NA
Chromium	29.6	24.4	NA	29.9	NA	58	21.5	88	21.4	NA	NA	17.6	NA	NA	NA	19.3	NA	NA	NA
Copper**	246	10.1	NA	38.3	7.1	442	13.0	1,360	9.7	NA	NA	15.3	NA	NA	NA	25.4	NA	NA	NA
Lead**	121	3	NA	43 J	NA	188 J	NA	644 J	5	NA	NA	13	NA	NA	NA	31	NA	NA	NA
Mercury	0.70	0.06 U	NA	0.10	0.05 UJ	1.45	0.05 UJ	3.06	0.04 J	NA	NA	0.05 U	NA	NA	NA	0.05 U	NA	NA	NA
Nickel	24	28	NA	35	NA	34	NA	35	NA	NA	NA	22	NA	NA	NA	23	NA	NA	NA
Selenium	5 U	5 U	NA	5 U	NA	10 U	NA	10 U	NA	NA	NA	5 U	NA	NA	NA	5 U	NA	NA	NA
Silver	0.3 U	0.3 U	NA	0.3 UJ	NA	0.8 UJ	NA	1.3 J	0.3 U	NA	NA	0.3 U	NA	NA	NA	0.8	0.3 U	NA	NA
Thallium	5 U	5 U	NA	5 U	NA	10 U	NA	10 U	NA	NA	NA	5 U	NA	NA	NA	5 U	NA	NA	NA
Zinc	324	32	NA	84	NA	473	45	1,740	28	NA	NA	30	NA	NA	NA	48	NA	NA	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-08	SB-08	SB-08	SB-09	SB-09	SB-09	SB-09	SB-10	SB-10	SB-10	SB-11	SB-11	SB-11	SB-12	SB-12	SB-12	SB-13	SB-13
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2	4 - 5	0 - 0.5	2 - 3	4 - 5	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2
Date Collected:	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/3/2008	12/3/2008	12/3/2008	12/1/2008	12/1/2008
Field QC:																		
TPH (mg/kg)																		
Diesel-range**	73	NA	6.9 U	5.2 U	NA	NA	6.5 U	240	NA	49	32	NA	5.6 U	110	NA	NA	6.8	NA
Oil-range**	140	NA	16	15	NA	NA	14	140	NA	12	200	NA	11 U	220	NA	NA	34	NA
cPAHs (ug/kg)																		
Benzo(a)anthracene	600	4.6 U	NA	57 J	4.7 U	NA	NA	120	15 UJ	NA	46 J	NA	NA	340	6.9 J	NA	62	4.5 U
Chrysene	700	4.6 U	NA	96 J	4.7 U	NA	NA	180	15 UJ	NA	67 J	NA	NA	410	7.4 J	NA	90	4.5 U
Benzo(b)fluoranthene	300	4.6 U	NA	46 J	4.7 U	NA	NA	150	15 UJ	NA	59 J	NA	NA	310	7.4 J	NA	54	4.5 U
Benzo(k)fluoranthene	300	4.6 U	NA	66 J	4.7 U	NA	NA	150	15 UJ	NA	59 J	NA	NA	330	5.1 J	NA	78	4.5 U
Benzo(a)pyrene**	**560**	4.6 U	NA	72 J	4.7 U	NA	NA	**150 J**	15 UJ	NA	65 J	NA	NA	**360**	6.9 J	NA	100	4.5 U
Indeno(1,2,3-cd)pyrene	200	4.6 U	NA	35	4.7 U	NA	NA	85	15 UJ	NA	38	NA	NA	230	4.6 UJ	NA	51	4.5 U
Dibenzo(a,h)anthracene	120	4.6 U	NA	15	4.7 U	NA	NA	32	15 UJ	NA	18 J	NA	NA	81	4.6 UJ	NA	26	4.5 U
TTEC**	**719**	NA	NA	95 J	NA	NA	NA	**206 J**	NA	NA	88 J	NA	NA	**493**	8.9 J	NA	128	NA
PCBs (ug/kg)																		
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	140	NA	NA	NA	NA	NA	390 J	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	200	NA	NA	NA	NA	NA	640 J	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	230	NA	NA	NA	NA	NA	340 J	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	5 U	NA	NA	5 U	NA	NA	NA	20	NA	NA	20	NA	NA	**100**	5 UJ	NA	5 UJ	NA
Arsenic**	17	NA	NA	5	NA	NA	NA	**200**	6 U	NA	**110**	5 U	NA	**350**	11	NA	10	NA
Beryllium	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.3 U	NA	NA	0.3 U	NA	NA	0.3 U	NA	NA	0.2	NA
Cadmium	0.3	NA	NA	0.2 U	NA	NA	NA	1.7	NA	NA	0.8	NA	NA	2.2	0.2 U	NA	0.2 UJ	NA
Chromium	24.8	NA	NA	19.0	NA	NA	NA	65	33.4	NA	58	19.1	NA	49	19.8	NA	23.1	NA
Copper**	78.4	8.1	NA	38.3	8.9	NA	NA	1,200	19.5	NA	334	7.4	NA	816	21.8 J	NA	22.6	NA
Lead**	71	NA	NA	28	NA	NA	NA	**294**	3	NA	167	NA	NA	**355**	8 J	NA	11 J	NA
Mercury	0.11	0.05 U	NA	0.16	0.05 U	NA	NA	0.76	0.06 J	NA	0.38	0.05 UJ	NA	2.25	0.09	0.05 UJ	0.04	NA
Nickel	26	NA	NA	23	NA	NA	NA	41	NA	NA	40	NA	NA	37	NA	NA	27	NA
Selenium	5 U	NA	NA	5 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	5 U	NA
Silver	0.3 U	NA	NA	0.3 U	NA	NA	NA	0.8 U	NA	NA	0.8 U	NA	NA	0.8 U	NA	NA	0.3 UJ	NA
Thallium	5 U	NA	NA	5 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	5 U	NA
Zinc	105	35	NA	45	NA	NA	NA	2,180	43	NA	924	23	NA	1,100	36	NA	48	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-14	SB-14	SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-17	SB-17	SB-18	SB-18	SB-18	SB-19	SB-19	SB-19	SB-19	SB-20
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	5 - 6	9 - 10	0 - 0.5	1 - 2	3 - 4	0 - 0.5	1 - 2	3 - 4	4 - 5	0 - 0.5
Date Collected:	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Field QC:																		
TPH (mg/kg)																		
Diesel-range**	6.0	NA	5.1 U	5.2 UJ	25	NA	43	NA	21	6.1 U	5.0 U	NA	6.2 U	7.0	NA	10	6.5 U	5.0 U
Oil-range**	25	NA	13	10 UJ	64	NA	190	NA	11 U	12 U	14	NA	12 U	26	NA	19	13 U	10 U
cPAHs (ug/kg)																		
Benzo(a)anthracene	8.6	NA	61	4.7 U	20	NA	200	4.7 UJ	NA	NA	17	NA	4.6 U	15	NA	4.8 U	NA	6.1
Chrysene	14	NA	93	4.7 U	23	NA	440	4.7 UJ	NA	NA	23	NA	4.6 U	19	NA	4.8 U	NA	7.5
Benzo(b)fluoranthene	9.1	NA	57	4.7 U	13	NA	460	4.7 UJ	NA	NA	14	NA	4.6 U	11	NA	4.8 U	NA	4.4
Benzo(k)fluoranthene	14	NA	57	4.7 U	14	NA	300	4.7 UJ	NA	NA	14	NA	4.6 U	11	NA	4.8 U	NA	4.4
Benzo(a)pyrene**	12	NA	100	4.7 U	19	NA	**320**	4.7 UJ	NA	NA	19	NA	4.6 U	16	NA	4.8 U	NA	6.6
Indeno(1,2,3-cd)pyrene	8.2	NA	52	4.7 U	9.3	NA	130	4.7 UJ	NA	NA	10	NA	4.6 U	7.8	NA	4.8 U	NA	4.4 U
Dibenzo(a,h)anthracene	4.8 U	NA	23	4.7 U	4.9 U	NA	51	4.7 UJ	NA	NA	4.8	NA	4.6 U	4.9 U	NA	4.8 U	NA	4.4 U
TTEC**	16	NA	126	NA	25	NA	**439**	NA	NA	NA	25	NA	NA	21	NA	NA	NA	8.2
PCBs (ug/kg)																		
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	4.9 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	7.0 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	5.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	5 UJ	NA	5 UJ	5 UJ	5 U	NA	5 U	NA	NA	NA	5 UJ	NA	6 UJ	5 UJ	NA	7 UJ	NA	5 UJ
Arsenic**	6	NA	5 U	5 U	7	NA	12	NA	NA	NA	5 UJ	NA	6 UJ	6 J	NA	7 UJ	NA	5 UJ
Beryllium	0.1	NA	0.1	0.1 U	0.1	NA	0.1	NA	NA	NA	0.1	NA	0.2	0.1	NA	0.2	NA	0.1
Cadmium	0.2 UJ	NA	0.2 UJ	0.2 U	0.2	NA	0.5	NA	NA	NA	0.2 U	NA	0.3	0.2	NA	0.3	NA	0.2 U
Chromium	22.3	NA	21.7	19.4 J	24.6	NA	29.2	NA	NA	NA	22.7	NA	30.1	23.7	NA	34.5	NA	21.4
Copper**	33.5	NA	10.7	7.1	50.8	9.0 J	71.2	8.0 J	NA	NA	57.5	7.5	19.6	424	8.5	45.0	14.5	12.5
Lead**	31 J	NA	5 J	2 U	24	NA	69	NA	NA	NA	21 J	NA	4 J	**373 J**	2	23 J	NA	3 J
Mercury	0.07	0.04 UJ	0.04 U	0.05 U	0.29	0.05 U	0.15	0.04 U	NA	NA	0.09	0.05 UJ	0.05	0.07	0.05 UJ	0.07	0.06 UJ	0.06
Nickel	27	NA	26	18 J	22	NA	29	NA	NA	NA	23	NA	41	21	NA	35	NA	20
Selenium	5 U	NA	5 U	5 U	5 U	NA	5 U	NA	NA	NA	5 U	NA	6 U	5 U	NA	7 U	NA	5 U
Silver	0.3 UJ	NA	0.3 UJ	0.3 U	0.3 U	NA	0.3 U	NA	NA	NA	0.3 U	NA	0.4 U	0.3 U	NA	0.4 U	NA	0.3 U
Thallium	5 U	NA	5 U	5 U	5 U	NA	5 U	NA	NA	NA	5 U	NA	6 U	5 U	NA	7 U	NA	5 U
Zinc	79	NA	28	21 J	68	NA	187	23	NA	NA	53	NA	39	54	NA	45	NA	28

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-21	SB-21	SB-22	SB-22	SB-23	SB-23	SB-24	SB-24	SB-24	SB-25	SB-25	SB-25	SB-26	SB-26	SB-26	SB-27
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	0 - 0.5	1 - 2	1 - 2	2 - 3	1 - 2	2 - 3	3 - 4	1 - 2	2 - 3	3 - 4	0 - 0.5	1 - 2	2 - 3	0 - 0.5
Date Collected:	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/1/2008	12/1/2008	1/6/2009	1/6/2009	1/6/2009	1/21/2009	1/21/2009	1/21/2009	12/11/2008	12/11/2008	12/11/2008	12/4/2008
Field QC:																
TPH (mg/kg)																
Diesel-range**	5.6 U	NA	5.8 U	NA	NA	NA	570	99	140	NA	NA	10	**3,500**	6.9 UJ	NA	5.5 U
Oil-range**	14	NA	12 U	NA	NA	NA	**2,500**	240	110	NA	NA	13 U	**2,100**	14 UJ	NA	14
cPAHs (ug/kg)																
Benzo(a)anthracene	11	NA	4.8 U	NA	68 U	60 U	2,000 J	63 U	NA	65 U	65 U	NA	4,400	4.6 UJ	NA	4.6 U
Chrysene	15	NA	4.8 U	NA	290	60 U	2,700 J	63 U	NA	65 U	65 U	NA	6,400	4.6 UJ	NA	4.6 U
Benzo(b)fluoranthene	8.4	NA	4.8 U	NA	100	60 U	3,000 J	63 U	NA	65 U	65 U	NA	3,800	4.6 UJ	NA	4.6 U
Benzo(k)fluoranthene	7.0	NA	4.8 U	NA	110	60 U	2,500 J	63 U	NA	65 U	65 U	NA	3,800 J	4.6 UJ	NA	4.6 U
Benzo(a)pyrene**	7.9	NA	4.8 U	NA	68 U	60 U	**3,000 J**	63 U	NA	65 U	65 U	NA	**2,200 J**	4.6 UJ	NA	4.6 U
Indeno(1,2,3-cd)pyrene	5.1	NA	4.8 U	NA	68 U	60 U	810 J	63 U	NA	65 U	65 U	NA	1,600	4.6 UJ	NA	4.6 U
Dibenzo(a,h)anthracene	4.7 U	NA	4.8 U	NA	68 U	60 U	320 J	63 U	NA	65 U	65 U	NA	680	4.6 UJ	NA	4.6 U
TTEC**	11	NA	NA	NA	24	NA	**3,890 J**	NA	NA	NA	NA	NA	**3,692 J**	NA	NA	NA
PCBs (ug/kg)																
Aroclor 1016	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1242	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1248	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	1,100 UJ	31 UJ	NA	NA
Aroclor 1254**	NA	NA	NA	NA	80	32 U	**9,200 J**	1,200	180	**5,800**	32 U	NA	**2,500 J**	31 UJ	NA	NA
Aroclor 1260	NA	NA	NA	NA	45	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	930 J	31 UJ	NA	NA
Aroclor 1221	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Aroclor 1232	NA	NA	NA	NA	30 U	32 U	1,300 UJ	160 U	32 U	940 U	32 U	NA	310 UJ	31 UJ	NA	NA
Total PCBs**	NA	NA	NA	NA	125	NA	**9,200 J**	**1,200**	180	**5,800**	NA	NA	**3,430 J**	NA	NA	NA
Organotins (ug/kg)																
Tributyltin as TBT Ion	NA	NA	3.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,500	NA	NA	NA
Dibutyl Tin Ion	NA	NA	5.4 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,800	NA	NA	NA
Butyl Tin Ion	NA	NA	3.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,200	NA	NA	NA
Metals (mg/kg)																
Antimony**	6 UJ	NA	6 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	**70**	6 U	7 U	6 UJ
Arsenic**	6 U	NA	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	**320**	6 U	7 U	6 J
Beryllium	0.1	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3 U	NA	NA	0.1 U
Cadmium	0.2 U	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8	0.3	0.3 U	0.2 U
Chromium	24.5	NA	27.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	152	29.4	30.8	27.7
Copper**	23.6	NA	18.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4,560**	19.8	21.4	17.5
Lead**	8	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	**775**	3	4	5 J
Mercury	0.12	0.05 UJ	0.09	0.06 UJ	NA	NA	NA	NA	NA	NA	NA	NA	22	0.06 J	0.07 J	0.05 U
Nickel	21	NA	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	NA	NA	23
Selenium	6 U	NA	6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA	6 U
Silver	0.3 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U	NA	NA	0.4 U
Thallium	6 U	NA	6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA	6 U
Zinc	44	NA	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,720	42	39	36

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-28		SB-28	SB-28	SB-29	SB-29	SB-29	SB-29	SB-30	SB-30		SB-30	SB-31	SB-31	SB-32	SB-32	SB-33	SB-33	SB-34
Sample ID Depth Interval (feet bgs):	0 - 0.5		1 - 2	4 - 5	0 - 0.5	1 - 2	2 - 3	4 - 5	0 - 0.5	1 - 2		2 - 3	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5
Date Collected:	12/4/2008		12/1/2008	12/4/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008		12/3/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/2/2008	12/2/2008	12/11/2008
Field QC:		Field Duplicate									Field Duplicate								
TPH (mg/kg)																			
Diesel-range**	29	33	NA	NA	20	NA	9.2	NA	120	NA	NA	6.0 U	14	NA	320	NA	5.6 U	5.4 U	19
Oil-range**	140	150	NA	NA	60	NA	16	NA	310	NA	NA	12 U	38	NA	1,600	NA	11 U	11 U	54
cPAHs (ug/kg)																			
Benzo(a)anthracene	21	30	NA	NA	110	4.7 UJ	4.8 U	NA	2,200	6.4 J	NA	4.8 U	330	26	210	4.7 U	4.6 U	NA	53
Chrysene	50	64	NA	NA	120	4.7 UJ	4.8 U	NA	2,300	7.4 J	NA	4.8 U	420	44	300	4.7 U	4.6 U	NA	61
Benzo(b)fluoranthene	31	42	NA	NA	110	4.7 UJ	4.8 U	NA	2,200	6.4 J	NA	4.8 U	200	23	250	4.7 U	4.6 U	NA	26
Benzo(k)fluoranthene	31	42	NA	NA	110	4.7 UJ	4.8 U	NA	2,000	5.9 J	NA	4.8 U	200	27	260	4.7 U	4.6 U	NA	19
Benzo(a)pyrene**	29	32	NA	NA	110	4.7 UJ	4.8 U	NA	**1,800**	6.4 J	NA	4.8 U	**360**	30	**300**	4.7 U	4.6 U	NA	17 J
Indeno(1,2,3-cd)pyrene	19 U	28	NA	NA	52	4.7 UJ	4.8 U	NA	660	4.9 UJ	NA	4.8 U	170	17	150	4.7 U	4.6 U	NA	5.1
Dibenzo(a,h)anthracene	19 U	21 U	NA	NA	19	4.7 UJ	4.8 U	NA	230	4.9 UJ	NA	4.8 U	88	8.2	60	4.7 U	4.6 U	NA	4.7 U
TTEC**	38	47	NA	NA	**151**	NA	NA	NA	**2,552**	8.3 J	NA	NA	**463**	41	**396**	NA	NA	NA	28 J
PCBs (ug/kg)																			
Aroclor 1016	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	31 U	NA	NA	NA	220	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	36	NA	NA	NA	760	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	31 U	NA	NA	NA	500	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	31 U	NA	NA	NA	160 U	31 U	NA	NA	NA	NA	29 U	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	36	NA	NA	NA	**1,480**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	3.2 U	3.1 U	3.4 U	NA	270	NA	NA	NA	2,700	NA	NA	NA	NA	NA	NA	NA	3.6 U	NA	NA
Dibutyl Tin Ion	4.8 U	4.6 U	5.0 U	NA	75	NA	NA	NA	1,600	NA	NA	NA	NA	NA	NA	NA	5.4 U	NA	NA
Butyl Tin Ion	6.2	5.6	3.5 U	NA	52	NA	NA	NA	1,100	NA	NA	NA	NA	NA	NA	NA	3.8 U	NA	NA
Metals (mg/kg)																			
Antimony**	5 UJ	5 UJ	5 U	NA	5 U	NA	6 U	NA	**80**	6 UJ	6 UJ	6 U	5 UJ	NA	5 UJ	NA	5 UJ	NA	5 U
Arsenic**	6 J	6 J	5 U	NA	**33**	6	6 U	NA	**390**	17	8	6 U	12	NA	5 U	NA	5 U	NA	7
Beryllium	0.1	0.1	0.1	NA	0.1	NA	0.2	NA	0.3	NA	NA	0.2	0.1	NA	0.1	NA	0.1	NA	0.1
Cadmium	0.5	0.6	0.2 U	NA	0.3	NA	0.2 U	NA	2.6	0.3	0.2 U	0.3 U	0.2 UJ	NA	0.2 UJ	NA	0.2 U	NA	0.2 U
Chromium	26.5	28.2	20.3	NA	25.9	NA	28.5	NA	66	27.6	26.4	27.0	27.7	NA	21.8	NA	22.6	NA	27.0
Copper**	99.4	165	8.6	NA	79.6	13.3 J	15.7	NA	1,420	39.4 J	22.9 J	17.1	35.7	11.3	23.0	NA	19.0	NA	32.6
Lead**	82 J	138 J	3	NA	31	NA	3	NA	**552**	13 J	6 J	4	27 J	NA	53 J	NA	13	NA	16
Mercury	0.54	0.66	0.04 U	NA	0.37	0.04 U	0.06 U	NA	5.08	0.11	0.06	0.06 U	0.05	NA	0.05	NA	0.11	0.04 UJ	0.20
Nickel	27	32	23	NA	21	NA	109	30	30	NA	NA	38	30	NA	27	NA	21	NA	27
Selenium	5 U	5 U	5 U	NA	5 U	NA	6 U	NA	10 U	NA	NA	6 U	5 U	NA	5 U	NA	5 U	NA	5 U
Silver	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA	0.4 U	NA	**1.0**	0.3 U	0.4 U	0.4 U	0.3 UJ	NA	0.3 UJ	NA	0.3 U	NA	0.3 U
Thallium	5 U	5 U	5 U	NA	5 U	NA	6 U	NA	10 U	NA	NA	6 U	5 U	NA	5 U	NA	5 U	NA	5 U
Zinc	102	117	30	NA	129	28	38	NA	1,520	50	39	44	77	NA	47	NA	38	NA	60

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-35	SB-35	SB-35	SB-36	SB-36	SB-36	SB-37	SB-38	SB-39	SB-39	SB-40	SB-40	SB-40	SB-41	SB-42	SB-42	SB-42	SB-43	SB-43
Sample ID Depth Interval (feet bgs):	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	1 - 2	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5	1 - 2	2 - 3	1 - 2	2 - 3
Date Collected:	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/1/2008	12/1/2008	12/1/2008	10/28/2009	10/28/2009
Field QC:		Field Duplicate								Field Duplicate		Field Duplicate							
TPH (mg/kg)																			
Diesel-range**	71	62	140	210	140	NA	5.6 U	5.3 U	5.3 U	5.2 U	5.0 U	5.2 U	NA	6.7 U	350 J	NA	NA	NA	NA
Oil-range**	68	53	360	520	330	NA	11 U	13	13	12	10 U	12	NA	13 U	420 J	NA	NA	NA	NA
cPAHs (ug/kg)																			
Benzo(a)anthracene	52	56	8.5	290	440	110	4.6 U	4.8 U	4.8 U	4.7 U	52	39	4.8 U	4.7 U	5,000	550	4.6 UJ	32	NA
Chrysene	51	58	7.6	400	490	110	4.6	4.8 U	4.8 U	4.7 U	67	51	4.8 U	4.7 U	6,900	800	4.6 UJ	44	NA
Benzo(b)fluoranthene	18	21	4.7 U	190	170	57	4.6 U	4.8 U	4.8 U	4.7 U	37	33	4.8 U	4.7 U	2,300	360	4.6 UJ	22	NA
Benzo(k)fluoranthene	18	19	4.7 U	200	110	34	4.6 U	4.8 U	4.8 U	4.7 U	54	39	4.8 U	4.7 U	2,700	360	4.6 UJ	31	NA
Benzo(a)pyrene**	16	21	4.7 U	140	**190**	40	4.6 U	4.8 U	4.8 U	4.7 U	74	60	4.8 U	4.7 U	**3,400**	**610**	4.6 UJ	24	NA
Indeno(1,2,3-cd)pyrene	6.3	7.9	4.7 U	75	25	24	4.6 U	4.8 U	4.8 U	4.7 U	38	33	4.8 U	4.7 U	1,400	310	4.6 UJ	18	NA
Dibenzo(a,h)anthracene	4.5 U	4.7	4.7 U	34	17	8.4	4.6 U	4.8 U	4.8 U	4.7 U	17	14	4.8 U	4.7 U	830	170	4.6 UJ	8.2	NA
TTEC**	26	32	0.9	**223**	**267**	64	0.05	NA	NA	NA	94	76	NA	NA	**4,692**	**793**	NA	36	NA
PCBs (ug/kg)																			
Aroclor 1016	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Aroclor 1242	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Aroclor 1248	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Aroclor 1254**	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Aroclor 1260	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Aroclor 1221	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	64 UJ	NA	NA	NA	NA
Aroclor 1232	NA	NA	33 U	NA	33 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	32 U	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	NA	NA	NA	420	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																			
Antimony**	6 UJ	6 UJ	NA	6 UJ	NA	NA	6 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U	NA	6 U	5 UJ	NA	NA	9 J	NA
Arsenic**	6 U	6 U	NA	12	NA	NA	6 U	5 U	5 U	5 U	5 U	5 U	NA	6 U	5 U	NA	NA	**38 J**	**46 J**
Beryllium	0.2	0.2	NA	0.2	NA	NA	0.1	0.1	0.2	0.2	0.1 U	0.1 U	NA	0.1 U	0.1	NA	NA	NA	NA
Cadmium	0.2 U	0.2 U	NA	0.4	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3 U	0.2 UJ	NA	NA	0.4	NA
Chromium	27.9	29.5	NA	35.7	NA	NA	27.5	26.0	36.8	37.8	18.5	21.6	NA	20.2	28.7	NA	NA	23.4	NA
Copper**	42.1	33.1	16.4 J	95.5	29.3 J	NA	16.0	12.6	18.0	18.0	8.0	8.6	NA	6.9	32.4	NA	NA	121	82.9 J
Lead**	7	7	NA	24	NA	NA	4	4	4	4	4	5	NA	3 U	14 J	NA	NA	67 J	NA
Mercury	0.07	0.08	0.05 UJ	0.14	0.09 J	0.07 J	0.05	0.05 U	0.04 U	0.05 U	0.04 U	0.04 U	NA	0.06 U	0.06	NA	NA	0.55 J	NA
Nickel	33	34	NA	39	NA	NA	23	24	44	47	21	20	NA	22	32	NA	NA	25	NA
Selenium	6 U	6 U	NA	6 U	NA	NA	6 U	5 U	5 U	5 U	5 U	5 U	NA	6 U	5 U	NA	NA	NA	NA
Silver	0.4 U	0.3 U	NA	0.3 U	NA	NA	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	NA	0.4 U	0.3 UJ	NA	NA	0.3 U	NA
Thallium	6 U	6 U	NA	6 U	NA	NA	6 U	5 U	5 U	5 U	5 U	5 U	NA	6 U	5 U	NA	NA	NA	NA
Zinc	40	43	NA	117	57	NA	34	31	37	39	22	25	NA	23	66	NA	NA	311 J	188

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-44	SB-45	SB-46	SB-47	SB-48		SB-48	SB-49	SB-49	SB-50	SB-51	SB-52	SB-53	SB-53	SB-54	SB-54	SB-55		SB-55
Sample ID Depth Interval (feet bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5		2 - 3	0 - 0.5	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5		2 - 3
Date Collected:	10/27/2009	10/27/2009	10/27/2009	10/27/2009	11/25/2009		11/25/2009	11/25/2009	11/25/2009	11/25/2009	11/25/2009	11/25/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009		10/30/2009
Field QC:						Field Duplicate												Field Duplicate	
TPH (mg/kg)																			
Diesel-range**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.9 U	NA	6.1 U	NA	NA	NA	NA
Oil-range**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12 U	NA	22	NA	NA	NA	NA
cPAHs (ug/kg)																			
Benzo(a)anthracene	4.6 U	4.9 U	5.0 U	5.0 U	180	220	5.0 U	63	NA	18	4.6 U	8.7	8.4	NA	130	15	62	73	NA
Chrysene	4.6 U	4.9 U	5.0 U	5.0 U	250	330	5.0 U	71	NA	25	6.9 J	14	14	NA	160	18	120	140	NA
Benzo(b)fluoranthene	4.6 U	4.9 U	5.0 U	5.0 U	230	290	5.0 U	56	NA	20	4.6 J	8.7	7.9	NA	160	20	44	54	NA
Benzo(k)fluoranthene	4.6 U	4.9 U	5.0 U	5.0 U	230	290	5.0 U	56	NA	20	4.6	8.7	7.9	NA	110	20	44	54	NA
Benzo(a)pyrene**	4.6 U	4.9 U	5.0 U	5.0 U	**280**	**320**	5.0 U	65	NA	29	4.6 J	12	11	NA	140	20	41	50	NA
Indeno(1,2,3-cd)pyrene	4.6 U	4.9 U	5.0 U	5.0 U	130	170	5.0 U	30	NA	14	5.1 J	4.6 U	7.4	NA	86	20	35	52	NA
Dibenzo(a,h)anthracene	4.6 U	4.9 U	5.0 U	5.0 U	59	74	5.0 U	18	NA	4.7 U	4.6 U	4.6 U	5 U	NA	40	4.6	15	22	NA
TTEC**	NA	NA	NA	NA	**365**	**428**	NA	88	NA	36	6.1	15	14	NA	**194**	28	62	77	NA
PCBs (ug/kg)																			
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	42 J	NA	540 UJ	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	39 J	NA	NA	31 UJ	32 UJ	NA	NA	34 J	NA	1,500 J	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	160 UJ	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	31 UJ	NA	NA	31 UJ	32 UJ	NA	NA	33 UJ	NA	54 UJ	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	39 J	NA	NA	NA	NA	NA	NA	76 J	NA	**1,500 J**	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																			
Antimony**	5 UJ	5 UJ	5 UJ	5 UJ	6 UJ	8 J	NA	5 UJ	NA	6 UJ	5 UJ	5 UJ	6 UJ	NA	6 UJ	NA	5 UJ	5 UJ	NA
Arsenic**	5 U	6	5	6	**40**	**60**	5	**30**	6	8	5 U	5 U	8	NA	8	NA	**30**	**24**	4.2
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.2 U	0.2 U	0.2 U	0.2 U	1.4	1.8	NA	0.6	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3	NA	0.9	0.8	NA
Chromium	23.3	22.1	20.3	20	31	38.9	NA	33.8	NA	25.4	28	24.6	24.2	NA	25.8	NA	40.2	37.4	NA
Copper**	9.7	8.5	6.8	6.8	413	489	9.5	104	8.3	26.7	23.5	19.3	40.6 J	14.8	62.4 J	12	426 J	459 J	8.9
Lead**	2 U	2 U	2 U	2 U	112	145	NA	82	NA	14	8	7	14	NA	24	NA	**350**	**351**	2
Mercury	0.03 U	0.02	0.02 U	0.02 U	0.14	0.12	NA	0.18	NA	0.05	0.03 U	0.03	0.03 J	NA	0.06 J	NA	5.9 J	7.6 J	NA
Nickel	22	21	20	22	30	34	NA	34	NA	28	29	30	20	NA	25	NA	21	20	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA	0.3 U	0.3 U	0.3 U	0.3 U	NA	0.4 U	NA	0.3 U	0.3	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	28	26	23	25	616	906	28	210	24	75	46	40	139 J	40	238 J	27	277 J	257 J	27

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-56	SB-57	SB-58	SB-59	SB-59	SB-60	SB-60	SB-61	SB-61	SB-62	SB-62	SB-62	SB-62	SB-62	SB-63	SB-63	SB-64	SB-64	SB-64
Sample ID Depth Interval (feet bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3	SS	0 - 0.5	0 - 0.5	2 - 3	2 - 3	SS	0 - 0.5	SS	0 - 0.5	2 - 3
Date Collected:	10/27/2009	10/27/2009	10/29/2009	10/29/2009	10/29/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/30/2009	10/29/2009	10/29/2009	10/29/2009
Field QC:					Field Duplicate							Field Duplicate		Field Duplicate					
TPH (mg/kg)																			
Diesel-range**	NA	NA	NA	NA	NA	5.8	NA	7.9	NA	NA	5.4 U	5.4 U	43 J	18 J	NA	5.7 U	NA	5.4 U	NA
Oil-range**	NA	NA	NA	NA	NA	21	NA	25	NA	NA	11 U	11 U	560 J	220 J	NA	11 U	NA	21	NA
cPAHs (ug/kg)																			
Benzo(a)anthracene	4.7 U	38	6.8	4.5 U	4.6 U	24	NA	700	4.8 U	110 J	4.8 U	4.8 U	18	17	210 J	29	51 J	75	4.8 U
Chrysene	4.7 U	47	12	4.5 U	4.6 U	35	NA	870	4.8 U	160 J	5.3	6.3	44	32	250 J	40	95 J	130	4.8 U
Benzo(b)fluoranthene	4.7 U	26	6.8	4.5 U	4.6 U	22	NA	380	4.8 U	100 J	4.8 U	5.3	20 J	17 J	310 J	20	42 J	74	4.8 U
Benzo(k)fluoranthene	4.7 U	22	6.8	4.5 U	4.6 U	19	NA	360	4.8 U	120 J	4.8 U	5.3	20 J	17 J	280 J	20	42 J	58	4.8 U
Benzo(a)pyrene**	4.7 U	39	9.6	4.5 U	4.6 U	23	NA	**570**	4.8 U	110 J	4.8 U	5.3	27 J	20 J	**360 J**	34	58 J	85	4.8 U
Indeno(1,2,3-cd)pyrene	4.7 U	17	7.3	4.5 U	4.6 U	15	NA	220	4.8 U	74 J	4.8 U	4.8 U	16	15	220 J	18	31 J	46	4.8 U
Dibenzo(a,h)anthracene	4.7 U	5.1	4.6 U	4.5 U	4.6 U	5.8	NA	110	4.8 U	31 J	4.8 U	4.8 U	15 U	14 U	72 J	5.2	14 J	21	4.8 U
TTEC**	NA	50	12	NA	NA	32	NA	**756**	NA	**155**	0.05	6.4	35	27	**472**	44	77	114	NA
PCBs (ug/kg)																			
Aroclor 1016	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	31 UJ	32 UJ	NA	NA	NA	NA	NA	34 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	31 UJ	32 UJ	NA	NA	NA	NA	NA	32 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	34 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																			
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA		NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA		NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA		NA	NA
Metals (mg/kg)																			
Antimony**	5 UJ	5 UJ	5 UJ	5 UJ	6 UJ	6 UJ	NA	6 UJ	NA	NA	5 UJ	5 UJ	6 UJ	6 UJ	NA	5 UJ	NA	5 UJ	NA
Arsenic**	5 U	10	5 U	6	6	8	NA	7	NA	NA	6	6	11	11	NA	7	NA	8	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2	NA	0.2 U	NA	NA	0.2 U	0.2 U	0.3	0.4	NA	0.2 U	NA	0.2 U	NA
Chromium	24.7	24.4	14.5	23.3	22.4	27.1	NA	23.6	NA	NA	29.4	48.5	32.8	40.6	NA	24.6	NA	22.4	NA
Copper**	11.3	13.7	24	8.7	10.1	42.8 J	23.1	53 J	11.7	NA	29.9 J	29.8 J	90.8 J	100 J	NA	13.8 J	NA	26	NA
Lead**	2 U	4	95	2 U	2	18	NA	10	NA	NA	7	6	142	100	NA	12	NA	43	NA
Mercury	0.03	0.05	0.13	0.02 U	0.02 U	0.1 J	NA	0.1 J	NA	NA	0.04 J	0.03 J	0.17 J	0.29 J	NA	0.04 J	NA	0.05	NA
Nickel	21	23	17	24	24	23	NA	20	NA	NA	44	41	29	30	NA	24	NA	22	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA	NA	0.3 U	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA	0.3 U	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	31	31	59	30	30	93 J	NA	96 J	NA	NA	45 J	51 J	116 J	115 J	NA	36 J	NA	59	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-65	SB-65	SB-65	SB-66	SB-66	SB-66	SB-67	SB-67	SB-67	SB-68	SB-68	SB-69	SB-69	SB-69	SB-70	SB-70	SB-71	SB-71	SB-72	SB-72
Sample ID Depth Interval (feet bgs):	SS	0 - 0.5	2 - 3	SS	0 - 0.5	2 - 3	SS	0 - 0.5	2 - 3	SS	0 - 0.5	SS	0 - 0.5	2 - 3	SS	0 - 0.5	SS	2 - 3	0 - 0.5	2 - 3
Date Collected:	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/27/2009	10/27/2009
Field QC:																				
TPH (mg/kg)																				
Diesel-range**	NA	5.4 U	NA	5.5 U	5.5 U	NA	NA	72	NA	NA	21	5.1 U	19	NA	NA	16	5.3 U	5.2 U	6.5	NA
Oil-range**	NA	12	NA	17	17	NA	NA	72	NA	NA	70	10 U	81	NA	NA	160	12	10 U	14	NA
cPAHs (ug/kg)																				
Benzo(a)anthracene	4.8 U	93	4.8 U	12 J	42	NA	13 J	49	NA	740 J	13	4.7 U	150	4.8	54 J	18	8.1	NA	270	4.8 U
Chrysene	4.8 U	160	5.3	21 J	67	NA	28 J	84	NA	880 J	22	4.7 U	270	5.3	85 J	30	13	NA	410	4.8 U
Benzo(b)fluoranthene	4.8 U	76	4.8 U	10 J	35	NA	16 J	44	NA	650 J	11	4.7 U	110	4.8 U	44 J	11	5.7	NA	220	4.8 U
Benzo(k)fluoranthene	4.8 U	72	4.8 U	10 J	35	NA	16 J	44	NA	650 J	11	4.7 U	140	4.8 U	44 J	11	5.7	NA	200	4.8 U
Benzo(a)pyrene**	4.8 U	110	4.8 U	15 J	51	NA	20 J	44	NA	**860 J**	17	4.7 U	**180**	4.8 U	69 J	20	9.5	NA	**320**	4.8 U
Indeno(1,2,3-cd)pyrene	4.8 U	52	4.8 U	8.1 J	28	NA	14 J	30	NA	480 J	11	4.7 U	85	4.8 U	34 J	10	6.2	NA	150	4.8 U
Dibenzo(a,h)anthracene	4.8 U	26	4.8 U	4.8 UJ	14	NA	7.2 UJ	12	NA	240 J	4.8 U	4.7 U	38	4.8 U	11 J	7.1	4.8 U	NA	73	4.8 U
TTEC**	NA	**144**	0.05	19	67	NA	26	63	NA	**1,145**	22	NA	**235**	0.5	89	26	12	NA	**415**	NA
PCBs (ug/kg)																				
Aroclor 1016	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	47 J	42 J	NA	270 UJ	33 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	61 J	67 J	NA	800 J	71 J	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	64 J	48 UJ	NA	210 UJ	49 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	32 UJ	32 UJ	NA	43 UJ	33 UJ	NA	NA	NA	NA	NA	NA	NA	33 UJ	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	172 J	109 J	NA	800 J	71 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																				
Tributyltin as TBT Ion	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
Metals (mg/kg)																				
Antimony**	NA	5 UJ	NA	NA	5 UJ	NA	NA	5 UJ	NA	NA	5 UJ	NA	5 UJ	NA	NA	5 UJ	5 UJ	NA	10 J	NA
Arsenic**	NA	7	NA	NA	7	NA	NA	10	NA	NA	7 J	NA	8 J	NA	NA	5 UJ	8 J	NA	7	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	0.2 U	NA	NA	0.2	NA	NA	0.4	NA	NA	0.2 U	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA	1	NA
Chromium	NA	22.5	NA	NA	27.6	NA	NA	40	NA	NA	32.8	NA	23.4	NA	NA	15.3	22.6	NA	26.5	NA
Copper**	NA	24	NA	NA	72.1	8.6	NA	302	12.4	NA	22.7	NA	141	10.2 J	NA	11.1	8.9	NA	191	13.9
Lead**	NA	20	NA	NA	89	NA	NA	**382**	NA	NA	15 J	NA	59 J	NA	NA	11 J	5 J	NA	**4,630**	2 U
Mercury	NA	0.25	NA	NA	0.28	NA	NA	0.85	NA	NA	0.04 J	NA	0.44 J	NA	NA	0.03 J	0.02 UJ	NA	0.05	NA
Nickel	NA	25	NA	NA	26	NA	NA	25	NA	NA	34	NA	27	NA	NA	18	26	NA	24	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	0.3 U	NA	NA	0.3 U	NA	NA	0.3 U	NA	NA	0.3 U	NA	0.3 U	NA	NA	0.3 U	0.3 U	NA	0.3 U	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	44	NA	NA	104	26	NA	329	29	NA	47 J	NA	87 J	NA	NA	34 J	28 J	NA	312	30

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-73	SB-73	SB-73	SB-74	SB-74	SB-75	SB-75	SB-76	SB-76	SB-77	SB-77	SB-78	SB-78	SB-79	SB-79	SB-79	SB-80	SB-80
Sample ID Depth Interval (feet bgs):	SS	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3
Date Collected:	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	10/26/2009	10/26/2009
Field QC:															Field Duplicate			
TPH (mg/kg)																		
Diesel-range**	NA	410	5.8 U	1,100	**2,100**	240	NA	70	NA	44	NA	74	NA	86	92	NA	NA	NA
Oil-range**	NA	**4,500**	12 U	**11,000**	**25,000**	540	NA	270	NA	75	NA	330	NA	260	270	NA	NA	NA
PAHs (ug/kg)																		
Benzo(a)anthracene	62 J	26 U	NA	50 U	NA	410	5.7	160	7.1	82	37	350	98	630 J	290 J	4.8 U	700	4.7 U
Chrysene	120 J	26 U	NA	50 U	NA	780	8.1	210	9	120	56	440	110	830 J	390 J	4.8 U	840	4.7 U
Benzo(b)fluoranthene	51 J	26 U	NA	50 U	NA	1400	5.2	150	5.7	50	28	300	63	340 J	230 J	4.8 U	450	4.7 U
Benzo(k)fluoranthene	51 J	26 U	NA	50 U	NA	1000	5.2	140	5.7	66	28	310	63	380 J	210 J	4.8 U	450	4.7 U
Benzo(a)pyrene**	66 J	26 U	NA	50 U	NA	**1,000**	7.1	**170**	9	82	42	**350**	100	**630 J**	**300 J**	4.8 U	**730**	4.7 U
Indeno(1,2,3-cd)pyrene	36 UJ	26 U	NA	50 U	NA	1000	4.8 U	120	5.7	47	20	230	47	280 J	170 J	4.8 U	330	4.7 U
Dibenzo(a,h)anthracene	36 UJ	26 U	NA	50 U	NA	290	4.8 U	48	4.8 U	23	8.1	100	20	150 J	88 J	4.8 U	140	4.7 U
TTEC**	84	NA	NA	NA	NA	**1,418**	8.8	**234**	12	110	55	**483**	130	**816**	**403**	NA	**945**	NA
PCBs (ug/kg)																		
Aroclor 1016	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ	1,800 UJ	32 UJ
Aroclor 1242	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ	1,800 UJ	32 UJ
Aroclor 1248	38 J	40 UJ	NA	150 J	31 UJ	530 UJ	31 UJ	490 J	31 UJ	34,000 J	180 J	6,800 J	300 UJ	10,000 J	8,200 J	32 UJ	43,000 J	32 UJ
Aroclor 1254**	68 J	49 J	NA	110 J	31 UJ	**1,900 J**	31 UJ	670 J	31 UJ	**17,000 J**	73 J	**7,700 J**	520 J	**9,500 J**	**7,700 J**	32 UJ	**25,000 J**	32 UJ
Aroclor 1260	66 J	50 J	NA	66 J	31 UJ	1,700 J	31 UJ	400 J	31 UJ	6,500 J	31 UJ	2,600 J	300 UJ	3,800 J	3,200 J	32 UJ	6,900 J	32 UJ
Aroclor 1221	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ	1,800 UJ	32 UJ
Aroclor 1232	32 UJ	32 UJ	NA	31 UJ	31 UJ	110 UJ	31 UJ	43 UJ	31 UJ	1,800 UJ	31 UJ	1,700 UJ	99 UJ	1,700 UJ	1,700 UJ	32 UJ	1,800 UJ	32 UJ
Total PCBs**	172 J	99 J	NA	326 J	NA	**3,600 J**	NA	**1,560 J**	NA	**57,500 J**	253 J	**17,100 J**	520 J	**23,300 J**	**19,100 J**	NA	**74,900 J**	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	NA	5 UJ	NA	5 UJ	NA	**70 J**	6 UJ	20 J	NA	12 J	NA	20 J	NA	6 J	11 J	NA	9 J	NA
Arsenic**	NA	6 J	NA	6 J	NA	**450 J**	7	**170 J**	8	**79 J**	7	**200 J**	10	**49 J**	**86 J**	6	**45**	6 U
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	0.2 U	NA	0.2 U	NA	3	NA	1	NA	0.3	NA	1.1	NA	0.5	0.7	NA	0.5	NA
Chromium	NA	18.4	NA	16.9	NA	77	NA	38	NA	29.7	NA	63	NA	48.9	46.3	NA	35.1	NA
Copper**	NA	6.7	NA	9.5	NA	1,730	11.7 J	446	17.3 J	144	14.6 J	905	46.2 J	331	358	9.1 J	298	9.5
Lead**	NA	2 UJ	NA	4 J	NA	**690 J**	2 U	248 J	3	97 J	NA	**2,220 J**	13	157 J	188 J	NA	133	2 U
Mercury	NA	0.02 UJ	NA	0.02 UJ	NA	7 J	NA	1.39 J	NA	0.24 J	NA	1.2 J	NA	0.7 J	0.67 J	NA	0.96	NA
Nickel	NA	25	NA	21	NA	36	NA	28	NA	25	NA	39	NA	31	34	NA	30	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	0.3 U	NA	0.3 U	NA	2 U	NA	0.7 U	NA	0.3 U	NA	0.8 U	NA	0.3	0.3 U	NA	0.3 U	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	22 J	NA	23 J	NA	7,230 J	32	998 J	43	267 J	40	1,040 J	81	369 J	535 J	38	327	30

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-81	SB-81	SB-81	SB-82	SB-83	SB-84	SB-84	SB-85	SB-85	SB-86	SB-87	SB-88	SB-88	SB-88	SB-89	SB-89	SB-90
Sample ID Depth Interval (feet bgs):	0 - 0.5	1 - 2	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	2 - 3	0 - 0.5	2 - 3	0 - 0.5	0 - 0.5	SS	0 - 0.5	2 - 3	SS	0 - 0.5	0 - 0.5
Date Collected:	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/27/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009
Field QC:																	
TPH (mg/kg)																	
Diesel-range**	NA	27 J	NA	NA	NA	5.4 U	NA	5.4 U	NA	5.3 U	NA	NA	NA	NA	NA	NA	NA
Oil-range**	NA	76	NA	NA	NA	11 U	NA	24	NA	11 U	NA	NA	NA	NA	NA	NA	NA
PAHs (ug/kg)																	
Benzo(a)anthracene	130	170	4.9 U	5.0 U	5.4	130	4.6 U	95	5.0 U	4.8 U	11	NA	62	4.4 U	300	1400	80
Chrysene	190	520	4.9 U	5.9	6.9	150	4.6 U	140	5.0 U	4.8 U	17	NA	99	4.4 U	360	1800	130
Benzo(b)fluoranthene	98	780	4.9 U	5.0 U	6.9	90	4.6 U	79	5.0 U	4.8 U	12	NA	58	4.4 U	190	740	48
Benzo(k)fluoranthene	98	510	4.9 U	5.0 U	6.9	90	4.6 U	79	5.0 U	4.8 U	11	NA	52	4.4 U	190	740	48
Benzo(a)pyrene**	**160**	**510**	4.9 U	5.0 U	9.3	**180**	4.6 U	140	5.0 U	4.8 U	14	NA	78	4.4 U	**370**	**1,400**	69
Indeno(1,2,3-cd)pyrene	77	580	4.9 U	5.0 U	8.8	82	4.6 U	62	5.0 U	4.8 U	12	NA	43	4.4 U	170	480	34
Dibenzo(a,h)anthracene	42	320	4.9 U	5.0 U	4.9 U	34	4.6 U	25	5.0 U	4.8 U	5.0 U	NA	20	4.4 U	88	240	12
TTEC**	**206**	**751**	NA	0.06	12	**224**	NA	**175**	NA	NA	19	NA	102	NA	**467**	**1,778**	93
PCBs (ug/kg)																	
Aroclor 1016	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA	NA	NA	NA
Aroclor 1242	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA	NA	NA	NA
Aroclor 1248	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	94 J	33 UJ	NA	NA	NA	NA
Aroclor 1254**	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	78 J	33 UJ	NA	NA	NA	NA
Aroclor 1260	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	49 UJ	33 UJ	NA	NA	NA	NA
Aroclor 1221	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA	NA	NA	NA
Aroclor 1232	32 UJ	NA	NA	NA	31 UJ	NA	NA	NA	NA	NA	NA	33 UJ	33 UJ	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	172 J	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	5 UJ	5 UJ	NA	5 UJ	5 UJ	5 UJ	NA	5 UJ	NA	5 UJ	5 UJ	NA	5 UJ	NA	5 UJ	NA	5 UJ
Arsenic**	17	8	NA	6	5	7	NA	7	NA	6	8	NA	8	NA	7	NA	7
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.2 U	0.2 U	NA	0.2 U	0.2 U	0.2 U	NA	0.2 U	NA	0.2 U	0.2 U	NA	0.2 U	NA	0.2 U	NA	0.2 U
Chromium	29.1	27.3	NA	22.3	19.4	26.5	NA	24.4	NA	28.6	30.7	NA	24.1	NA	26	NA	19.8
Copper**	24.8	27	NA	10.9	6.9	12	NA	11.4	NA	7.3	31.2	NA	20.5	NA	19.3	NA	10
Lead**	19	18	NA	4	2 U	5	NA	5	NA	2 U	9	NA	14	NA	10	NA	4
Mercury	0.04	0.06	NA	0.03	0.02 U	0.02	NA	0.04	NA	0.03 U	0.05	NA	0.03	NA	0.03	NA	0.02 U
Nickel	30	28	NA	23	23	28	NA	25	NA	27	35	NA	25	NA	27	NA	26
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.3 U	0.3 U	NA	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA	0.3 U	0.3 U	NA	0.3 U	NA	0.3 U	NA	0.3 U
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	72	65	NA	29	24	32	NA	32	NA	27	51	NA	43	NA	44	NA	43

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-91	SB-91	SB-92	SB-92	SB-93	SB-93	SB-93	SB-93	SB-93A	SB-93A	SB-93A	SB-94	SB-94	SB-94	SB-95	SB-95	SB-95
Sample ID Depth Interval (feet bgs):	0 - 0.5	2 - 3	0 - 0.5	2 - 3	8	10	10	14	6	10	15	5	10	15	8	11	14
Date Collected:	10/26/2009	10/26/2009	10/26/2009	10/26/2009	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/25/2010	6/25/2010	6/25/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010
Field QC:							Field Duplicate										
TPH (mg/kg)																	
Diesel-range**	NA	NA	NA	NA	1,900 J	25 J	28 J	52 J	6.9 UJ	6.6 UJ	6.2 UJ	53 J	200 J	1,900 J	**3,100 J**	24 J	290 J
Oil-range**	NA	NA	NA	NA	110 J	14 UJ	13 UJ	13 UJ	14 UJ	13 UJ	12 UJ	380 J	12 UJ	80 J	110 J	13 UJ	22 J
PAHs (ug/kg)																	
Benzo(a)anthracene	530	1300	8.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	760	1700	12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	390	910	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	390	910	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	**690**	**1,600**	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	330	760	6.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	150	400	4.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	**877**	**2,045**	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																	
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	5 UJ	NA	5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	8	NA	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.2 U	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	26.1	NA	23.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	30.6	NA	11.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead**	18	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.09	NA	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	33	28	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.3 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	49	NA	579	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-96	SB-96	SB-96	SB-97	SB-97	SB-97	SB-98	SB-98	SB-98	SB-100	SB-100	SB-100	SB-101	SB-101	SB-102	SB-102	SB-102
Sample ID Depth Interval (feet bgs):	8	11	14	7	11	14	6	10	15	5	10	14	5	15	5	11	14
Date Collected:	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010
Field QC:																	
TPH (mg/kg)																	
Diesel-range**	**3,300 J**	**2,100 J**	1,200 J	5.6 UJ	96 J	**2,800 J**	5.1 UJ	560 J	23 J	**2,000 J**	**4,600 J**	**2,800 J**	**2,000 J**	**3,100 J**	**8,400 J**	**4,800 J**	1,300 J
Oil-range**	260 J	140 J	50 J	11 UJ	13 UJ	110 J	10 UJ	120 J	13 UJ	100 J	210 J	180 J	77 J	190 J	350 J	200 J	54 J
PAHs (ug/kg)																	
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																	
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SB-103	SB-103	SB-103	SB-104	SB-105	SB-105	SB-106	SB-106	SB-107	SB-107	SB-107	SS1	SS2	SS3	SS4	SS5	SS6
Sample ID Depth Interval (feet bgs):	6	10	13	5	6	11	5	10	5	10	13	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Date Collected:	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	6/25/2010	3/4/2003	3/5/2003	3/4/2003	3/4/2003	3/4/2003	3/5/2003
Field QC:																	
TPH (mg/kg)																	
Diesel-range**	6.2 UJ	6.4 UJ	1,300 J	6.7 J	5.5 UJ	8.0 UJ	6.8 UJ	7.2 UJ	5.8 UJ	7.1 UJ	6.6 UJ	25U	50U	25U	570	25U	25U
Oil-range**	12 UJ	13 UJ	45 J	10 UJ	11 UJ	16 UJ	14 UJ	22 J	12 UJ	14 UJ	17 J	280	680	260	870	450	130
PAHs (ug/kg)																	
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																	
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4U	12U	14U	**84**	**210**	3.1U
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.56U	2.0U	2.3U	2.9	3.2	0.51U
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	51	150	51	96	18
Copper**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	750	2,000	2,600	1,400	2,000	84
Lead**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24	28	230	240	**550**	13
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.16	0.02U	0.29	0.34	0.97	0.02U
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,100	990	3,100	1,600	2,800	120

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SS-1	SS-1	SS-2	SS-2	SS-4	SS-4	SS-5	SS-5	SS-5	SS-6	SS-6	SS-7	SS-7	SS-8		SS-8	SS-9	SS-9
Sample ID Depth Interval (feet bgs):	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	5.0 - 5.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5		3.0 - 3.5	1.0 - 1.5	3.0 - 3.5
Date Collected:	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/12/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007		4/2/2007	4/2/2007	4/2/2007
Field QC:															Field Duplicate			
TPH (mg/kg)																		
Diesel-range**	120	NA	**5,500**	21*	810*	NA	720*	**2,700***	890	68	NA	26	NA	220 J*	130 J	NA	30*	NA
Oil-range**	190	NA	**26,000**	180	1,800	NA	**3,300***	**10,000***	320	30	NA	36	NA	590	410	NA	110	NA
PAHs (ug/kg)																		
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	**21.9**	18.1 J	**24.8**	10.8 J	16.3	4.36	15.2	16.1	NA	5.58	9.21 J	3.74	5.68 J	**89.0 J**	**27.0 J**	4.19 J	9.54	5.60 J
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.596 U	0.602 U	0.549	0.540 U	0.600 U	0.552 U	0.722	0.660 U	NA	0.564 U	0.556 U	0.546 U	0.625 U	0.960	0.985	0.562 U	0.437 U	0.579 U
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	51.3 J	41.9 J	135 J	32.7 J	172	11.8	1,280	44.6	NA	16.4	40.2 J	11.5	15.4 J	1,400	539	48.0	45.9	17.9 J
Lead**	16.0	14.2 J	91.4	9.17 J	82.0	2.81	**305**	10.3	NA	3.37	10.3 J	4.57	6.27 J	**697 J**	189 J	3.46 J	11.3	4.04 J
Mercury	0.105 U	0.120 UJ	0.365	0.109 UJ	0.418	0.109 U	0.449	0.141	NA	0.110 U	0.108 UJ	0.111 U	0.119 UJ	8.87 J	1.86 J	0.112 UJ	0.143	0.110 UJ
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	101 J	111 J	95.5 J	73.2 J	178	31.5	501	86.4	NA	63.5	73.8 J	35.9	37.1 J	1,370 J	732 J	73.9	245	45.2 J

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SS-10	SS-10	SS-11	SS-11	SS-12	SS-12	SS-13	SS-13	SS-14	SS-14	SS-15	SS-15	SS-16	SS-16	SS-17	SS-17	SS-18	SS-18
Sample ID Depth Interval (feet bgs):	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5
Date Collected:	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/12/2007	4/12/2007	4/2/2007	4/2/2007	4/2/2007	4/2/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007
Field QC:																		
TPH (mg/kg)																		
Diesel-range**	140*	NA	25*	NA	220*	NA	140	NA	370*	NA	7.7*	NA	5.4 U	NA	5.3 U	NA	5.2 U	NA
Oil-range**	460	NA	120*	NA	570	NA	870	NA	720	NA	34	NA	12*	NA	10 U	NA	10 U	NA
PAHs (ug/kg)																		
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																		
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																		
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	**38.2**	4.84 J	**79.1**	3.74 J	**461**	6.94	**64.4**	8.07 J	**687**	14.5 J	5.51	NA	5.78	NA	3.82	NA	2.99	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.546	0.562 U	1.01	0.571 U	1.25	0.482 U	1.08	0.531 U	2.12	0.479 U	0.517 U	NA	0.748	NA	0.561 U	NA	0.550 U	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	648	9.87 J	82.5	8.79 J	**3,080**	22.6	1,310	47.9 J	**3,350**	58.1 J	8.28	23.8	21.4	12.6	18.6	202	7.52	40.5
Lead**	190	2.69 J	79.3	2.05 J	**810**	11.8	**604**	17.1 J	**1,910**	20.8 J	2.21	NA	5.21	NA	1.85	NA	1.66	NA
Mercury	3.86	0.109 UJ	0.109 U	0.104 UJ	3.25	0.112 U	14.3	0.145 J	2.17	0.112 U	0.109 U	NA	0.108 U	NA	0.107 U	NA	0.109 U	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	668	28.5 J	285	27.7 J	1,880	252	799	59.9 J	2,100	121 J	24.0	39.2	462	29.7	77.7	116	26.2	57.7

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SS-19	SS-19	SS-20	SS-20	SS-21	SS-21	SS-22	SS-22	SS-22	SS-23	SS-23	SS-24	SS-24	SS-25	SS-25	SS-26	SS-26
Sample ID Depth Interval (feet bgs):	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	5.0 - 5.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5
Date Collected:	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007
Field QC:																	
TPH (mg/kg)																	
Diesel-range**	5.2 U	NA	970*	30	5.5 U	NA	**4,800**	1,200	170	5.6*	NA	9.2*	NA	150*	140	53*	NA
Oil-range**	10 U	NA	1,100	36	11 U	NA	110	150*	14*	16	NA	28*	NA	380	66	180*	NA
PAHs (ug/kg)																	
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)																	
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																	
Antimony**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic**	4.31	NA	3.19	NA	4.31	NA	2.57	NA	NA	4.70	NA	6.87	NA	**196**	**29.8 J**	4.46	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.532 U	NA	0.642 U	NA	0.569 U	NA	0.577 U	NA	NA	0.645 U	NA	0.538 U	NA	0.896	0.696 U	0.606 U	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper**	8.40	51.8	25.1	10.6	9.47	7.30	10.8	69.1	NA	25.8	22.4	13.3	22.5	1,240	61.1 J	14.2	31.9
Lead**	2.00	NA	3.97	NA	2.09	NA	2.06	NA	NA	4.06	NA	4.00	NA	**444**	7.16 J	3.90	NA
Mercury	0.108 U	NA	0.122 U	NA	0.126 U	NA	0.114 U	NA	NA	0.122 U	NA	0.113 U	NA	1.94	0.145 U	0.107 U	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	25.8	87.1	69.3	23.4	22.9	24.3	22.9	57.3	NA	40.0	54.6	221	39.1	1,830	66.0 J	49.0	49.2

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SS-27	SS-27	SS-28	SS-28	SS-29	SS-29	SS-30	SS-31	SS-32		SS-33	SS-34		SS-35	SS-36	SS-37	SS-38
Sample ID Depth Interval (feet bgs):	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5	1.0 - 1.5	3.0 - 3.5											
Date Collected:	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	4/12/2007	1/21/2009	1/21/2009	1/6/2009		1/6/2009	1/21/2009		1/6/2009	1/6/2009	1/21/2009	1/6/2009
Field QC:										Field Duplicate			Field Duplicate				
TPH (mg/kg)																	
Diesel-range**	40*	NA	150*	NA	33*	5.8 U	240	140	120	83	150	100	100	78	200	100	1,900
Oil-range**	150	NA	490*	NA	140	26*	620	420	250	190	190	120	160	270	720	350	1,400
PAHs (ug/kg)																	
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	690	1,400	580	490	140 J	220 J	490	260	1,100	600	880
Chrysene	NA	NA	NA	NA	NA	NA	1,000	2,000	690	610	160 J	360 J	920	320	1,300	1,000	1,300
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	990	1,700	540	510	140 J	450 J	700	280	1,100	870	1,200
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	990	1,700	540	510	140 J	450 J	700	280	1,100	1,200	1,200
Benzo(a)pyrene**	NA	NA	NA	NA	NA	NA	**1,300**	**1,600**	**660**	**600**	**170 J**	**370 J**	**530**	**220**	**940**	**710**	**1,400**
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	920	810	420	410	90 J	240	260	110	630	240 J	830
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	400	360	170	170	38 J	110	120	46	260	4.7 U	350
TTEC**	NA	NA	NA	NA	NA	NA	**1,709**	**2,217**	**892**	**815**	**226 J**	**521 J**	**766**	**321**	**1,372**	**1,011 J**	**1,859**
PCBs (ug/kg)																	
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Aroclor 1254**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	NA	NA	NA	NA	140	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31 U	NA	NA	NA	NA	65 U	NA
Total PCBs**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	NA	NA	NA	NA	140	NA
Organotins (ug/kg)																	
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59	NA	NA	NA	NA	530	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	NA	NA	NA	NA	380	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63	NA	NA	NA	NA	260	NA
Metals (mg/kg)																	
Antimony**	NA	NA	NA	NA	NA	NA	30 U	**320**	**40**	**50**	30 U	30 U	30 U	30 U	**140**	**80**	**150**
Arsenic**	**39.6**	4.32 J	**132**	3.03 J	4.17	NA	**140**	**2,220**	**310**	**350**	**30**	**140**	**130**	**130**	**530**	**480**	**660**
Beryllium	NA	NA	NA	NA	NA	NA	0.6 U	1 U	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.4	0.5 U	0.7
Cadmium	0.607 U	0.696 U	1.04	0.613 U	0.519 U	NA	1	5	2	2	1.0 U	1	1	2	2.3	3	2.7
Chromium	NA	NA	NA	NA	NA	NA	147	136	81	85	53	58	62	101	75	128	146
Copper**	207	16.7 J	902	9.28 J	16.5	11.2	**3,340**	**3,710**	2,040	2,180	2,250	**3,140**	**3,130**	**3,330**	1,870	1,900	2,210
Lead**	45.5	2.47 J	189	2.41 J	5.20	NA	**330**	**1,740**	**380**	**390**	40	90	90	180	**799**	**810**	**881**
Mercury	0.145	0.108 U	0.805	0.115 U	0.350	NA	0.68	0.87	0.55	0.65	0.26	0.14	0.12	0.34	5.06	3.28	10.2
Nickel	NA	NA	NA	NA	NA	NA	90	70	34	32	28	38	37	46	35	67	25
Selenium	NA	NA	NA	NA	NA	NA	30 U	50 U	30 U	30 U	30 U	30 U	30 U	30 U	10 U	30 U	10 U
Silver	NA	NA	NA	NA	NA	NA	**2**	**4**	2 U	2 U	2 U	2 U	2 U	**2**	**1.1**	2 U	**1.4**
Thallium	NA	NA	NA	NA	NA	NA	30 U	50 U	30 U	30 U	30 U	30 U	30 U	30 U	10 U	30 U	10 U
Zinc	148	37.5 J	1,640	31.2 J	37.5	33.8	3,110	7,790	2,320	1,980	890	800	667	2,300	2,310	3,690	1,730

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 1
Analytical Results for TPHs, cPAHs, PCBs, Butyl Tins and Metals in Soil
Everett Shipyard

Sample ID:	SS-39	SS-39	SS-40	SS-41-2
Sample ID Depth Interval (feet bgs):	0.5 - 1	1 - 2		
Date Collected:	12/4/2008	12/4/2008	12/3/2008	12/3/2008
Field QC:				
TPH (mg/kg)				
Diesel-range**	59	NA	5.1 U	180
Oil-range**	370	NA	10 U	490
PAHs (ug/kg)				
Benzo(a)anthracene	130	4.6 U	12	2,000
Chrysene	150	4.6 U	20	2,200
Benzo(b)fluoranthene	110	4.6 U	14	2,400
Benzo(k)fluoranthene	110	4.6 U	12	2,100
Benzo(a)pyrene**	130	4.6 U	16	**2,000**
Indeno(1,2,3-cd)pyrene	77	4.6 U	9.1	1,200
Dibenzo(a,h)anthracene	35	4.6 U	4.6 U	590
TTEC**	**178**	NA	21	**2,851**
PCBs (ug/kg)				
Aroclor 1016	NA	NA	NA	330 U
Aroclor 1242	NA	NA	NA	330 U
Aroclor 1248	NA	NA	NA	820 UJ
Aroclor 1254**	NA	NA	NA	**2,200**
Aroclor 1260	NA	NA	NA	460
Aroclor 1221	NA	NA	NA	330 U
Aroclor 1232	NA	NA	NA	330 U
Total PCBs**	NA	NA	NA	**2,660**
Organotins (ug/kg)				
Tributyltin as TBT Ion	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA
Metals (mg/kg)				
Antimony**	27 J	NA	5 U	**100**
Arsenic**	**134 J**	5 U	5	**1,110**
Beryllium	0.1	NA	0.1 U	0.5 U
Cadmium	0.9	NA	0.3	11
Chromium	40.5	NA	21.1	83
Copper**	305	9.1	49.9	2,700
Lead**	182 J	NA	39	**1,270**
Mercury	1.01	0.05 UJ	0.11	6.02
Nickel	27	NA	21	32
Selenium	5 U	NA	5 U	30 U
Silver	0.3 U	NA	0.3 U	**2**
Thallium	5 U	NA	5 U	30 U
Zinc	655	87	128	7,720

Notes:
bgs - below ground surface
cPAHs - Carcinogenic Polycyclic Aromatic Hydrocarbons
J - Estimated value
mg/kg - milligrams per kilogram
NA - Not analyzed or not available
PCBs - Polychlorinated biphenyls
SS - sub-slab soil sample
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.
* Sample was re-analyzed . For reporting purposes higher value if detected was used, while the lower undetect was used if undetected
* Chromatographic profile does not match the laboratory standard chromatogram

Table 2
Analytical Results for VOCs in Soil
Everett Shipyard

Sample ID:	SB-02	SB-08	SB-09	SB-09	SB-11	SB-17	SB-19	SB-28
Sample ID Depth Interval (feet bgs):	2 - 3	4 - 5	2 - 3	4 - 5	4 - 5	5 - 6	4 - 5	4 - 5
Date Collected:	12/11/2008	12/10/2008	12/10/2008	12/10/2008	12/11/2008	12/3/2008	12/4/2008	12/4/2008
Field QC:								
VOCs (ug/kg)								
Chloromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Bromomethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Vinyl Chloride	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Chloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Methylene chloride	2.5 U	2.9 U	2.6 U	2.6 J	2.0 U	6.4	3.1 J	4.5
Acetone	18 U	57 J	49	14 J	5.0 U	23	38	19
Carbon disulfide	7.0	6.5	4.4	1.9 J	1.0 U	1.7	10 J	1.2 U
1,1-Dichloroethene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
1,1-Dichloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
trans-1,2-Dichloroethene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
cis-1,2-Dichloroethene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Chloroform	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane (EDC)	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
2-Butanone (methyl ethyl ketone)	6.2 U	7.2 U	6.5 U	5.3 UJ	5.0 U	7.8	5.8 U	6.2 U
1,1,1-Trichloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Carbon tetrachloride	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Vinyl acetate	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 UJ
Bromodichloromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
1,2-Dichloropropane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
cis-1,3-dichloropropene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Trichloroethene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Dibromochloromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
1,1,2-Trichloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Benzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	2.5	1.2 U	1.2 U
trans-1,3-Dichloropropene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
2-Chloroethylvinylether	R	R	R	R	R	R	R	R
Bromoform	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
4-Methyl-2-pentanone (methyl isobu	6.2 U	7.2 U	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 U	6.2 U
2-Hexanone	6.2 U	7.2 U	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 U	6.2 U
Tetrachloroethene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	13
1,1,2,2-Tetrachloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Toluene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	3.6	1.2 U	1.2 U
Chlorobenzene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Ethylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	4.8	1.2 U	1.2 U
Styrene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Trichlorofluoromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	2.5 U	2.9 U	2.6 U	2.1 UJ	2.0 U	2.3 U	2.3 U	2.5 U
m,p-xylene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	8.9	1.2 U	1.2 U
o-Xylene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.9	1.2 U	1.2 U
1,2-Dichlorobenzene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
1,3-Dichlorobenzene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
1,4-Dichlorobenzene	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Acrolein	62 U	72 UJ	65 U	53 UJ	50 U	58 U	R	62 U
Iodomethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Bromoethane	2.5 U	2.9 U	2.6 U	2.1 UJ	2.0 U	2.3 U	2.3 U	2.5 U
Acrylonitrile	6.2 U	7.2 U	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 U	6.2 U
1,1-Dichloropropene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Dibromomethane	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
1,1,1,2-Tetrachloroethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
1,2-Dibromo-3-chloropropane	6.2 U	7.2 U	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 U
1,2,3-Trichloropropane	2.5 U	2.9 U	2.6 U	2.1 UJ	2.0 U	2.3 U	2.3 U	2.5 U
trans-1,4-Dichloro-2-butene	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 U
1,3,5-Trimethylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	33	1.2 U	1.2 U
1,2,4-Trimethylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	61	1.2 U	1.2 U
Hexachloro-1,3-butadiene	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 U
1,2-Dibromoethane (EDB)	1.2 U	1.4 UJ	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
Bromochloromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Dichlorodifluoromethane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
2,2-Dichloropropane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
1,3-Dichloropropane	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
Isopropylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	4.4	1.2 U	1.2 U
n-Propylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	26	1.2 U	1.2 U
Bromobenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
2-Chlorotoluene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
4-Chlorotoluene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 UJ	1.2 U
tert-Butylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U
sec-Butylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	4.9	1.2 U	1.2 U
4-Isopropyltoluene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	3.7	1.2 U	1.2 U
n-Butylbenzene	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	23	1.2 U	1.2 U
1,2,4-Trichlorobenzene	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 U
Naphthalene	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	14	5.8 UJ	6.2 UJ
1,2,3-Trichlorobenzene	6.2 U	7.2 UJ	6.5 U	5.3 UJ	5.0 U	5.8 U	5.8 UJ	6.2 UJ
Methyl tert-butyl ether (MTBE)	1.2 U	1.4 U	1.3 U	1.1 UJ	1.0 U	1.2 U	1.2 U	1.2 U

Notes:
bgs - below ground surface
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown
ug/kg - micrograms per kilogram
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 2
Analytical Results for VOCs in Soil
Everett Shipyard

Sample ID:	SB-33	SB-36	SB-74	SB-93	SB-94	SB-94	SB-95	SB-95
Sample ID Depth Interval (feet bgs):	1 - 2	1 - 2	0 - 0.5	10	10	15	8	14
Date Collected:	12/2/2008	12/2/2008	10/28/2009	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010
Field QC:								
VOCs (ug/kg)								
Chloromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Bromomethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Vinyl Chloride	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Chloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Methylene chloride	4.2	3.2	1.6 UJ	R	R	R	R	R
Acetone	16	81	94 J	27 J	R	R	R	R
Carbon disulfide	1.1 U	6.9 J	2.9 J	4.9 J	5.1 J	R	R	R
1,1-Dichloroethene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,1-Dichloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
trans-1,2-Dichloroethene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
cis-1,2-Dichloroethene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Chloroform	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,2-Dichloroethane (EDC)	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
2-Butanone (methyl ethyl ketone)	5.5 U	11	17 J	R	R	R	R	R
1,1,1-Trichloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Carbon tetrachloride	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Vinyl acetate	5.5 U	5.0 UJ	4.1 UJ	R	R	R	R	R
Bromodichloromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,2-Dichloropropane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
cis-1,3-dichloropropene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Trichloroethene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Dibromochloromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,1,2-Trichloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Benzene	1.1 U	1.0 U	0.8 UJ	1.4 J	1.4 J	R	R	R
trans-1,3-Dichloropropene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
2-Chloroethylvinylether	R	R	R	R	R	R	R	R
Bromoform	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
4-Methyl-2-pentanone (methyl isobu	5.5 U	5.0 U	4.1 UJ	R	R	R	R	R
2-Hexanone	5.5 U	5.0 U	4.1 UJ	R	R	R	R	R
Tetrachloroethene	1.1 U	1.0 U	36 J	R	R	R	R	R
1,1,2,2-Tetrachloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Toluene	1.1 U	1.0 U	0.8 UJ	R	0.9 J	R	R	R
Chlorobenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Ethylbenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Styrene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Trichlorofluoromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,1,2-Trichloro-1,2,2-trifluoroethane	2.2 U	2.0 U	1.6 UJ	R	R	R	R	R
m,p-xylene	1.1 U	1.0	0.8 UJ	1.0 J	0.8 J	R	R	R
o-Xylene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,2-Dichlorobenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,3-Dichlorobenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,4-Dichlorobenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Acrolein	55 U	50 UJ	41 UJ	R	R	R	R	R
Iodomethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Bromoethane	2.2 U	2.0 U	1.6 UJ	R	R	R	R	R
Acrylonitrile	5.5 U	5.0 U	4.1 UJ	R	R	R	R	R
1,1-Dichloropropene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Dibromomethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,1,1,2-Tetrachloroethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,2-Dibromo-3-chloropropane	5.5 U	5.0 U	4.1 UJ	R	R	R	R	R
1,2,3-Trichloropropane	2.2 U	2.0 U	1.6 UJ	R	R	R	R	R
trans-1,4-Dichloro-2-butene	5.5 U	5.0 U	4.1 UJ	R	R	R	R	R
1,3,5-Trimethylbenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,2,4-Trimethylbenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Hexachloro-1,3-butadiene	5.5 U	5.0 UJ	4.1 UJ	R	R	R	R	R
1,2-Dibromoethane (EDB)	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Bromochloromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Dichlorodifluoromethane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
2,2-Dichloropropane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
1,3-Dichloropropane	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
Isopropylbenzene	1.1 U	1.0 U	0.8 UJ	R	R	290 J	R	58 J
n-Propylbenzene	1.1 U	1.0 U	0.8 UJ	0.8 J	R	460 J	R	100 J
Bromobenzene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
2-Chlorotoluene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
4-Chlorotoluene	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R
tert-Butylbenzene	1.1 U	1.0 U	0.8 UJ	R	1.1 J	R	R	R
sec-Butylbenzene	1.1 U	1.0 U	0.8 UJ	1.1 J	3.3 J	260 J	R	78 J
4-Isopropyltoluene	1.1 U	1.1	0.8 UJ	R	R	R	R	R
n-Butylbenzene	1.1 U	1.0 UJ	0.8 UJ	R	R	120 J	R	87 J
1,2,4-Trichlorobenzene	5.5 U	5.0 UJ	4.1 UJ	R	R	R	R	R
Naphthalene	5.5 U	230	4.1 UJ	R	R	R	R	R
1,2,3-Trichlorobenzene	5.5 U	5.0 UJ	4.1 UJ	R	R	R	R	R
Methyl tert-butyl ether (MTBE)	1.1 U	1.0 U	0.8 UJ	R	R	R	R	R

Notes:

bgs - below ground surface

J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown

ug/kg - micrograms per kilogram

UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 3
Analytical Results for SVOCs in Soil
Everett Shipyard

Sample ID:	MW-7	MW-9	SB-01	SB-02	SB-05	SB-06	SB-07	SB-07	SB-23	SB-23	SB-24	SB-24	SB-25	SB-25	SB-26	SB-26	SB-29	SB-30	SB-30
Sample Depth (feet bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1 - 2	1 - 2	2 - 3	1 - 2	2 - 3	1 - 2	2 - 3	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5	1 - 2
Date Collected:	12/8/2008	12/8/2008	12/11/2008	12/11/2008	12/1/2008	12/10/2008	12/10/2008	12/10/2008	12/1/2008	12/1/2008	1/6/2009	1/6/2009	1/21/2009	1/21/2009	12/11/2008	12/11/2008	12/3/2008	12/3/2008	12/3/2008
Field QC:																			
SVOCs (ug/kg)																			
Phenol	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	160 J	63 UJ	60 U	60 U	60 U
Bis-(2-chloroethyl)ether	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2-Chlorophenol	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
1,3-Dichlorobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
1,4-Dichlorobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Benzyl alcohol	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
1,2-Dichlorobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2-Methylphenol	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2,2'-Oxybis(1-chloropropane)	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
4-Methylphenol	130 J	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	470 J	63 UJ	60 U	60 U	60 U
N-Nitroso-di-n-propylamine	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Hexachloroethane	65 UJ	60 UJ	64 U	60 U	190 U	110 UJ	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Nitrobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	150 UJ	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Isophorone	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2-Nitrophenol	65 UJ	60 UJ	64 U	60 U	190 U	110 UJ	410 U	260 UJ	68 U	60 UJ	120 UJ	63 UJ	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2,4-Dimethylphenol	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Benzoic acid	650 UJ	600 UJ	640 U	600 UJ	1,900 U	1,100 U	4,100 U	2,600 UJ	680 U	600 UJ	1,200 UJ	630 UJ	650 U	650 U	6,200 UJ	630 UJ	600 U	600 U	600 UJ
Bis-(2-chloroethoxy)methane	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2,4-Dichlorophenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
1,2,4-Trichlorobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Naphthalene	65 UJ	60 UJ	64 U	60 U	210	110 U	410 U	260 UJ	1,200	60 U	240 J	63 U	65 U	65 U	290 J	63 UJ	60 U	60 U	60 U
4-Chloroaniline	330 UJ	300 UJ	320 U	300 U	950 UJ	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Hexachlorobutadiene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
4-Chloro-3-methylphenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
2-Methylnaphthalene	65 UJ	60 UJ	64 U	60 U	250	110 U	410 U	260 UJ	3,000	60 U	210 J	63 U	65 U	65 U	2,500 J	63 UJ	60 U	60 U	60 U
Hexachlorocyclopentadiene	330 UJ	300 UJ	320 U	300 U	950 UJ	540 UJ	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
2,4,6-Trichlorophenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
2,4,5-Trichlorophenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
2-Chloronaphthalene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
2-Nitroaniline	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Dimethylphthalate	65 UJ	710 J	64 U	200	840 J	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	90	97	60 U
Acenaphthylene	74 J	82 J	64 U	60 U	200	110 U	410 U	260 UJ	68 U	60 U	120 J	63 U	65 U	65 U	61 UJ	63 UJ	60 U	94	60 U
3-Nitroaniline	330 UJ	300 UJ	320 U	300 U	950 UJ	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Acenaphthene	69 J	62 J	64 U	60 U	190 U	110 U	410 U	260 UJ	170	60 U	340 J	63 U	65 U	65 U	1,700 J	63 UJ	60 U	180	60 U
2,4-Dinitrophenol	650 UJ	600 UJ	640 U	600 U	1,900 UJ	1,100 UJ	4,100 U	2,600 UJ	680 U	600 U	1,200 UJ	630 UJ	650 U	650 U	610 UJ	630 UJ	600 U	600 U	600 U
4-Nitrophenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Dibenzofuran	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	200	60 U	210 J	63 U	65 U	65 U	850 J	63 UJ	60 U	60 U	60 U
2,6-Dinitrotoluene	330 UJ	300 UJ	320 U	300 U	950 UJ	540 UJ	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
2,4-Dinitrotoluene	330 UJ	300 UJ	320 U	300 U	950 UJ	540 UJ	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Diethylphthlalate	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
4-Chlorophenyl-phenyl ether	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Fluorene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	880	60 U	240 J	63 U	65 U	65 U	2,600 J	63 UJ	60 U	70	60 U
4-Nitroaniline	330 UJ	300 UJ	320 U	300 U	950 UJ	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
4,6-Dinitro-2-methylphenol	650 UJ	600 UJ	640 U	600 U	1,900 UJ	1,100 UJ	4,100 U	2,600 UJ	680 U	600 UJ	1,200 UJ	630 UJ	650 U	650 U	610 UJ	630 UJ	600 UJ	600 U	600 U
N-Nitrosodiphenylamine	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
4-Bromophenyl-phenyl ether	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Hexachlorobenzene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Pentachlorophenol	330 UJ	300 UJ	320 U	300 U	950 U	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	930 J	320 UJ	300 U	440	300 U
Phenanthrene	580 J	720 J	64 U	60 U	790	110 U	410 U	260 UJ	1,600	60 U	2,200 J	63 U	65 U	65 U	8,400 J	63 UJ	81	2,700	60 U
Carbazole	86 J	160 J	64 U	60 U	190 U	110 U	410 U	260 UJ	68 U	60 U	200 J	63 U	65 U	65 U	61 UJ	63 UJ	60 U	690	60 U
Anthracene	85 J	160 J	64 U	60 U	240	110 U	410 U	260 UJ	68 U	60 U	440 J	63 U	65 U	65 U	1,400 J	63 UJ	60 U	490	60 U
Di-n-butylphthalate	600 J	130 J	64 U	60 U	1,400	110 U	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	61 UJ	63 UJ	60 U	60 U	60 U
Fluoranthene	880 J	1,700 J	64 U	110	1,500	110 U	410 U	260 UJ	380	60 U	5,000 J	63 U	65 U	65 U	15,000 J	63 UJ	230	8,000	60 U
Pyrene	1,100 J	2,000 J	64 U	82	1,300	170 J	410 U	260 UJ	580	60 U	4,500 J	63 U	65 U	65 U	15,000 J	63 UJ	200	5,600	60 U
Butylbenzylphthalate	65 UJ	64 J	64 U	60 U	190 U	110 U	720 J	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	200 J	63 UJ	60 U	60 U	60 U
3,3'-Dichlorobenzidine	330 UJ	300 UJ	320 U	300 U	950 UJ	540 U	2,100 U	1,300 UJ	340 U	300 U	570 UJ	310 U	320 U	330 U	300 UJ	320 UJ	300 U	300 U	300 U
Bis(2-Ethylhexyl)phthalate	490 J	860 J	64 U	60 U	810	510 J	5,900	900 J	980	60 U	3,100 J	63 U	65 U	65 U	5,600 J	63 UJ	60 U	2,700	60 U
Di-n-octylphthalate	65 UJ	60 UJ	64 U	60 U	190 U	110 UJ	410 U	260 UJ	68 U	60 U	120 UJ	63 U	65 U	65 U	140 J	63 UJ	60 U	60 U	60 U
Benzo(g,h,i)perylene	180 J	550 J	64 U	60 U	670	110 UJ	410 U	260 UJ	68 U	60 U	840 J	63 U	65 U	65 U	1,000 J	63 UJ	60 U	590	60 U
1-Methylnaphthalene	65 UJ	60 UJ	64 U	60 U	190 U	110 U	410 U	260 UJ	3,700	60 U	120 UJ	63 U	65 U	65 U	3,400 J	63 UJ	60 U	60 U	60 U

Notes:

J - Estimated value

NA - Not analyzed

SVOCs - Semivolatile organic compounds

U - Compound was analyzed for but not detected above the reporting limit shown

UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 3
Analytical Results for SVOCs in Soil
Everett Shipyard

Sample ID:	SB-32	SB-35	SB-36	SB-42	SS-33	SS-37	SS-41-2
Sample Depth (feet bgs):	0 - 0.5	1 - 2	1 - 2	0 - 0.5			
Date Collected:	12/1/2008	12/2/2008	12/2/2008	12/1/2008	1/6/2009	1/21/2009	12/3/2008
Field QC:							
SVOCs (ug/kg)							
Phenol	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Bis-(2-chloroethyl)ether	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2-Chlorophenol	180 U	62 U	64 U	170 U	61 U	62 U	58 U
1,3-Dichlorobenzene	180 U	62 U	1.0 U	170 U	61 U	62 U	58 U
1,4-Dichlorobenzene	180 U	62 U	1.0 U	170 U	61 U	62 U	58 U
Benzyl alcohol	180 U	62 U	64 U	170 U	160	62 U	58 U
1,2-Dichlorobenzene	180 U	62 U	1.0 U	170 U	61 U	62 U	58 U
2-Methylphenol	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2,2'-Oxybis(1-chloropropane)	180 U	62 U	64 U	170 U	61 U	62 U	58 U
4-Methylphenol	180 U	62 U	64 U	170 U	210	190	84
N-Nitroso-di-n-propylamine	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Hexachloroethane	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Nitrobenzene	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Isophorone	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2-Nitrophenol	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2,4-Dimethylphenol	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Benzoic acid	1,800 U	620 U	640 UJ	1,700 U	610 U	620 U	580 U
Bis-(2-chloroethoxy)methane	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2,4-Dichlorophenol	910 U	310 U	320 U	850 U	300 U	310 U	290 U
1,2,4-Trichlorobenzene	180 U	62 U	5.0 UJ	170 U	61 U	62 U	58 U
Naphthalene	180 U	480	230	180	61 U	67	58 U
4-Chloroaniline	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Hexachlorobutadiene	180 U	62 U	5.0 UJ	170 U	61 U	62 U	58 U
4-Chloro-3-methylphenol	910 U	310 U	320 U	850 U	300 U	310 U	290 U
2-Methylnaphthalene	180 U	370	130	250	61 U	62 U	58 U
Hexachlorocyclopentadiene	910 U	310 U	320 UJ	850 U	300 U	310 U	290 U
2,4,6-Trichlorophenol	910 U	310 U	320 U	850 U	300 U	310 U	290 U
2,4,5-Trichlorophenol	910 U	310 U	320 U	850 U	300 U	310 U	290 U
2-Chloronaphthalene	180 U	62 U	64 U	170 U	61 U	62 U	58 U
2-Nitroaniline	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Dimethylphthalate	180 U	62 U	64 U	170 U	61 U	62 U	61
Acenaphthylene	180 U	62 U	64 U	1,300	61 U	150	89
3-Nitroaniline	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Acenaphthene	180 U	330	250	170 U	61 U	62 U	130
2,4-Dinitrophenol	1,800 U	620 U	640 UJ	1,700 U	610 U	620 U	580 U
4-Nitrophenol	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Dibenzofuran	180 U	260	120	170 U	61 U	62 U	58 U
2,6-Dinitrotoluene	910 U	310 U	320 U	850 U	300 U	310 U	290 U
2,4-Dinitrotoluene	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Diethylphthlalate	180 U	62 U	64 U	170 U	61 U	62 U	58 U
4-Chlorophenyl-phenyl ether	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Fluorene	180 U	250	250	280	61 U	62 U	110
4-Nitroaniline	910 U	310 U	320 U	850 U	300 U	310 U	290 U
4,6-Dinitro-2-methylphenol	1,800 U	620 U	640 UJ	1,700 U	610 U	620 U	580 U
N-Nitrosodiphenylamine	180 U	62 U	64 U	170 U	61 U	62 U	58 U
4-Bromophenyl-phenyl ether	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Hexachlorobenzene	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Pentachlorophenol	910 U	310 U	320 U	850 U	300 U	310 U	290
Phenanthrene	200	250	480	3,100	61	800	1,800
Carbazole	180 U	150	64 U	170 U	61 U	200	370
Anthracene	180 U	62 U	92	890	61 U	210	440
Di-n-butylphthalate	180 U	62 U	64 U	170 U	61 U	62 U	6,800
Fluoranthene	390	66	360	4,800	110	2,200	3,200
Pyrene	570	62 U	420 J	7,400	100	1,600	3,800
Butylbenzylphthalate	180 U	62 U	64 U	170 U	61 U	140	58 U
3,3'-Dichlorobenzidine	910 U	310 U	320 U	850 U	300 U	310 U	290 U
Bis(2-Ethylhexyl)phthalate	180 U	62 U	64 U	170 U	61 U	220	1,500
Di-n-octylphthalate	180 U	62 U	64 U	170 U	61 U	62 U	58 U
Benzo(g,h,i)perylene	180 U	62 U	64 U	780	61 U	220	630
1-Methylnaphthalene	180 U	200	130	240	61 U	62 U	58 U

Notes:
J - Estimated value
NA - Not analyzed
SVOCs - Semivolatile organic compounds
U - Compound was analyzed for but not detected above the reporting lim
UJ - Compound was analyzed for but not detected above the reporting lin

Table 4
Analytical Results for TPH, cPAHs, PCBs, Butyl Tins, and Conventionals in Groundwater
Everett Shipyard

	SB-01 12/11/2008	SB-07 12/10/2008	SB-08 12/10/2008	SB-09 12/10/2008	SB-10 12/11/2008	SB-11 12/11/2008	SB-19 12/4/2008	SB-43 10/28/2009	SB-93 6/24/2010	SB-94 6/24/2010	SB-94 6/24/2010 Field Duplicate	SB-95 6/24/2010	LB 4 3/5/2003	LB5 3/5/2003	LB6 3/7/2003	LB7 3/5/2003
TPH (mg/L)																
Diesel-range	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	0.37 J	6.0 J	2.7 J	0.17 J	180	130 U	130 U	130 U
Oil-range	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	NA	0.20 UJ	1.0 UJ	0.20 UJ	0.20 UJ	250 U	250 U	250 U	250 U
PAHs (ug/L)																
Benzo(a)anthracene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Chrysene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Benzo(b)fluoranthene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Benzo(k)fluoranthene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Benzo(a)pyrene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Indeno(1,2,3-cd)pyrene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
Dibenzo(a,h)anthracene	NA	0.010 U	NA	NA	NA	NA	0.010 U	1.0 U	NA	NA	NA	NA	NA	2 U	NA	NA
TTEC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/L)																
Aroclor 1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/L)																
Tributyltin as TBT Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibutyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl Tin Ion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional Parameters																
pH (standard units) [Method 150.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TDS (mg/L) [Method 160.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
J - Estimated value
NA - Not analyzed
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4
Analytical Results for TPH, cPAHs, PCBs, Butyl Tins, and Conventionals in Groundwater
Everett Shipyard

	LB8	MW-01			MW-02					MW-03	MW-04				MW-05	
	3/5/2003	3/19/2003	1/6/2009	4/1/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009
TPH (mg/L)																
Diesel-range	130 U	130 U	0.25 U	0.25 U	130 U	0.25 U	0.25 U	NA	NA	210	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U
Oil-range	250 U	250 U	0.5 U	0.50 U	250 U	0.5 U	0.50 U	NA	NA	250 U	0.5 U	0.50 U	NA	NA	0.5 U	0.50 U
PAHs (ug/L)																
Benzo(a)anthracene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Chrysene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Benzo(b)fluoranthene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Benzo(k)fluoranthene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Benzo(a)pyrene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Indeno(1,2,3-cd)pyrene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
Dibenzo(a,h)anthracene	NA	2 U	0.010 U	0.010 U	2 U	0.010 U	0.010 U	1.0 U	1.0 U	NA	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U
TTEC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/L)																
Aroclor 1016	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1242	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1248	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1254	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1260	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1221	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Aroclor 1232	NA	NA	0.010 U	0.010 U	NA	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	NA	NA	0.010 U	0.010 U
Total PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/L)																
Tributyltin as TBT Ion	NA	NA	0.19 U	0.008 U	NA	0.19 U	0.008 U	NA	NA	NA	0.19 U	0.008 U	NA	NA	0.19 U	0.008 U
Dibutyl Tin Ion	NA	NA	0.29 U	0.012 U	NA	0.29 U	0.012 U	NA	NA	NA	0.29 U	0.012 U	NA	NA	0.29 U	0.012 U
Butyl Tin Ion	NA	NA	0.20 U	0.008	NA	0.20 U	0.024	NA	NA	NA	0.20 U	0.008 U	NA	NA	0.20 U	0.008 U
Conventional Parameters																
pH (standard units) [Method 150.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TDS (mg/L) [Method 160.1]	NA	NA	449	384	NA	186	480	NA	NA	NA	613	644	NA	NA	412	154

Notes:
J - Estimated value
NA - Not analyzed
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 4
Analytical Results for TPH, cPAHs, PCBs, Butyl Tins, and Conventionals in Groundwater
Everett Shipyard

	MW-06				MW-07						MW-08		MW-09		MW-10	
	1/6/2009	4/1/2009	10/13/2009		1/6/2009		4/1/2009	7/9/2009		10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009
				Field Duplicate		Field Duplicate			Field Duplicate							
TPH (mg/L)																
Diesel-range	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Oil-range	0.5 U	0.50 U	NA	NA	0.5 U	0.5 U	0.50 U	NA	NA	NA	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U
PAHs (ug/L)																
Benzo(a)anthracene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Chrysene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(b)fluoranthene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(k)fluoranthene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(a)pyrene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Indeno(1,2,3-cd)pyrene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Dibenzo(a,h)anthracene	0.010 U	0.010 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
TTEC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/L)																
Aroclor 1016	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1242	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1248	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1254	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1260	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1221	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aroclor 1232	0.010 U	0.010 U	NA	NA	0.011 U	0.010 U	0.010 U	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Total PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organotins (ug/L)																
Tributyltin as TBT Ion	0.19 U	0.008 U	NA	NA	0.19 U	0.19 U	0.008 U	NA	NA	NA	0.19 U	0.008 U	0.19 U	0.008 U	0.19 U	0.008 U
Dibutyl Tin Ion	0.29 U	0.020	NA	NA	0.29 U	0.29 U	0.012 U	NA	NA	NA	0.29 U	0.012 U	0.29 U	0.012 U	0.29 U	0.012 U
Butyl Tin Ion	0.20 U	0.013	NA	NA	0.20 U	0.20 U	0.008 U	NA	NA	NA	0.20 U	0.008 U	0.20 U	0.008 U	0.20 U	0.008 U
Conventional Parameters																
pH (standard units) [Method 150.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TDS (mg/L) [Method 160.1]	521	198	NA	NA	163	156	188	NA	NA	NA	790	779	721	752	715	470

Notes:
J - Estimated value
NA - Not analyzed
PCBs - Polychlorinated biphenyls
TDS - Total dissolved solids
TPH - Total petroleum hydrocarbons
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 5
Analytical Results for Metals in Groundwater
Everett Shipyard

	SB-01	SB-07	SB-08	SB-09	SB-10	SB-11	SB-19	SB-43	LB 4	LB5	MW-01		
	12/11/2008	12/10/2008	12/10/2008	12/10/2008	12/11/2008	12/11/2008	12/4/2008	10/28/2009	3/5/2003	3/5/2003	3/19/2003	1/6/2009	4/1/2009
Total Metals (mg/L)													
Antimony	NA	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA	NA	0.05 U	0.05 U
Arsenic	NA	NA	NA	NA	0.001 U	NA	NA	NA	NA	NA	0.005 U	0.001 U	0.0002 U
Beryllium	NA	NA	NA	NA	0.001 U	NA	NA	NA	NA	NA	NA	0.001 U	0.001 U
Cadmium	NA	NA	NA	NA	0.002 U	NA	NA	NA	NA	NA	0.005 U	0.002 U	0.002 U
Calcium	NA	NA	NA	NA	52.2	NA	NA	NA	NA	NA	NA	48.8	45.1
Chromium (total) Chromium^{+3} Chromium^{+6}	NA	NA	NA	NA	0.005	NA	NA	NA	NA	NA	0.01 U	0.005 U	0.005 U
Copper	NA	NA	NA	NA	0.002 U	NA	NA	NA	NA	NA	0.006 U	0.002	0.002 U
Lead	NA	NA	NA	NA	0.001 U	NA	NA	NA	NA	NA	0.003 U	0.001 U	0.001 U
Magnesium	NA	NA	NA	NA	35.8	NA	NA	NA	NA	NA	NA	42.7	41.3
Mercury	NA	NA	NA	NA	0.0001 U	NA	NA	NA	NA	NA	0.0002 U	0.0001 U	0.0001 U
Nickel	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	NA	NA	0.01 U	0.01 U
Selenium	NA	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA	NA	0.05 U	0.05 U
Silver	NA	NA	NA	NA	0.003 U	NA	NA	NA	NA	NA	0.007 U	0.003 U	0.003 U
Thallium	NA	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA	NA	0.05 U	0.05 U
Zinc	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	NA	0.007 U	0.01 U	0.01 U
Dissolved Metals (mg/L)													
Antimony	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	0.05 U	0.05 U
Arsenic	0.001 U	0.001 U	0.002	0.001	0.001 U	0.001	0.001 U	0.002	0.005 U	0.005 U	NA	0.001 U	0.0002 U
Beryllium	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA	NA	NA	0.001 U	0.001 U
Cadmium	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.002 U
Calcium	109	101	142	129	54.4	131	104	NA	NA	NA	NA	50.8	47.7
Chromium (total) Chromium^{+3} Chromium^{+6}	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.01 U	0.01 U	NA	0.005 U	0.005 U
Copper	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003	0.006 U	0.006 U	NA	0.002 U	0.002 U
Lead	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA	0.003 U	0.003 U	NA	0.001 U	0.001 U
Magnesium	33.2	63.3	74.5	85.5	36.4	29.0	37.3	NA	NA	NA	NA	45.5	43.2
Mercury	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	NA	0.0002 U	0.0002 U	NA	0.0001 U	0.0001 U
Nickel	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 U
Selenium	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	0.05 U	0.05 U
Silver	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NA	0.007 U	0.007 U	NA	0.003 U	0.003 U
Thallium	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	0.05 U	0.05 U
Zinc	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	0.007 U	0.007 U	NA	0.01 U	0.01 U

Notes:
J - Estimated value
NA - Not analyzed
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Table 5
Analytical Results for Metals in Groundwater
Everett Shipyard

	MW-02					MW-03	MW-04				MW-05		MW-06			
	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	10/13/2009	10/13/2009 Field Duplicate
Total Metals (mg/L)																
Antimony	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Arsenic	0.005 U	0.001	0.0007	0.001 U	0.001 U	0.005 U	0.025	0.0094	0.011	0.006	0.001	0.0013	0.001 U	0.0066	0.004	0.005
Beryllium	NA	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA
Cadmium	0.005 U	0.002 U	0.002 U	NA	NA	0.005 U	0.002 U	0.002 U	NA	NA	0.002 U	0.002 U	0.002 U	0.002 U	NA	NA
Calcium	NA	22.8	63.8	NA	NA	NA	122	117	NA	NA	114	92.4	61.2	27.3	NA	NA
Chromium (total)				NA	NA				NA	NA					NA	NA
$Chromium^{+3}$	0.01 U	0.005 U	0.005 U	NA	NA	0.01 U	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
$Chromium^{+6}$				NA	NA				NA	NA					NA	NA
Copper	0.006 U	0.003	0.002 U	0.004	0.002	0.006 U	0.006	0.002 U	0.002 U	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.016	0.020
Lead	0.003 U	0.001 U	0.001 U	NA	NA	0.003 U	0.001 U	0.001 U	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA
Magnesium	NA	6.6	45.8	NA	NA	NA	25.7	19.8	NA	NA	5.13	3.85	37.6	6.82	NA	NA
Mercury	0.0002 U	0.0001 U	0.0001 U	NA	NA	0.0002 U	0.0001 U	0.0001 U	NA	NA	0.0001 U	0.0001 U	0.0001 U	0.0001 U	NA	NA
Nickel	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01	0.02
Selenium	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Silver	0.007 U	0.003 U	0.003 U	NA	NA	0.007 U	0.003 U	0.003 U	NA	NA	0.003 U	0.003 U	0.003 U	0.003 U	NA	NA
Thallium	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Zinc	0.007 U	0.01 U	0.01 U	0.01 U	0.01 U	0.007 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.02	0.03
Dissolved Metals (mg/L)																
Antimony	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Arsenic	NA	0.001 U	0.0006	0.001 U	0.001 U	NA	0.02	0.0090	0.010	0.006	0.001 U	0.0013	0.001 U	0.0070	0.001 U	0.001
Beryllium	NA	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA
Cadmium	NA	0.002 U	0.002 U	NA	NA	NA	0.002 U	0.002 U	NA	NA	0.002 U	0.002 U	0.002 U	0.002 U	NA	NA
Calcium	NA	20.7	65.4	NA	NA	NA	113	119	NA	NA	104	94.3	56.7	28.3	NA	NA
Chromium (total)																
$Chromium^{+3}$	NA	0.005 U	0.005 U	NA	NA	NA	0.005 U	0.005 U	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
$Chromium^{+6}$																
Copper	NA	0.002 U	0.002 U	0.002 U	0.002 U	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	NA	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA
Magnesium	NA	5.9	45.3	NA	NA	NA	23.2	20.7	NA	NA	4.66	3.94	35.1	7.10	NA	NA
Mercury	NA	0.0001 U	0.0001 U	NA	NA	NA	0.0001 U	0.0001 U	NA	NA	0.0001 U	0.0001 U	0.0001 U	0.0001 U	NA	NA
Nickel	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Selenium	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Silver	NA	0.003 U	0.003 U	NA	NA	NA	0.003 U	0.003 U	NA	NA	0.003 U	0.003 U	0.003 U	0.003 U	NA	NA
Thallium	NA	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA
Zinc	NA	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
J - Estimated value
NA - Not analyzed
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limit shown
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Table 5
Analytical Results for Metals in Groundwater
Everett Shipyard

	MW-07						MW-08		MW-09		MW-10	
	1/6/2009		4/1/2009	7/9/2009		10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009
		Field Duplicate			Field Duplicate							
Total Metals (mg/L)												
Antimony	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Arsenic	0.002 U	0.002	0.0004	0.001 U	0.001 U	0.004	0.002	0.0008	0.003	0.0013	0.002	0.0012
Beryllium	0.001 U	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	0.002 U	0.002 U	0.002 U	NA	NA	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calcium	29.6	29.3	31.6	NA	NA	NA	157	168	137	161	89.0	96.5
Chromium (total)				NA	NA	NA						
Chromium^{+3}	0.005 U	0.005 U	0.005 U	NA	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium^{+6}				NA	NA	NA						
Copper	0.004	0.005	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	0.001 U	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Magnesium	6.0	5.95	7.84	NA	NA	NA	63.7	66.9	45.7	50.8	59.4	69.5
Mercury	0.0001 U	0.0001 U	0.0001 U	NA	NA	NA	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel	0.01	0.01	0.03	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Selenium	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Silver	0.003 U	0.003 U	0.003 U	NA	NA	NA	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Thallium	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Zinc	0.41	0.42	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dissolved Metals (mg/L)												
Antimony	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Arsenic	0.002 U	0.002 U	0.0003	0.001 U	0.001 U	0.003	0.002	0.0007	0.002	0.0013	0.002 U	0.0010
Beryllium	0.001 U	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	0.002 U	0.002 U	0.002 U	NA	NA	NA	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calcium	27.2	27.8	34.2	NA	NA	0.01 U	150	168	128	160	85.2	99.0
Chromium (total)												
Chromium^{+3}	0.005 U	0.005 U	0.005 U	NA	NA	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium^{+6}												
Copper	0.003	0.003	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	0.001 U	0.001 U	0.001 U	NA	NA	NA	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Magnesium	5.46	5.69	9.11	NA	NA	NA	60.8	67.4	42.1	52.1	55.5	75.0
Mercury	0.0001 U	0.0001 U	0.0001 U	NA	NA	NA	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel	0.01 U	0.01 U	0.03	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Selenium	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Silver	0.003 U	0.003 U	0.003 U	NA	NA	NA	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Thallium	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Zinc	0.42	0.42	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:

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limit shown

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limit shown. The reporting limit is an estimated value.

Table 6
Analytical Results for VOCs in Groundwater
Everett Shipyard

	SB-07	SB-10	SB-11	SB-19	SB-43	SB-93	SB-94		SB-95	LB5	LB6	LB7	MW-01			MW-02					MW-04				MW-05	
	12/10/2008	12/11/2008	12/11/2008	12/4/2008	10/28/2009	6/24/2010	6/24/2010		6/24/2010	3/5/2003	3/7/2003	3/5/2003	3/19/2003	1/6/2009	4/1/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009
								Field Duplicate																		
VOCs (ug/L) [Method 8260B]																										
Chloromethane	0.2 U	0.2 U	0.2 U	0.2	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.3 U	NA	NA	0.3 U	0.4 U	NA	NA	0.2 U	0.3 U
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.5 U	2 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U
Chloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	R	R	R	R	5 U	5 U	5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U
Acetone	4.1	5.5 U	6.6 U	3.0 U	NA	R	R	R	R	25 U	25 U	25 U	25 U	3.0 U	2.5 U	25 U	5.6 U	2.5 U	NA	NA	4.9 U	2.5 U	NA	NA	3.0 U	2.5 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	0.2 J	R	NA	NA	NA	NA	0.2 U	0.2 U	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Chloroform	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2-Dichloroethane (EDC)	0.2 U	0.2 U	0.5	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
2-Butanone	2.5 U	2.5 U	2.5 U	2.5 U	NA	R	R	R	R	10 U	10 U	10 U	10 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Vinyl acetate	1.0 U	1.0 U	1.0 U	1.0 U	NA	R	R	R	R	NA	NA	NA	NA	1.0 U	1.0 U	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U
Bromodichloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Dibromochloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Benzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
2-Chloroethylvinylether	R	R	R	R	NA	R	R	R	R	NA	NA	NA	NA	R	R	NA	R	R	NA	NA	R	R	NA	NA	R	R
Bromoform	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
4-Methyl-2-pentanone	2.5 U	2.5 U	2.5 U	2.5 U	NA	R	R	R	R	10 U	10 U	10 U	10 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U
2-Hexanone	2.5 U	2.5 U	2.5 U	2.5 U	NA	R	R	R	R	10 U	10 U	10 U	10 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Toluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3 J	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Chlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Ethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Styrene	0.2 U	0.2 U	0.2 UJ	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	NA	NA	NA	NA	0.2 U	0.2 U	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
m,p-xylene	0.4 U	0.4 U	0.4 U	0.4 U	NA	0.4 J	R	R	R	4 U	4 U	4 U	4 U	0.4 U	0.4 U	4 U	0.4 U	0.4 U	NA	NA	0.4 U	0.4 U	NA	NA	0.4 U	0.4 U
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.3 J	0.2 J	0.3 J	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U
1,4-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U
Acrolein	5.0 U	5.0 U	5.0 U	5.0 U	NA	R	R	R	R	NA	NA	NA	NA	5.0 U	5.0 U	NA	5.0 U	5.0 U	NA	NA	5.0 U	5.0 U	NA	NA	5.0 U	5.0 U
Iodomethane	1.0 U	1.0 U	1.0 U	1.0 U	NA	R	R	R	R	NA	NA	NA	NA	1.0 U	1.0 U	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U
Bromoethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	NA	NA	NA	NA	0.2 U	0.2 U	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Acrylonitrile	1.0 U	1.0 U	1.0 U	1.0 U	NA	R	R	R	R	NA	NA	NA	NA	1.0 U	1.0 U	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U
1,1-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Dibromomethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	R	R	R	R	10 U	10 U	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.5 U	2 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U
trans-1,4-Dichloro-2-Butene	1.0 U	1.0 U	1.0 U	1.0 U	NA	R	R	R	R	NA	NA	NA	NA	1.0 U	1.0 U	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U
1,3,5-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.4 J	0.3 J	0.3 J	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.5 U	2 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dibromoethane (EDB)	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Bromochloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Dichlorodifluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	NA	NA	NA	NA	0.2 U	0.2 U	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
2,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,3-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.2 J	6.1 J	5.4 J	1.1 J	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
n-Propylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.2 J	6.8 J	6.1 J	1.2 J	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
Bromobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	0.2 J	0.2 J	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
sec-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	2.0 J	2.0 J	0.8 J	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
n-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	0.8 J	0.8 J	0.6 J	2 U	2 U	2 U	2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.5 U	2 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U
Naphthalene	0.5 U	0.5 U	0.5 U	0.069	1.0 U	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.027 U	2 U	0.5 U	0.027 U	1.0 U	1.0 U	0.5 U	0.014 U	1.0 U	1.0 U	0.5 U	0.019 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	0.5 U	0.5 U	2 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U
Methyl tert-butyl ether (MTBE)	0.2 U	0.2 U	0.2 U	0.2 U	NA	R	R	R	R	2 U	2 U	2 U	2 U	4.6	2.3	2 U	1.1	1.0	NA	NA	0.2 U	0.5 U	NA	NA	0.2 U	0.5 U
Low-Level VOCs (ug/L) [Method 8260 SIM for 2008 & 2009 samples]																										
Vinyl chloride	0.020 U	0.020 U	0.2 U	0.020 U	NA	R	R	R	R	2 U	2 U	2 U	NA	0.020 U	0.020 U	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U
1,1-Dichloroethene	0.020 U	0.020 U	0.2 U	0.020 U	NA	R	R	R	R	2 U	2 U	2 U	NA	0.020 U	0.020 U	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U
Trichloroethene	0.020 U	0.020 U	0.2 U	0.020 U	NA	R	R	R	R	2 U	2 U	2 U	NA	0.020 U	0.020 U	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U
Tetrachloroethene	0.074	0.020 U	0.2 U	0.020 U	NA	R	R	R	R	2 U	2 U	2 U	NA	0.020 U	0.020 U	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U

Notes:

J - Estimated value

NA - Not analyzed or not available

PCBs - Polychlorinated biphenyls

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U - Compound was analyzed for but not detected above the reporting limit shown

UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

VOCs - Volatile organic compounds

Table 6
Analytical Results for VOCs in Groundwater
Everett Shipyard

	MW-06				MW-07						MW-08		MW-09		MW-10	
	1/6/2009	4/1/2009	10/13/2009		1/6/2009		4/1/2009	7/9/2009		10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009
				Field Duplicate		Field Duplicate			Field Duplicate							
VOCs (ug/L) [Method 8260B]																
Chloromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.6 U	NA	NA	NA	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	0.4 U
Bromomethane	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methylene chloride	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	3.0 U	2.8 U	NA	NA	3.0 U	3.2 U	2.8 U	NA	NA	NA	3.0 U	2.5 U	3.0 U	2.5 U	5.8 U	2.5 U
Carbon disulfide	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
cis-1,2-Dichloroethene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane (EDC)	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	2.5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl acetate	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
cis-1,3-Dichloropropene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Benzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chloroethylvinylether	R	R	NA	NA	R	R	R	NA	NA	NA	R	R	R	R	R	R
Bromoform	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Methyl-2-pentanone	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	2.5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	2.5 U	2.5 U	NA	NA	2.5 U	2.5 U	2.5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	NA	NA	0.2	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
m,p-xylene	0.4 U	0.4 U	NA	NA	0.2 U	0.2 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene	0.2 U	0.2 U	NA	NA	0.4 U	0.4 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	0.2 U	0.2 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acrolein	5.0 U	5.0 U	NA	NA	0.2 U	0.2 U	5.0 U	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iodomethane	1.0 U	1.0 U	NA	NA	5.0 U	5.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoethane	0.2 U	0.2 U	NA	NA	1.0 U	1.0 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acrylonitrile	1.0 U	1.0 U	NA	NA	0.2 U	0.2 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	0.2 U	0.2 U	NA	NA	1.0 U	1.0 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	NA	NA	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,4-Dichloro-2-Butene	1.0 U	1.0 U	NA	NA	0.5 U	0.5 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	0.2 U	0.2 U	NA	NA	1.0 U	1.0 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trimethylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	0.5 U	0.5 U	1.0 U	1.0 U	0.2 U	0.2 U	0.5 U	1.0 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (EDB)	0.2 U	0.2 U	NA	NA	0.5 U	0.5 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Isopropylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chlorotoluene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Chlorotoluene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Butylbenzene	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	1.0 U	1.0 U	0.2 U	0.2 U	0.5 U	1.0 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	0.5 U	0.010 U	1.0 U	1.0 U	0.5 U	0.5 U	0.017 U	1.0 U	1.0 U	1.0 U	0.5 U	0.015 U	0.5 U	0.013 U	0.5 U	0.016 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl tert-butyl ether (MTBE)	0.8	0.9	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
Low-Level VOCs (ug/L) [Method 8260 SIM for 2008 & 2009 samples]																
Vinyl chloride	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	NA	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,1-Dichloroethene	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	NA	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Trichloroethene	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	NA	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Tetrachloroethene	0.020 U	0.020 U	NA	NA	0.2	0.2	0.090	NA	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U

Notes:

J - Estimated value

NA - Not analyzed or not available

PCBs - Polychlorinated biphenyls

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U - Compound was analyzed for but not detected above the reporting limit shown

UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

VOCs - Volatile organic compounds

Table 7
Analytical Results for SVOCs in Groundwater
Everett Shipyard

	SB-07	SB-19	SB-43	LB5	MW-01			MW-02					MW-04				MW-05		
	12/10/2008	12/4/2008	10/28/2009	3/5/2003	3/19/2003	1/6/2009	4/1/2009	3/19/2003	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009	7/9/2009	10/13/2009	1/6/2009	4/1/2009	1/6/2009
SVOCs (ug/L) [Method 8270D]																			
Phenol	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bis-(2-chloroethyl)ether	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzyl alcohol	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylphenol	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,2'-Oxybis (1-chloropropane)	1.0 U	1.0 U	1.0 UJ	NA	NA	1.0 U	1.0 U	NA	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Methylphenol	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.3	1.0 U	1.0 U	1.0 U
N-Nitroso-di-n-propylamine	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachloroethane	1.0 U	1.0 UJ	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nitrobenzene	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isophorone	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitrophenol	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dimethylphenol	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzoic acid	10 U	10 UJ	10 U	20 U	20 U	10 U	10 U	20 U	10 U	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bis-(2-chloroethoxy)methane	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4-Dichlorophenol	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloroaniline	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloro-3-methylphenol	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylnaphthalene	1.0 U	0.020 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.019	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
Hexachlorocyclopentadiene	5.0 U	5.0 U	5.0 UJ	10 U	10 U	5.0 U	5.0 U	10 U	5.0 U	6.1 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,5-Trichlorophenol	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dimethylphthalate	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene	1.0 U	0.010 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
3-Nitroaniline	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	1.0 U	0.010 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.012	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	5.0 U	5.0 U	5.0 U	10 U	10 U	5.0 U	5.0 U	10 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenzofuran	1.0 U	0.010	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
2,6-Dinitrotoluene	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Diethylphthalate	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Chlorophenyl-phenyl ether	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluorene	1.0 U	0.016	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
4-Nitroaniline	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Bromophenyl-phenyl ether	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobenzene	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	5.0 U	5.0 U	5.0 U	10 U	10 U	5.0 U	5.0 U	10 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	1.0 U	0.024 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
Carbazole	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	1.0 U	0.010 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
Di-n-butylphthalate	1.0 U	1.0 U	1.0 U	3 U	3 U	1.0 U	1.0 U	3 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	1.0 U	0.015 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
Pyrene	1.0 U	0.016 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
Butylbenzylphthalate	1.0 U	1.0 U	1.0 UJ	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
3,3'-Dichlorobenzidine	5.0 U	5.0 U	5.0 U	2 U	2 U	5.0 U	5.0 U	2 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U
bis(2-Ethylhexyl)phthalate	1.0 U	1.0 U	13 U	3 U	3 U	1.0 U	1.0 U	3 U	80 J	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.9 U	1.0 U	14 U
Di-n-octylphthalate	1.0 U	1.0 U	1.0 U	2 U	2 U	1.0 U	1.0 U	2 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(g,h,i)perylene	1.0 U	0.010 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U
1-Methylnaphthalene	1.0 U	0.010 U	1.0 U	2 U	2 U	1.0 U	0.010 U	2 U	1.0 U	0.09	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U

Notes:

J - Estimated value

NA - Not analyzed or not available

SVOCs - Semivolatile organic compounds

U - Compound was analyzed for but not detected above the reporting limit shown

UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

Notes:

J - Estimated valı

NA - Not analyze

SVOCs - Semivo

U - Compound w

UJ - Compound ι

Table 7
Analytical Results for SVOCs in Groundwater
Everett Shipyard

	MW-06			MW-07						MW-08		MW-09		MW-10	
	4/1/2009	10/13/2009		1/6/2009		4/1/2009	7/9/2009		10/13/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009	1/6/2009	4/1/2009
			Field Duplicate		Field Duplicate			Field Duplicate							
SVOCs (ug/L) [Method 8270D]															
Phenol	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Bis-(2-chloroethyl)ether	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzyl alcohol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylphenol	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
2,2'-Oxybis (1-chloropropane)	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Methylphenol	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitroso-di-n-propylamine	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachloroethane	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Nitrobenzene	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Isophorone	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitrophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dimethylphenol	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzoic acid	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Bis-(2-chloroethoxy)methane	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4-Dichlorophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloroaniline	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloro-3-methylphenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylnaphthalene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
Hexachlorocyclopentadiene	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,5-Trichlorophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Dimethylphthalate	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
3-Nitroaniline	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
2,4-Dinitrophenol	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
4-Nitrophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenzofuran	0.011	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
2,6-Dinitrotoluene	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Diethylphthalate	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Chlorophenyl-phenyl ether	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluorene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
4-Nitroaniline	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
4,6-Dinitro-2-methylphenol	12 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Bromophenyl-phenyl ether	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobenzene	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.013
Carbazole	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
Di-n-butylphthalate	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
Pyrene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
Butylbenzylphthalate	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
3,3'-Dichlorobenzidine	6.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.1 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-Ethylhexyl)phthalate	1.2 U	1.0 U	1.0 U	260 J	4.6 UJ	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.1 U	1.0 U	4.8 U	1.0 U
Di-n-octylphthalate	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(g,h,i)perylene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U
1-Methylnaphthalene	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	1.0 U	1.0 U	1.0 U	0.010 U	1.0 U	0.010 U	1.0 U	0.010 U

ue
ed or not available
latile organic compounds
was analyzed for but not detected above the reporting limit shown
was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

APPENDIX I

CONTAMINANT MASS CALCULATION TECHNICAL MEMORANDUM

URS

Technical Memorandum

Date: January 5, 2011

To: Jim Flynn, URS

Copy:

From: Jessica Wellmeyer, URS

Subject: **Mass Removal Calculation for Cleanup Action Alternatives**
Everett Shipyard
1016 14th Street
Everett, Washington

Contaminant masses of selected indicator hazardous substances at the Everett Shipyard site were calculated for the purpose of evaluating performance potential of the remedial alternatives presented in the RI/FS report. The selected indicator hazardous substances included in the calculation are as follows:

- Oil-range hydrocarbons,
- Diesel-range hydrocarbons,
- Total PCBs,
- Arsenic,
- Lead, and
- cPAHs using the total toxic equivalent concentration (TTEC).

The remaining indicator hazardous substances in soil (i.e., antimony and copper) were not included in the calculations due to the relatively low number of exceedances and the fact that these substances are co-located with arsenic and/or lead and would be expected to have mass removal rates similar to or exceeding those calculated for arsenic and lead.

The evaluation included the following steps:

1) Subdivide the site into cleanup units (i.e. cells) and assign thicknesses, based on lateral and vertical extent of contamination.
2) Determine the average contaminant concentration within each cleanup unit.
3) Convert concentrations to masses for each cleanup unit.
4) Calculate the contaminant mass that would be removed under each alternative and compare mass removal to the total calculated mass across the site.

Each step is described briefly below.

Step 1: Subdivide the site into cleanup unit cells

The overall site was subdivided into 33 cleanup units. Cleanup unit boundaries were selected based on the lateral and vertical extent of contamination, as reported during RI activities. Boundaries were also set based on ground conditions – whether the areas are set on bare ground, asphalt, concrete, or beneath buildings. The area of each cleanup unit was calculated using CAD for later use in calculating soil mass and volume. These cleanup unit boundaries and areas are shown on Figure 1.

Each cleanup unit was assigned a thickness, representing the approximate average depth of excavation that would be required to remove contamination above the preliminary cleanup levels. Actual depths below ground surface of individual samples are listed in Table 2-2 of the RI/FS Report and were considered in establishing the cleanup unit thickness. Thicknesses were rounded up to the nearest half-foot for each cleanup unit. At several locations (for example, SS-25) where the deepest sample collected exceeded the preliminary cleanup level, the thickness was designated as one foot greater than the depth of the deepest sample. Cleanup units without samples (e.g., 9B and 4C) were assigned depths similar to adjacent cleanup units. Table 1 summarizes areas and thicknesses assigned to individual cleanup units.

Step 2: Determine the average contaminant concentration within each cleanup unit

A worksheet was established for each cleanup unit (Tables 2a-2ab), identifying samples contained within the cleanup unit and respective thickness. For cleanup unit 4C, where sampling data does not exist, sampling locations immediately adjacent to the cleanup unit perimeter were used. Samples shown on each worksheet represent those which exceed preliminary cleanup levels as well as those which would be removed as part of a remedial excavation. From these sample results, an arithmetic mean of concentrations was calculated for each of the following: oil-range hydrocarbons, diesel-range hydrocarbons, total PCBs, arsenic, lead and the TTEC (total toxic equivalent concentration) for cPAHs.

Several assumptions were made in determining average contaminant concentrations:

- Where analytical results were qualified with U (not detected above reporting limit) or J (estimated concentration) flags, the reporting limit and estimated values were used in the calculations, respectively.

- In instances where the TTEC or total PCB result was listed as ‘NA’ due to individual compound concentrations below detection limits (U flagged), a new total (or TTEC) concentration was calculated using the reporting limit.

No mass was assigned to Unit 9B because there are no samples from this unit. Therefore, the mass associated with this unit is not included in any of the cleanup alternatives. This area will be investigated during the remedial design or during the remedial action and soil will be removed as needed to achieve the goals of the cleanup action (e.g., removal of all contaminated soil within 100 feet of the marina).

Step 3: Convert concentrations to masses for each cleanup unit

Soil volume was calculated for each cleanup unit in cubic feet by multiplying the cleanup unit area by the cleanup unit depth. A swell factor of 25 percent was then applied to this initial volume estimate to account for the increase in the volume when soil is excavated. The tonnage estimates were made assuming 1.7 tons per cubic yard of soil. Soil volumes for each cleanup unit are shown on Table 1.

Total soil mass (in kilograms) was calculated based on the estimated tonnage (907.2 kg per ton). The soil mass was multiplied by the average concentration to determine contaminant mass. Appropriate conversion factors were applied to convert contaminant masses into pounds. These calculations are made by cleanup unit and summarized in Tables 2a-2ab.

Step 4: Calculate the contaminant mass that would be removed under each alternative and compare mass removal to the total calculated mass across the site

Contaminant masses and soil volumes for each cleanup unit, calculated in Step 3, are summarized in Table 3. Site-wide contaminant masses and soil volumes were calculated as a summation of all cleanup units.

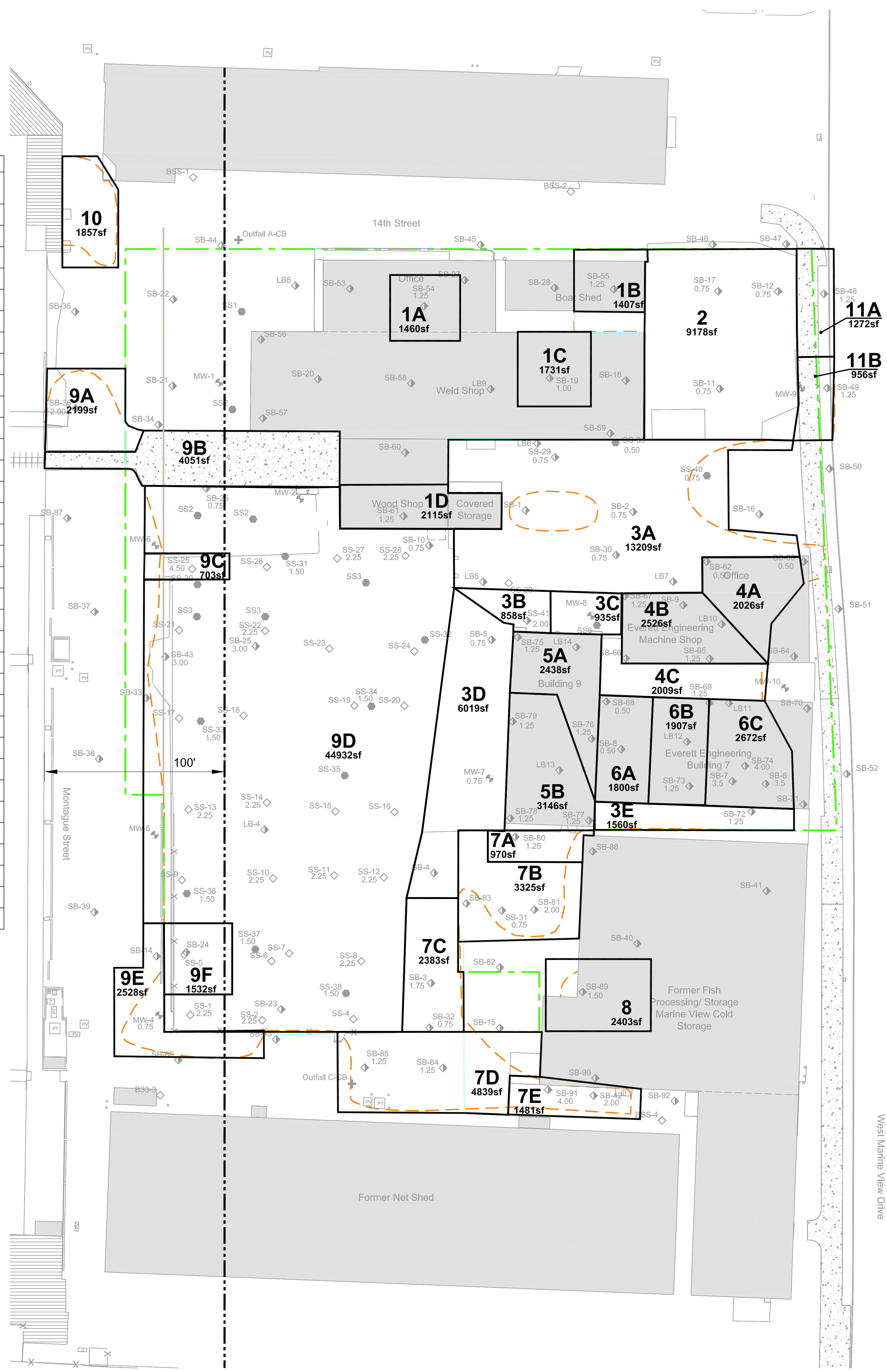
Each of the remedial excavation alternatives are listed at the bottom of the table, along with the corresponding individual cleanup units to be excavated under each alternative. Individual contaminant masses (by compound), as well as total contaminant mass, are calculated for each alternative as a summation of cleanup unit contaminant mass. Performance of each alternative is quantified by comparing contaminant mass removal to the site-wide contaminant mass, yielding a percent removal by alternative.

ATTACHMENTS

Figures

Tables

URS



KEY

Cleanup Unit	Alt 1	Alt 2	Alt 3	Alt 4
1A			X	
1B			X	
1C			X	
1D			X	
2		X	X	X
3A			X	X
3B			X	X
3C			X	X
3D		X	X	X
3E			X	X
4A			X	
4B			X	
4C			X	
5A			X	X
5B	X	X	X	X
6A			X	X
6B			X	X
6C			X	X
7A	X	X	X	X
7B			X	X
7C			X	X
7D			X	X
7E			X	X
8			X	
9A			X	X
9B			X	X
9C		X	X	X
9D		X	X	X
9E			X	X
9F		X	X	X
10	X	X	X	X
11A				
11B				

X = Area of Proposed Excavation

Legend

- Concrete
- Building
- 100 ft Offset from Marina
- Approximate Lease Area Boundary
- Lateral Extent of Impacted Soil
- Monitoring Well
- Soil Boring Sample
- Surface Soil Sample
- Shallow Soil Sample/Hand Auger

0 30 60
SCALE IN FEET

Q:\geo\Everett Shipyard\SubTasks\TM\Alternate\Fig 1 Uplands Cleanup.dwg
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URS

Figure 1
Uplands Cleanup Units

Everett Shipyard
Everett, Washington
DRAFT RI/FS

Table 1
Cleanup Unit Soil Mass

Cleanup Unit	Depth/thickness (feet)	Area (square feet)	Soil Mass (tons)
1A	1.5	1,460	172.36
1B	1.5	1,407	166.10
1C	1	1,731	136.24
1D	1.5	2,115	249.69
2	1	9,178	722.34
3A	1	13,209	1,039.60
3B	2	858	135.06
3C	4	935	294.35
3D	1	6,019	473.72
3E	1.5	1,560	184.17
4A	1.5	2,026	239.18
4B	1.5	2,526	298.21
4C	1.5	2,009	237.17
5A	1.5	2,438	287.82
5B	1.5	3,146	371.40
6A	1	1,800	141.67
6B	1	1,907	150.09
6C	4	2,672	841.19
7A	1.5	970	114.51
7B	2	3,325	523.38
7C	2	2,383	375.10
7D	1.5	4,839	571.27
7E	4	1,481	466.24
8	2	2,403	378.25
9A	2	2,199	346.14
9B	2.5	4,051	797.07
9C	4.5	703	248.98
9D	2.5	44,932	8,840.79
9E	1	2,528	198.96
9F	4.5	1,532	542.58
10	12	1,857	1,753.83
11A	1.5	1,272	150.17
11B	3.5	956	263.34

Notes:
Soil volume is based on the assumption of 1.7 tons per cubic yard of soil, plus 25% swell factor.

Table 2a

Cleanup Unit 1 Mass Removal Calculation Worksheet

Cleanup Unit 1A

Sample ID:	Preliminary Cleanup Levels	SB-54	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Sample ID Depth Interval:		0 - 0.5							
Date Collected:		10/30/2009							
Field QC:									
TPH (mg/kg)							**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	6.1					Diesel-range	0.95	2.10
Oil-range	2,000	22					Oil-range	3.44	7.59
PAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	**194**	1.5	1460	172.36	156366	TTEC	0.03	0.07
PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	76					Total PCBs	0.01	0.03
Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
Arsenic	20	8					Arsenic	1.25	2.76
Lead	250	24					Lead	3.75	8.27

Cleanup Unit 1B

Sample ID:	Preliminary Cleanup Levels	SB-55	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Sample ID Depth Interval:		0 - 0.5							
Date Collected:		10/30/2009							
Field QC:									
TPH (mg/kg)							**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	x					Diesel-range	NA	NA
Oil-range	2,000	x					Oil-range	NA	NA
PAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	62	1.5	1407	166.10	150690	TTEC	0.01	0.02
PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	**1,500**					Total PCBs	0.23	0.50
Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
Arsenic	20	**30**					Arsenic	4.52	9.97
Lead	250	**350**					Lead	52.74	116.29

Cleanup Unit 1C

Sample ID:	Preliminary Cleanup Levels	SB-19	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Sample ID Depth Interval:		0 - 0.5							
Date Collected:		12/4/2008							
Field QC:									
TPH (mg/kg)							**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	7					Diesel-range	0.87	1.91
Oil-range	2,000	26					Oil-range	3.21	7.09
PAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	21	1	1731	136.24	123593	TTEC	0.00	0.01
PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	x					Total PCBs	NA	NA
Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
Arsenic	20	6					Arsenic	0.74	1.64
Lead	250	**373**					Lead	46.10	101.65

Cleanup Unit 1D

Sample ID:	Preliminary Cleanup Levels	SB-61	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Sample ID Depth Interval:		0 - 0.5							
Date Collected:		10/30/2009							
Field QC:									
TPH (mg/kg)							**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	7.9					Diesel-range	1.79	3.95
Oil-range	2,000	25					Oil-range	5.66	12.49
PAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	**756**	1.5	2115	249.69	226517	TTEC	0.17	0.38
PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	34					Total PCBs	0.01	0.02
Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
Arsenic	20	7					Arsenic	1.59	3.50
Lead	250	10					Lead	2.27	4.99

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2b

Cleanup Unit 2 Mass Removal Calculation Worksheet

Sample ID: Sample ID Depth Interval: Date Collected: Field QC:	**Preliminary Cleanup Level**	SB-11 0 - 0.5 12/11/2008	SB-12 0 - 0.5 12/3/2008	SB-17 0 - 0.5 12/3/2008	**Mean Soil Concentrations**		**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
TPH (mg/kg)					**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	32	110	43	Diesel-range	62					Diesel-range	40.41	89.11
Oil-range	2,000	200	220	190	Oil-range	203					Oil-range	133.25	293.81
cPAHs (ug/kg)					**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	88	**493**	**439**	TTEC	**340**	1	9178	722.34	655309	TTEC	0.22	0.49
PCBs (ug/kg)					**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	x	x	x	Total PCBs	NA					Total PCBs	NA	NA
Metals (mg/kg)					**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
Arsenic	20	**110**	**350**	12	Arsenic	**157**					Arsenic	103.10	227.34
Lead	250	167	**355**	69	Lead	197					Lead	129.10	284.66

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)					
Diesel-range		0	110	32	NA
Oil-range		0	220	190	NA
cPAHs (ug/kg)					
TTEC	3	2	493	88	466
PCBs (ug/kg)					
Total PCBs		0	NA	NA	NA
Metals (mg/kg)					
Arsenic		2	350	12	403
Lead		1	355	69	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2c

Cleanup Unit 3A Mass Removal Calculation Worksheet

Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-01 0 - 0.5 12/11/2008	SB-02 0 - 0.5 12/11/2008	SB-29 0 - 0.5 12/11/2008	SB-30 0 - 0.5 12/3/2008	SS-39 0.5 - 1 12/4/2008	SS-40 12/3/2008	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)								**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	5.7	20	20	120	59	5.1	Diesel-range	38					Diesel-range	36.12	79.65
Oil-range	2,000	11	61	60	310	370	10	Oil-range	137					Oil-range	129.21	284.90
cPAHs (ug/kg)								**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	*7.1*	30	**151**	**2,552**	**178**	21	TTEC	**490**	1	13209	1039.60	943123	TTEC	0.46	1.02
PCBs (ug/kg)								**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	*231*	100	36	**1,480**	x	x	Total PCBs	**462**					Total PCBs	0.44	0.96
Metals (mg/kg)								**Metals (mg/kg)**						**PCBs**	**(kg)**	**(lbs)**
Arsenic	20	6	**94**	**33**	**390**	**134**	5	Arsenic	**110**					Arsenic	104.06	229.45
Lead	250	3	121	31	**552**	182	39	Lead	**155**					Lead	145.87	321.64

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)					
Diesel-range		0	120	5.1	NA
Oil-range		0	370	10	NA
cPAHs (ug/kg)					
TTEC	6	3	2552	7.1	960
PCBs (ug/kg)					
Total PCBs		1	1,480	36	758
Metals (mg/kg)					
Arsenic		4	390	5	163
Lead		1	552	3	292

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds
mg - milligrams
ug - micrograms

Table 2d
Cleanup Units 3B and 3C Mass Removal Calculation Worksheet

Cleanup Unit 3B	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Levels	SS-41-2 / 12/3/2008	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	TPH (mg/kg)			2	858	135.06	122522	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	180					Diesel-range	22.05	48.63
	Oil-range	2,000	490					Oil-range	60.04	132.38
	PAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**2,851**					TTEC	0.35	0.77
	PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	**2,660**					Total PCBs	0.33	0.72
	Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	**1,110**					Arsenic	136.00	299.88
	Lead	250	**1,270**					Lead	155.60	343.11

Cleanup Unit 3C	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Levels	MW-8 / 0 - 0.5 / 12/8/2008	MW-8 / 1 - 2 / 12/8/2008	MW-8 / 2 - 3 / 12/8/2008	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	TPH (mg/kg)					**TPH (mg/kg)**		4	935	294.35	267036	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	24	x	x	Diesel-range	24					Diesel-range	6.41	14.13
	Oil-range	2,000	140	x	x	Oil-range	140					Oil-range	37.39	82.43
	PAHs (ug/kg)					**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	119	135	**227**	TTEC	**160**					TTEC	0.04	0.09
	PCBs (ug/kg)					**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	x	Total PCBs	NA					Total PCBs	NA	NA
	Metals (mg/kg)					**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	19	x	x	Arsenic	19					Arsenic	5.07	11.19
	Lead	250	42	x	x	Lead	42					Lead	11.22	24.73

Notes:
All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds
mg - milligrams
ug - micrograms

Table 2e

Cleanup Unit 3D Mass Removal Calculation Worksheet

Cleanup Unit 3D	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	MW-7 / 0 - 0.5 / 12/8/2008	SB-04 / 0 - 0.5 / 12/1/2008	SB-05 / 0 - 0.5 / 12/1/2008	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	TPH (mg/kg)					**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	140	41	190	Diesel-range	123.7					Diesel-range	53.15	117.19
	Oil-range	2,000	420	160	1,500	Oil-range	693.3					Oil-range	297.96	657.01
	cPAHs (ug/kg)					**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**637**	**353**	**1,221**	TTEC	**737**	1	6019	473.72	429757	TTEC	0.32	0.70
	PCBs (ug/kg)					**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	**1,200**	x	**2,180**	Total PCBs	**1,690**					Total PCBs	0.73	1.60
	Metals (mg/kg)					**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	**210**	**160**	**470**	Arsenic	**280**					Arsenic	120.33	265.33
	Lead	250	**336**	188	**644**	Lead	**389**					Lead	167.32	368.94

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary**
TPH (mg/kg)					
Diesel-range		0	1,221	41	NA
Oil-range		0	1500	160	NA
cPAHs (ug/kg)					
TTEC	3	3	1,221	353	737.0
PCBs (ug/kg)					
Total PCBs		2	2,180	1,200	1,690
Metals (mg/kg)					
Arsenic		3	470	160	280
Lead		2	2410	442	1,885

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2f
Cleanup Unit 3E Mass Removal Calculation Worksheet

	Sample ID: Sample ID Depth Interval: Date Collected: Field QC:	Preliminary Cleanup Level	SB-72 0 - 0.5 10/27/2009	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Cleanup Unit 3E	**TPH (mg/kg)**			1.5	1560	184.17	167076	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	6.5					Diesel-range	1.09	2.39
	Oil-range	2,000	14					Oil-range	2.34	5.16
	cPAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**415**					TTEC	0.07	0.15
	PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	*231*					Total PCBs	0.04	0.09
	Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	7					Arsenic	1.17	2.58
	Lead	250	**4630**					Lead	773.56	1705.70

Notes:
All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds
mg - milligrams
ug - micrograms

Table 2g

Cleanup Unit 4A Mass Removal Calculation Worksheet

	Sample ID:	Preliminary Cleanup Level	SB-62	SB-65	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	Sample ID Depth Interval:		SS	0 - 0.5									
	Date Collected:		10/30/2009	10/29/2009									
	Field QC:												
Cleanup Unit 4A	**TPH (mg/kg)**				**TPH (mg/kg)**		1.5	2026	239.18	216985	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	x	5.4	Diesel-range	5					Diesel-range	1.17	2.58
	Oil-range	2,000	x	12	Oil-range	12					Oil-range	2.60	5.74
	cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**155**	**144**	TTEC	**150**					TTEC	0.03	0.07
	PCBs (ug/kg)				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	Total PCBs	NA					Total PCBs	NA	NA
	Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	x	7	Arsenic	7					Arsenic	1.52	3.35
	Lead	250	x	20	Lead	20					Lead	4.34	9.57

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds

Table 2h

Cleanup Unit 4B Mass Removal Calculation Worksheet

	Preliminary Cleanup Level										Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Sample ID:		SB-09	LB10	SB-63	SB-66	SB-66	SB-67	SB-67									
Sample ID Depth Interval:		0 - 0.5	0 - 2	SS	SS	0 - 0.5	SS	0 - 0.5									
Date Collected:		12/10/2008	5/27/2003	10/30/2009	10/29/2009	10/29/2009	10/29/2009	10/29/2009									
Field QC:									**Mean Soil Concentrations**								
TPH (mg/kg)									**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	5.2	19	x	5.5	5.5	x	72	Diesel-range	21					Diesel-range	5.80	12.79
Oil-range	2,000	15	200	x	17	17	x	72	Oil-range	64					Oil-range	17.37	38.30
cPAHs (ug/kg)									**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	95	x	**472**	19	67	26	63	TTEC	**124**	1.5	2526	298.21	270535	TTEC	0.03	0.07
PCBs (ug/kg)									**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	x	x	x	x	x	172	109	Total PCBs	141					Total PCBs	0.04	0.08
Metals (mg/kg)									**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
Arsenic	20	5	x	x	x	7	x	10	Arsenic	7					Arsenic	1.98	4.37
Lead	250	28	x	x	x	89	x	**382**	Lead	166					Lead	45.00	99.22

Cleanup Unit 4B

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

Table 2i

Cleanup Unit 4C Mass Removal Calculation Worksheet

	Sample ID:		SB-66	SB-66	SB-67	SB-67	SB-68	SB-68	SB-69	SB-69	LB11									
	Sample ID Depth Interval:	**Preliminary**	SS	0 - 0.5	SS	0 - 0.5	SS	0 - 0.5	SS	0 - 0.5	0 - 2									
	Date Collected:	**Cleanup Level**	10/29/2009	10/29/2009	10/29/2009	10/29/2009	10/28/2009	10/28/2009	10/28/2009	10/28/2009	5/27/2003			**Unit Thickness**	**Unit Area (sq**					
	Field QC:											**Mean Soil Concentrations**		**(feet)**	**feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
Cleanup Unit 4C	**TPH (mg/kg)**											**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	5.5	5.5	x	72	x	21	5.1	19	43	Diesel-range	24					Diesel-range	5.26	11.60
	Oil-range	2,000	17	17	x	72	x	70	10	81	250	Oil-range	74					Oil-range	15.89	35.04
	cPAHs (ug/kg)											**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	19	67	26	63	**1,145**	22	*7.1*	**235**	x	TTEC	**198**	1.5	2009	237.17	215164	TTEC	0.04	0.09
	PCBs (ug/kg)											**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	172	109	800	71	x	x	x	Total PCBs	288					Total PCBs	0.06	0.14
	Metals (mg/kg)											**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	x	7	x	10	x	7	x	8	x	Arsenic	8					Arsenic	1.72	3.80
	Lead	250	x	89	x	**382**	x	15	x	59	x	Lead	136					Lead	29.32	64.64

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary**
TPH (mg/kg)					
Diesel-range		0	72	5	NA
Oil-range		0	250	10	NA
cPAHs (ug/kg)					
TTEC	9	2	1,145	7	690
PCBs (ug/kg)					
Total PCBs		0	800	71	NA
Metals (mg/kg)					
Arsenic		0	10	7	NA
Lead		1	382	15	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2j

Cleanup Unit 5A Mass Removal Calculation Worksheet

	Sample ID:	Preliminary Cleanup Level	LB14	SB-75	SB-76	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	Sample ID Depth Interval:		0 - 2	0 - 0.5	0 - 0.5									
	Date Collected:		5/27/2003	10/28/2009	10/28/2009									
	Field QC:													
Cleanup Unit 5A	**TPH (mg/kg)**					**TPH (mg/kg)**		1.5	2438	287.8194444	261109.8	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	140	240	70	Diesel-range	150					Diesel-range	39.17	86.36
	Oil-range	2,000	510	540	270	Oil-range	440					Oil-range	114.89	253.33
	cPAHs (ug/kg)					**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	x	**1,418**	**234**	TTEC	**826**					TTEC	0.22	0.48
	PCBs (ug/kg)					**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	**3,600**	**1,560**	Total PCBs	**2,580**					Total PCBs	0.67	1.49
	Metals (mg/kg)					**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	x	**450**	**170**	Arsenic	**310**					Arsenic	80.94	178.48
	Lead	250	x	**690**	248	Lead	**469**					Lead	122.46	270.03

	Number of samples used to calculate mean	Number of samples exceeding Preliminary	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary
TPH (mg/kg)	3				
Diesel-range		0	240	70	NA
Oil-range		0	540	270	NA
cPAHs (ug/kg)					
TTEC		2	1,418	234	826
PCBs (ug/kg)					
Total PCBs		2	3,600	1,560	2,580
Metals (mg/kg)					
Arsenic		2	450	170	310
Lead		1	690	248	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2k

Cleanup Unit 5B Mass Removal Calculation Worksheet

Cleanup Unit 5B	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-77 / 0 - 0.5 / 10/28/2009	SB-78 / 0 - 0.5 / 10/28/2009	SB-79 / 0 - 0.5 / 10/28/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)
	TPH (mg/kg)					**TPH (mg/kg)**		1.5	3146	371.4027778	336937
	Diesel-range	2,000	44	74	86	Diesel-range	68				
	Oil-range	2,000	75	330	260	Oil-range	222				
	cPAHs (ug/kg)					**cPAHs (ug/kg)**					
	TTEC	140	110	**483**	**816**	TTEC	**470**				
	PCBs (ug/kg)					**PCBs (ug/kg)**					
	Total PCBs	1,000	**57,500**	**17,100**	**23,300**	Total PCBs	**32,633**				
	Metals (mg/kg)					**Metals (mg/kg)**					
	Arsenic	20	**79**	**200**	**49**	Arsenic	**109**				
	Lead	250	97	**2220**	157	Lead	**825**				

Contaminant Mass in Cleanup Unit		
TPH	**(kg)**	**(lbs)**
Diesel-range	22.91	50.52
Oil-range	74.69	164.69
cPAHs	**(kg)**	**(lbs)**
TTEC	0.16	0.35
PCBs	**(kg)**	**(lbs)**
Total PCBs	11.00	24.24
Metals	**(kg)**	**(lbs)**
Arsenic	36.84	81.23
Lead	277.86	612.68

	Number of samples used to calculate mean concentration	Number of samples exceeding Preliminary Cleanup Level	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary Cleanup Level
TPH (mg/kg)	3				
Diesel-range		0	86	44	NA
Oil-range		0	330	75	NA
cPAHs (ug/kg)					
TTEC		2	816	110	649.5
PCBs (ug/kg)					
Total PCBs		3	57500	17100	32,633
Metals (mg/kg)					
Arsenic		3	200	49	109
Lead		1	2220	97	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2l
Cleanup Unit 6A Mass Removal Calculation Worksheet

	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-08 / 0 - 0.5 / 12/10/2008	SB-68 / SS / 10/28/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Cleanup Unit 6A	**TPH (mg/kg)**				**TPH (mg/kg)**		1	1800	141.67	128520	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	73	x	Diesel-range	73					Diesel-range	9.38	20.69
	Oil-range	2,000	140	x	Oil-range	140					Oil-range	17.99	39.67
	cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**719**	**1,145**	TTEC	**932**					TTEC	0.12	0.26
	PCBs (ug/kg)				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	800	Total PCBs	800					Total PCBs	0.10	0.23
	Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	17	x	Arsenic	17					Arsenic	2.18	4.82
	Lead	250	71	x	Lead	71					Lead	9.12	20.12

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds
mg - milligrams
ug - micrograms

Table 2m

Cleanup Unit 6B Mass Removal Calculation Worksheet

Cleanup Unit 6B	Sample ID: Sample ID Depth Interval: Date Collected: Field QC:	**Preliminary Cleanup Level**	SB-69 SS 10/28/2009	SB-69 0 - 0.5 10/28/2009	SB-73 SS 10/28/2009	SB-73 0 - 0.5 10/28/2009	LB12 0 - 2 5/27/2003	**Mean Soil Concentrations**		**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
	TPH (mg/kg)							**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	5.1	19	x	410	15	Diesel-range	112					Diesel-range	15.29	33.71
	Oil-range	2,000	10	81	x	**4,500**	35	Oil-range	1,157					Oil-range	157.47	347.22
	cPAHs (ug/kg)							**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	*7.1*	**235**	84	*39.3*	x	TTEC	**91**	1	1907	150.09	136159.8	TTEC	0.01	0.03
	PCBs (ug/kg)							**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	172	99	x	Total PCBs	136					Total PCBs	0.02	0.04
	Metals (mg/kg)							**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	x	8	x	6	x	Arsenic	7					Arsenic	0.95	2.10
	Lead	250	x	59	x	2	x	Lead	31					Lead	4.15	9.16

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2n

Cleanup Unit 6C Mass Removal Calculation Worksheet

Cleanup Unit 6C

Sample ID:	Preliminary Cleanup Level	LB11	SB-06	SB-06	SB-06	SB-07	SB-07	SB-07	SB-69	SB-74	SB-74
Sample ID Depth Interval:		0 - 2	0 - 0.5	1 - 2	2 - 3	0 - 0.5	1 - 2	2 - 3	0 - 0.5	0 - 0.5	2 - 3
Date Collected:		5/27/2003	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008	10/28/2009	10/28/2009	10/28/2009
Field QC:											
TPH (mg/kg)											
Diesel-range	2,000	43	1,000	1,200	240	**2,300**	**2,400**	1,100	19	1,100	**2,100**
Oil-range	2,000	250	**14,000**	**17,000**	**4,000**	**15,000**	**27,000**	**14,000**	81	**11,000**	**25,000**
cPAHs (ug/kg)											
TTEC	140	x	44	x	x	98	*75.5*	x	**235**	*75.5*	x
PCBs (ug/kg)											
Total PCBs	1,000	x	*217*	x	x	240	x	x	x	326	*217*
Metals (mg/kg)											
Arsenic	20	x	5	x	x	6	x	x	8	6	x
Lead	250	x	13	x	x	31	x	x	59	4	x

Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)		4	2672	841.19	763123	**TPH**	**(kg)**	**(lbs)**
Diesel-range	1,150					Diesel-range	877.74	1935.43
Oil-range	**12,733**					Oil-range	9716.92	21425.82
cPAHs (ug/kg)						**cPAHs**	**(kg)**	**(lbs)**
TTEC	106					TTEC	0.08	0.18
PCBs (ug/kg)						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	250					Total PCBs	0.19	0.42
Metals (mg/kg)						**Metals**	**(kg)**	**(lbs)**
Arsenic	6					Arsenic	4.77	10.52
Lead	27					Lead	20.41	45.01

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)	10				
Diesel-range		3	2,400	19	2,267
Oil-range		8	27,000	81	15,875
cPAHs (ug/kg)					
TTEC		1	235	44	NA
PCBs (ug/kg)					
Total PCBs		0	326	217	NA
Metals (mg/kg)					
Arsenic		0	8	5	NA
Lead		0	59	4	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2o

Cleanup Unit 7A Mass Removal Calculation Worksheet

	Sample ID: Sample ID Depth Interval: Date Collected: Field QC:	**Preliminary Cleanup Level**	SB-80 0 - 0.5 10/26/2009	**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
Cleanup Unit 7A	**TPH (mg/kg)**			1.5	970	114.5138889	103887	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	x					Diesel-range	NA	NA
	Oil-range	2,000	x					Oil-range	NA	NA
	cPAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**945**					TTEC	0.10	0.22
	PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	**74,900**					Total PCBs	7.78	17.16
	Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	**45**					Arsenic	4.67	10.31
	Lead	250	133					Lead	13.82	30.47

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2p

Cleanup Unit 7B Mass Removal Calculation Worksheet

Cleanup Unit 7B	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-31 0 - 0.5 12/1/2008	SB-31 1 - 2 12/1/2008	SB-81 0 - 0.5 10/26/2009	SB-81 1 - 2 10/26/2009	SB-83 0 - 0.5 10/26/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	TPH (mg/kg)							**TPH (mg/kg)**		2	3325	523.38	474810	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	14	x	x	27	x	Diesel-range	21					Diesel-range	9.73	21.46
	Oil-range	2,000	38	x	x	76	x	Oil-range	57					Oil-range	27.06	59.68
	cPAHs (ug/kg)							**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**463**	41	**206**	**751**	12	TTEC	**295**					TTEC	0.14	0.31
	PCBs (ug/kg)							**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	*224*	x	*217*	Total PCBs	221					Total PCBs	0.10	0.23
	Metals (mg/kg)							**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	12	x	17	8	5	Arsenic	11					Arsenic	4.99	10.99
	Lead	250	27	x	19	18	2	Lead	17					Lead	7.83	17.27

	Number of samples used to calculate mean concentration	Number of samples exceeding Preliminary Cleanup Level	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary Cleanup Level
TPH (mg/kg)	5				
Diesel-range		0	27	14	NA
Oil-range		0	76	38	NA
cPAHs (ug/kg)					
TTEC		3	751	12	473.3
PCBs (ug/kg)					
Total PCBs		0	224	217	NA
Metals (mg/kg)					
Arsenic		0	17	5	NA
Lead		0	27	2	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)
'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means
Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations
Yellow highlighted samples exceed preliminary cleanup levels within an individual unit
Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated
kg - kilograms
lbs - pounds
mg - milligrams
ug - micrograms

Table 2q

Cleanup Unit 7C Mass Removal Calculation Worksheet

	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-03 / 0 - 0.5 / 12/1/2008	SB-03 / 1 - 2 / 12/1/2008	SB-32 / 0 - 0.5 / 12/1/2008	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Cleanup Unit 7C	**TPH (mg/kg)**					**TPH (mg/kg)**		2	2383	375.10	340292	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	18	5.4	320	Diesel-range	114.5					Diesel-range	38.95	85.89
	Oil-range	2,000	58	11	1,600	Oil-range	556.3					Oil-range	189.32	417.44
	cPAHs (ug/kg)					**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**329**	*6.9*	**396**	TTEC	**244.0**					TTEC	0.08	0.18
	PCBs (ug/kg)					**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	x	Total PCBs	NA					Total PCBs	NA	NA
	Metals (mg/kg)					**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	7	x	5	Arsenic	6					Arsenic	2.04	4.50
	Lead	250	43	x	53	Lead	48					Lead	16.33	36.02

	Number of samples used to calculate mean concentration	Number of samples exceeding Preliminary Cleanup Level	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary Cleanup Level
TPH (mg/kg)	3				
Diesel-range		0	320	5.4	NA
Oil-range		0	1600	11	NA
cPAHs (ug/kg)					
TTEC		2	396	7	362.5
PCBs (ug/kg)					
Total PCBs		0	NA	NA	NA
Metals (mg/kg)					
Arsenic		0	7	5	NA
Lead		0	38.3	7.1	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2r

Cleanup Unit 7D Mass Removal Calculation Worksheet

	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-84 0 - 0.5 10/26/2009	SB-84 2 - 3 10/26/2009	SB-85 0 - 0.5 10/26/2009	SB-85 2 - 3 10/26/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Cleanup Unit 7D	**TPH (mg/kg)**						**TPH (mg/kg)**		1.5	4839	571.27	518257	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	5.4	x	5.4	x	Diesel-range	5.4					Diesel-range	2.80	6.17
	Oil-range	2,000	11	x	24	x	Oil-range	17.5					Oil-range	9.07	20.00
	cPAHs (ug/kg)						**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**224**	*6.9*	**175**	*7.6*	TTEC	103					TTEC	0.05	0.12
	PCBs (ug/kg)						**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	x	x	Total PCBs	**NA**					Total PCBs	NA	NA
	Metals (mg/kg)						**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	7	x	7	x	Arsenic	**7.0**					Arsenic	3.63	8.00
	Lead	250	5	x	5	x	Lead	5.0					Lead	2.59	5.71

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)	4				
Diesel-range		0	5.4	5.4	NA
Oil-range		0	18	11	NA
cPAHs (ug/kg)					
TTEC		2	103	6.90	199.5
PCBs (ug/kg)					
Total PCBs		0	NA	NA	NA
Metals (mg/kg)					
Arsenic		0	7	7	NA
Lead		0	5	5	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

Table 2s

Cleanup Unit 7E Mass Removal Calculation Worksheet

	Sample ID:	Preliminary Cleanup Level	SB-91	SB-91	SB-42	SB-42	SB-42	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
	Sample ID Depth Interval:		0 - 0.5	2 - 3	0 - 0.5	1 - 2	2 - 3									
	Date Collected:		10/26/2009	10/26/2009	12/1/2008	12/1/2008	12/1/2008									
	Field QC:															
Cleanup Unit 7E	**TPH (mg/kg)**							**TPH (mg/kg)**		4	1481	466.24	422974	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	x	x	350	x	x	Diesel-range	350.0					Diesel-range	148.04	326.43
	Oil-range	2,000	x	x	420	x	x	Oil-range	420.0					Oil-range	177.65	391.72
	cPAHs (ug/kg)							**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**877**	**2,045**	**4,692**	**793**	*6.9*	TTEC	**1,683**					TTEC	0.71	1.57
	PCBs (ug/kg)							**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	x	*256*	x	Total PCBs	256					Total PCBs	0.11	0.24
	Metals (mg/kg)							**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	8	x	5	x	x	Arsenic	6.5					Arsenic	2.75	6.06
	Lead	250	18	x	14	x	x	Lead	16.0					Lead	6.77	14.92

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)	5				
Diesel-range		0	350	350	NA
Oil-range		0	420	420	NA
cPAHs (ug/kg)					
TTEC		4	1,683	6.90	2,102
PCBs (ug/kg)					
Total PCBs		0	256	256	NA
Metals (mg/kg)					
Arsenic		0	7	5	NA
Lead		0	16	14	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2t

Cleanup Unit 8 Mass Removal Calculation Worksheet

Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-89 / SS / 10/29/2009	SB-89 / 0 - 0.5 / 10/29/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)				**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	x	x	Diesel-range	NA					Diesel-range	NA	NA
Oil-range	2,000	x	x	Oil-range	NA					Oil-range	NA	NA
cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	**467**	**1,778**	TTEC	**1123**	2	2403	378.25	343148	TTEC	0.39	0.85
PCBs (ug/kg)				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	x	x	Total PCBs	NA					Total PCBs	NA	NA
Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
Arsenic	20	7	x	Arsenic	7					Arsenic	2.40	5.30
Lead	250	10	x	Lead	10					Lead	3.43	7.57

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2u

Cleanup Unit 9A Mass Removal Calculation Worksheet

	Sample ID: Sample ID Depth Interval: Date Collected: Field QC:	**Preliminary Cleanup Level**	SB-36 0 - 0.5 12/2/2008	SB-36 1 - 2 12/2/2008	**Mean Soil Concentrations**		**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
Cleanup Unit 9A	**TPH (mg/kg)**				**TPH (mg/kg)**		2	2199	346.14	314017	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	210	140	Diesel-range	175					Diesel-range	54.95	121.17
	Oil-range	2,000	520	330	Oil-range	425					Oil-range	133.46	294.27
	cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**223**	**267**	TTEC	**245**					TTEC	0.08	0.17
	PCBs (ug/kg)				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	*231*	Total PCBs	231					Total PCBs	0.07	0.16
	Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	12	x	Arsenic	12					Arsenic	3.77	8.31
	Lead	250	24	x	Lead	24					Lead	7.54	16.62

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2v

Cleanup Unit 9C Mass Removal Calculation Worksheet

	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SS-25 1.0 - 1.5 4/12/2007	SS-25 3.0 - 3.5 4/12/2007	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
Cleanup Unit 9C	**TPH (mg/kg)**				**TPH (mg/kg)**		4.5	703	248.98	225874	**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	150	140	Diesel-range	145					Diesel-range	32.75	72.22
	Oil-range	2,000	380	66	Oil-range	223					Oil-range	50.37	111.07
	cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	x	x	TTEC	NA					TTEC	NA	NA
	PCBs (ug/kg)				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	Total PCBs	NA					Total PCBs	NA	NA
	Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	**196**	**29.8**	Arsenic	**113**					Arsenic	25.50	56.23
	Lead	250	**444**	7.16	Lead	226					Lead	50.95	112.35

	Number of samples used to calculate mean concentration	Number of samples exceeding Preliminary Cleanup Level	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary Cleanup Level
TPH (mg/kg)	2				
Diesel-range		0	150	140	NA
Oil-range		0	380	66	NA
cPAHs (ug/kg)					
TTEC		0	NA	NA	NA
PCBs (ug/kg)					
Total PCBs		0	NA	NA	NA
Metals (mg/kg)					
Arsenic		2	196	29.8	113
Lead		1	444	7.16	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

		Preliminary Cleanup Level											
Cleanup Unit 9D	Sample ID:		LB2/MW-2	MW-5	MW-6	SB-10	SB-10	SB-11	SB-11	SB-12	SB-12	SB-13	SB-13	SB-14	SB-15
	Sample ID Depth Interval:		0 - 1	0 - 0.5	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	2 - 3	0 - 0.5	1 - 2	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5
	Date Collected:		3/7/2003	12/9/2008	12/9/2008	12/11/2008	12/11/2008	12/11/2008	12/11/2008	12/3/2008	12/3/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008
	Field QC:														
	TPH (mg/kg)														
	Diesel-range	2,000	25	13	14	240	x	32	x	110	x	6.8	x	6.0	5.1
	Oil-range	2,000	50	160	57	140	x	200	x	220	x	34	x	25	13
	cPAHs (ug/kg)														
	TTEC	140	x	63	18	**206**	*22.7*	**88**	x	**493**	8.9	128	*6.8*	16	126
	PCBs (ug/kg)														
	Total PCBs	1,000	x	x	x	x	x	x	x	x	x	x	x	x	x
	Metals (mg/kg)														
	Arsenic	20	3	9	6	**200**	6	**110**	5	**350**	11	10	x	6	5
	Lead	250	6.1	28	26	**294**	3	167	x	**355**	8	11	x	31	5

	Number of samples used to calculate mean concentration	Number of samples exceeding Preliminary Cleanup Level	Max concentration within Cleanup Unit	Min concentration within Cleanup Unit	Average concentration exceeding Preliminary Cleanup Level
TPH (mg/kg)	68				
Diesel-range		3	5500	5	4,600
Oil-range		2	652	10	14,050
cPAHs (ug/kg)					
TTEC		17	425	0.05	1,231.4
PCBs (ug/kg)					
Total PCBs		2	1,088	125	4,615
Metals (mg/kg)					
Arsenic		26	109	3	286
Lead		14	184	1.66	768

Notes:

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Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

SB-15 1 - 2 12/1/2008	SB-16 0 - 0.5 12/3/2008	SB-17 0 - 0.5 12/3/2008	SB-17 1 - 2 12/3/2008	SB-18 0 - 0.5 12/4/2008	SB-19 0 - 0.5 12/4/2008	SB-19 1 - 2 12/4/2008	SB-20 0 - 0.5 12/4/2008	SB-21 0 - 0.5 12/2/2008	SB-22 0 - 0.5 12/2/2008	SB-23 1 - 2 12/1/2008	SB-23 2 - 3 12/1/2008	SB-25 1 - 2 1/21/2009	SB-25 2 - 3 1/21/2009	SB-26 0 - 0.5 12/11/2008	SB-26 1 - 2 12/11/2008
5.2 10	25 64	43 190	x x	5 14	7.0 26	x x	5 10	5.6 14	5.8 12	x x	x x	x x	x x	**3,500** **2,100**	6.9 14
7.1	25	**439**	*7.1*	25	21	x	8.2	11	*7.2*	24	*90.6*	*98.2*	*98.2*	**3,692**	*6.9*
x	x	x	x	x	x	x	x	x	x	125	*224*	**5,800**	224	**3,430**	*217*
5 2	7 24	12 69	x x	5 21	6 **373**	x 2	5 3	6 8	6 3	x x	x x	x x	x x	**320** **775**	6 3

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

SB-26	SB-33	SB-33	SB-34	SB-35	SB-35	SB-36	SB-36	SB-36	SB-37	SB-38	SB-39	SB-40	SB-40	SB-41	SB-42
2 - 3	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	1 - 2	2 - 3	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1 - 2	0 - 0.5	0 - 0.5
12/11/2008	12/2/2008	12/2/2008	12/11/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/10/2008	12/10/2008	12/10/2008	12/1/2008
x	5.6	5.4	19	71	140	210	140	x	5.6	5.3	5.3	5	x	6.7	350
x	11	11	54	68	360	520	330	x	11	13	13	10	x	13	420
x	*6.9*	x	28	26	0.9	**223**	**267**	64	0.05	*7.2*	*7.2*	94	*7.2*	*7.1*	**4,692**
x	x	x	x	x	*231*	x	*231*	x	x	x	x	x	x	x	*256*
7	5	x	7	6	x	12	x	x	6	5	5	5	x	6	5
4	13	x	16	7	x	24	x	x	4	4	4	4	x	3	14

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

SB-42 1 - 2 12/1/2008	SB-42 2 - 3 12/1/2008	SB-43 1 - 2 10/28/2009	SB-43 2 - 3 10/28/2009	SS3 0 - 1 3/4/2003	SS4 0 - 1 3/4/2003	SS-1 1.0 - 1.5 4/2/2007	SS-2 1.0 - 1.5 4/2/2007	SS-4 1.0 - 1.5 4/2/2007	SS-6 1.0 - 1.5 4/2/2007	SS-7 1.0 - 1.5 4/2/2007	SS-8 1.0 - 1.5 4/2/2007	SS-9 1.0 - 1.5 4/2/2007	SS-10 1.0 - 1.5 4/2/2007	SS-11 1.0 - 1.5 4/2/2007	SS-12 1.0 - 1.5 4/2/2007
x x	x x	x x	x x	25 260	570 870	120 190	**5,500** **26,000**	810 1,800	68 30	26 36	220 590	30 110	140 460	25 120	220 570
793	*6.9*	x	*6.9*	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
x x	x x	**38** 67	**46** x	14 230	**84** 240	**21.9** 16.0	**24.8** 91.4	16.3 82.0	5.58 3.37	3.74 4.57	**89** **697**	9.54 11.3	**38.2** 190	**79.1** 79.3	**461** **810**

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

SS-13 1.0 - 1.5 4/2/2007	SS-14 1.0 - 1.5 4/12/2007	SS-15 1.0 - 1.5 4/2/2007	SS-16 1.0 - 1.5 4/2/2007	SS-17 1.0 - 1.5 4/12/2007	SS-18 1.0 - 1.5 4/12/2007	SS-19 1.0 - 1.5 4/12/2007	SS-20 1.0 - 1.5 4/12/2007	SS-21 1.0 - 1.5 4/12/2007	SS-22 1.0 - 1.5 4/12/2007	SS-23 1.0 - 1.5 4/12/2007	SS-24 1.0 - 1.5 4/12/2007	SS-26 1.0 - 1.5 4/12/2007	SS-27 1.0 - 1.5 4/12/2007	SS-28 1.0 - 1.5 4/12/2007	SS-30 1/21/2009
140 870	370 720	7.7 34	5.4 12	5.3 10	5.2 10	5.2 10	970 1,100	5.5 11	**4,800** 110	5.6 16	9.2 28	53 180	40 150	150 490	240 620
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	**1,709**
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
64.4 **604**	**687** **1,910**	5.51 2.21	5.78 5.21	3.82 1.85	2.99 1.66	4.31 2.00	3.19 3.97	4.31 2.09	2.57 2.06	4.70 4.06	6.87 4.00	4.46 3.90	**39.6** 45.5	**132** 189	**140** **330**

Table 2w

Cleanup Unit 9D Mass Removal Calculation Worksheet

SS-31	SS-32	SS-33	SS-34	SS-35	SS-36	SS-37	SS-38									
1/21/2009	1/6/2009	1/6/2009	1/21/2009	1/6/2009	1/6/2009	1/21/2009	1/6/2009	**Mean Soil Concentrations**		**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
								TPH (mg/kg)						**TPH**	**(kg)**	**(lbs)**
140	120	150	100	78	200	100	1,900	Diesel-range	329.2					Diesel-range	2640.04	5821.30
420	250	190	120	270	720	350	1,400	Oil-range	651.7					Oil-range	5226.68	11524.83
								cPAHs (ug/kg)						**cPAHs**	**(kg)**	**(lbs)**
2,217	**892**	**226**	**521**	**321**	**1,372**	**1,011**	**1,859**	TTEC	**425**	2.5	44932	8840.79	8020362	TTEC	3.41	7.52
								PCBs (ug/kg)						**PCBs**	**(kg)**	**(lbs)**
x	x	x	x	x	x	140	x	Total PCBs	**1,088**					Total PCBs	8.72	19.24
								Metals (mg/kg)						**Metals**	**(kg)**	**(lbs)**
2,220	**310**	**30**	**140**	**130**	**530**	**480**	**660**	Arsenic	**108.6**					Arsenic	871.02	1920.60
1,740	**380**	40	90	180	**799**	**810**	**881**	Lead	183.8					Lead	1474.32	3250.88

Table 2x

Cleanup Unit 9E Mass Removal Calculation Worksheet

	Sample ID:		MW-4	SB-14									
	Sample ID Depth Interval:	**Preliminary**	0 - 0.5	0 - 0.5									
	Date Collected:	**Cleanup Level**	12/9/2008	12/1/2008			**Unit Thickness**	**Unit Area (sq**					
	Field QC:				**Mean Soil Concentrations**		**(feet)**	**feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
	TPH (mg/kg)				**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
	Diesel-range	2,000	13	6.0	Diesel-range	9.5					Diesel-range	1.71	3.78
	Oil-range	2,000	110	25	Oil-range	67.5					Oil-range	12.18	26.87
	cPAHs (ug/kg)				**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
	TTEC	140	**172**	16	TTEC	**94**	1	2528	198.96	180499	TTEC	0.02	0.04
Cleanup Unit 9E	**PCBs (ug/kg)**				**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
	Total PCBs	1,000	x	x	Total PCBs	NA					Total PCBs	NA	NA
	Metals (mg/kg)				**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
	Arsenic	20	8	6	Arsenic	7.0					Arsenic	1.26	2.79
	Lead	250	18	31	Lead	24.5					Lead	4.42	9.75

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2y

Cleanup Unit 9F Mass Removal Calculation Worksheet

Cleanup Unit 9F

Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-24 / 1 - 2 / 1/6/2009	SB-24 / 2 - 3 / 1/6/2009	SB-24 / 3 - 4 / 1/6/2009	SS-5 / 1.0 - 1.5 / 4/2/2007	SS-5 / 3.0 - 3.5 / 4/2/2007
TPH (mg/kg)						
Diesel-range	2,000	570	99	140	720	**2,700**
Oil-range	2,000	**2,500**	240	110	**3,300**	**10,000**
cPAHs (ug/kg)						
TTEC	140	**3,890**	*95.1*	x	x	x
PCBs (ug/kg)						
Total PCBs	1,000	**9,200**	**1,200**	180	x	x
Metals (mg/kg)						
Arsenic	20	x	x	x	15.2	16.1
Lead	250	x	x	x	**305**	10.3

Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)		4.5	1532	542.58	492232	**TPH**	**(kg)**	**(lbs)**
Diesel-range	846					Diesel-range	416.33	918.01
Oil-range	**3230**					Oil-range	1589.91	3505.75
cPAHs (ug/kg)						**cPAHs**	**(kg)**	**(lbs)**
TTEC	**1993**					TTEC	0.98	2.16
PCBs (ug/kg)						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	**3527**					Total PCBs	1.74	3.83
Metals (mg/kg)						**Metals**	**(kg)**	**(lbs)**
Arsenic	16					Arsenic	7.70	16.99
Lead	158					Lead	77.60	171.11

	Number of samples used to calculate mean concentration	**Number of samples exceeding Preliminary Cleanup Level**	**Max concentration within Cleanup Unit**	**Min concentration within Cleanup Unit**	**Average concentration exceeding Preliminary Cleanup Level**
TPH (mg/kg)	5				
Diesel-range		1	2700	99	NA
Oil-range		3	10,000	110	5,267
cPAHs (ug/kg)					
TTEC		1	3,890	95	NA
PCBs (ug/kg)					
Total PCBs		2	9,200	180	5,200
Metals (mg/kg)					
Arsenic		0	16	15	NA
Lead		1	305	10.3	NA

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 2z

Cleanup Unit 10 Mass Removal Calculation Worksheet

Cleanup Unit 10D	Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-102-5	SB-102-11	SB-95-8	SB-96-8	SB-96-11	SB-97-7	SB-97-11	SB-97-14	SB-100-5	SB-100-10	SB-100-14
	Sample ID Depth Interval:		5	11	8	8	11	7	11	14	5	10	14
	Date Collected:		6/25/2010	6/25/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/25/2010	6/25/2010	6/25/2010
	Field QC:												
	TPH (mg/kg)												
	Diesel-range	2,000	**8,400**	**4,800**	**3,100**	**3,300**	**2,100**	5.6	96	**2,800**	**2,000**	**4,600**	**2,800**
	Oil-range	2,000	350	200	110	260	140	11	13	110	100	210	180
	cPAHs (ug/kg)												
	TTEC	140	x	x	x	x	x	x	x	x	x	x	x
	PCBs (ug/kg)												
	Total PCBs	1,000	x	x	x	x	x	x	x	x	x	x	x
	Metals (mg/kg)												
	Arsenic	20	x	x	x	x	x	x	x	x	x	x	x
	Lead	250	x	x	x	x	x	x	x	x	x	x	x

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

Table 2z

Cleanup Unit 10 Mass Removal Calculation Worksheet

SB-101-5 5 6/25/2010	SB-101-15 15 6/25/2010	SB-94 5 6/24/2010	SB-94 10 6/24/2010	**Mean Soil Concentrations**		**Unit Thickness (feet)**	**Unit Area (sq feet)**	**Soil Mass (tons)**	**Soil Mass (kg)**	**Contaminant Mass in Cleanup Unit**		
				TPH (mg/kg)		12	1857	1753.83	1591078	**TPH**	**(kg)**	**(lbs)**
2,000	**3,100**	53	200	Diesel-range	**2,624**					Diesel-range	4174.41	9204.58
77	190	380	12	Oil-range	156					Oil-range	248.53	548.00
				cPAHs (ug/kg)						**cPAHs**	**(kg)**	**(lbs)**
x	x	x	x	TTEC	NA					TTEC	NA	NA
				PCBs (ug/kg)						**PCBs**	**(kg)**	**(lbs)**
x	x	x	x	Total PCBs	NA					Total PCBs	NA	NA
				Metals (mg/kg)						**Metals**	**(kg)**	**(lbs)**
x	x	x	x	Arsenic	NA					Arsenic	NA	NA
x	x	x	x	Lead	NA					Lead	NA	NA

Table 2aa

Cleanup Unit 11 Mass Removal Calculation Worksheet

Cleanup Unit 11A

Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	SB-48 / 0 - 0.5 / 11/25/2009	Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)							**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	x					Diesel-range	NA	NA
Oil-range	2,000	x					Oil-range	NA	NA
cPAHs (ug/kg)							**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	**365**	1.5	1272	150.17	136231	TTEC	0.05	0.11
PCBs (ug/kg)							**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	x					Total PCBs	NA	NA
Metals (mg/kg)							**Metals**	**(kg)**	**(lbs)**
Arsenic	20	**40**					Arsenic	5.45	12.02
Lead	250	112					Lead	15.26	33.64

Cleanup Unit 11B

Sample ID: / Sample ID Depth Interval: / Date Collected: / Field QC:	Preliminary Cleanup Level	MW-9 / 0 - 0.5 / 12/8/2008	MW-9 / 1 - 2 / 12/8/2008	MW-9 / 2 - 3 / 12/8/2008	SB-49 / 0 - 0.5 / 11/25/2009	Mean Soil Concentrations		Unit Thickness (feet)	Unit Area (sq feet)	Soil Mass (tons)	Soil Mass (kg)	Contaminant Mass in Cleanup Unit		
TPH (mg/kg)						**TPH (mg/kg)**						**TPH**	**(kg)**	**(lbs)**
Diesel-range	2,000	74	x	x	x	Diesel-range	74					Diesel-range	17.68	38.98
Oil-range	2,000	350	x	x	x	Oil-range	350					Oil-range	83.62	184.37
cPAHs (ug/kg)						**cPAHs (ug/kg)**						**cPAHs**	**(kg)**	**(lbs)**
TTEC	140	**1,758**	111	**162**	88	TTEC	**530**	3.5	956	263.34	238904	TTEC	0.13	0.28
PCBs (ug/kg)						**PCBs (ug/kg)**						**PCBs**	**(kg)**	**(lbs)**
Total PCBs	1,000	520	*210*	x	39	Total PCBs	256					Total PCBs	0.06	0.14
Metals (mg/kg)						**Metals (mg/kg)**						**Metals**	**(kg)**	**(lbs)**
Arsenic	20	**510**	10	x	**30**	Arsenic	**183**					Arsenic	43.80	96.58
Lead	250	**619**	12	x	82	Lead	238					Lead	56.78	125.20

Notes:

All data qualifiers are stripped from concentration values (thus 'U' flagged values now equal the detection limit)

'NA' values where a compound wasn't analyzed, have been reduced to null values (shown as x) so as not to affect calculated means

Only samples within the proposed excavation depth range are shown and included in calculations of mean soil concentrations

Yellow highlighted samples exceed preliminary cleanup levels within an individual unit

Estimated concentrations of PCBs or cPAHs are italicized where a sum of detection limits (for PCBs) or a TTEC based on detection limits is calculated

kg - kilograms

lbs - pounds

mg - milligrams

ug - micrograms

Table 3
Contaminant Mass Removal Summary

	Mass of contaminants (pounds)					
	TPH		cPAHs	PCBs	Metals	
Cleanup Unit	**Diesel-range**	**Oil-range**	**TTEC**	**Total PCBs**	**Arsenic**	**Lead**
1A	2.10	7.59	0.07	0.03	2.76	8.27
1B	NA	NA	0.02	0.50	9.97	116.29
1C	1.91	7.09	0.01	NA	1.64	101.65
1D	3.95	12.49	0.38	0.02	3.50	4.99
UNIT 1	7.96	27.16	0.47	0.54	17.86	231.22
UNIT 2	89.11	293.81	0.49	NA	227.34	284.66
3A	79.65	284.90	1.02	0.96	229.45	321.64
3B	48.63	132.38	0.77	0.72	299.88	343.11
3C	14.13	82.43	0.09	NA	11.19	24.73
3D	117.19	657.01	0.70	1.60	265.33	368.94
3E	2.39	5.16	0.15	0.09	2.58	1,705.70
UNIT 3	261.99	1,161.89	2.73	3.37	808.43	2,764.12
4A	2.58	5.74	0.07	NA	3.35	9.57
4B	12.79	38.30	0.07	0.08	4.37	99.22
4C	11.60	35.04	0.09	0.14	3.80	64.64
UNIT 4	26.97	79.08	0.24	0.22	11.52	173.43
5A	86.36	253.33	0.48	1.49	178.48	270.03
5B	50.52	164.69	0.35	24.24	81.23	612.68
UNIT 5	136.88	418.01	0.82	25.73	259.71	882.71
6A	20.69	39.67	0.26	0.23	4.82	20.12
6B	33.71	347.22	0.03	0.04	2.10	9.16
6C	1,935.43	21,425.82	0.18	0.42	10.52	45.01
UNIT 6	1,989.82	21,812.71	0.47	0.69	17.44	74.29
7A	NA	NA	0.22	17.16	10.31	30.47
7B	21.46	59.68	0.31	0.23	10.99	17.27
7C	85.89	417.44	0.18	NA	4.50	36.02
7D	6.17	20.00	0.12	NA	8.00	5.71
7E	326.43	391.72	1.57	0.24	6.06	14.92
UNIT 7	439.95	888.83	2.40	17.63	39.86	104.39
UNIT 8	NA	NA	0.85	NA	5.30	7.57
9A	121.17	294.27	0.17	0.16	8.31	16.62
9B	0.00	0.00	0.00	0.00	0.00	0.00
9C	72.22	111.07	NA	NA	56.23	112.35
9D	5,821.30	11,524.83	7.52	19.24	1,920.60	3,250.88
9E	3.78	26.87	0.04	NA	2.79	9.75
9F	918.01	3,505.75	2.16	3.83	16.99	171.11
UNIT 9	6,936.47	15,462.78	9.89	23.23	2,004.91	3,560.70
UNIT 10	9,204.58	548.00	NA	NA	NA	NA
11A	NA	NA	0.11	NA	12.02	33.64
11B	38.98	184.37	0.28	0.14	96.58	125.20
UNIT 11	38.98	184.37	0.39	0.14	108.59	158.84
SITE WIDE TOTAL	19,132.72	40,876.65	18.75	71.53	3,500.95	8,241.93

Alternative 1: Cleanup units 5B, 7A & 10

Total mass removed (lbs)	9,255.10	712.69	0.57	41.40	91.54	643.15
Total mass removed (%)	48.37%	1.74%	3.02%	57.88%	2.61%	7.80%

Alternative 2: Alt 1 + Cleanup units 2, 3D, 9C, 9D & 9F

Total mass removed (lbs)	16,272.92	16,805.15	11.43	66.07	2,578.02	4,831.08
Total mass removed (%)	85.05%	41.11%	60.99%	92.36%	73.64%	58.62%

Alternative 3: Alt 2 + Cleanup units 1, 3A, 3B, 3C, 3E, 4, 5A, 6, 7B, 7C, 7D, 7E, 8, 9A, 9B & 9E

Total mass removed (lbs)	19,093.74	40,692.27	18.36	71.40	3,392.36	8,083.09
Total mass removed (%)	99.80%	99.55%	97.93%	99.81%	96.90%	98.07%

Alternative 4: Alt 2 + Cleanup units 3A, 3B, 3C, 3E, 5A, 6A, 6B, 6C, 7B, 7C, 7D, 7E, 9A & 9E

Total mass removed (lbs)	19,058.81	40,586.04	16.80	70.64	3,357.68	7,670.87
Total mass removed (%)	99.61%	99.29%	89.61%	98.75%	95.91%	93.07%

Notes:
TPH - total petroleum hydrocarbons
cPAH - carcinogenic polycyclic aromatic hydrocarbons
PCBs - Polychlorinated biphenyls
TTEC - Total toxicity equivalent concentration
NA - constituent was not analyzed for
lbs - pounds
% - percent

APPENDIX J

SIMPLIFIED TERRESTRIAL ECOLOGICAL EVALUATION TABLE

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) <u>undeveloped land</u> on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
<u>Area (acres)</u> / <u>Points</u>: 0.25 or less – 4; 0.5 – 5; 1.0 – 6; 1.5 – 7; 2.0 – 8; 2.5 – 9; 3.0 – 10; 3.5 – 11; 4.0 or more – 12	4
2) Is this an <u>industrial</u> or <u>commercial</u> property? If yes, enter a score of 3. If no, enter a score of 1	1
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	1
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	7

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early <u>successional</u> vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]