City of Seattle

LOWER DUWAMISH WATERWAY SLIP 4 EARLY ACTION AREA

LONG-TERM MONITORING DATA REPORT YEAR 2 (2014)

Submitted to
U.S. Environmental Protection Agency
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ACRONYMS AND ABBREVIATIONS

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-*p*-dioxin
BEHP	bis(2-ethylhexyl) phthalate
Boeing	The Boeing Company
CFR	Code of Federal Regulations
City	City of Seattle
CSL	cleanup screening level
DAHP	Washington State Department of Archaeology and Historic Preservation
DeNovo	DeNovo Seattle Inc. LLC
dioxin/furan	dibenzo-*p*-dioxin and dibenzofuran
DSOA	Duwamish Sediment Other Area
EAA	early action area
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation and cost analysis
EPA	U.S. Environmental Protection Agency
GTSP	Georgetown Steam Plant
ICIR	institutional controls implementation report
Integral	Integral Consulting Inc.
LDW	Lower Duwamish Waterway
LAET	lowest apparent effects threshold
LTMRP	long-term monitoring and reporting plan
LTST	long-term stormwater treatment
MLLW	mean lower low water
NBF	North Boeing Field
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PLP	potentially liable party
QAPP	quality assurance project plan
RACR	removal action completion report

RAO	removal action objective
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation and feasibility study
RNA	regulated navigation area
SAP	sampling and analysis plan
SEPA	State Environmental Policy Act
SQS	sediment quality standards
SVOC	semivolatile organic compound
TEQ	toxicity equivalent
TOC	total organic carbon
VOC	volatile organic compound
USCG	U.S. Coast Guard

REPORT CERTIFICATION

The following certification is provided pursuant to the Administrative Settlement Agreement and Order on Consent for Removal Action, Appendix A, Statement of Work, Task 5 – Long-Term Monitoring and Reporting Plan.

CITY OF SEATTLE—PROJECT MANAGER CERTIFICATION

I, Allison Crowley, City of Seattle Project Manager for the long-term monitoring work conducted at the Slip 4 Early Action Area, Lower Duwamish Waterway Superfund Site, hereby provide the following certification:

Under penalty of perjury under the laws of the United States, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Allison Crowley

Allison Crowley
Project Manager
City of Seattle

12-19-2014
Date

1 INTRODUCTION

This report describes the activities and results associated with the Year 2 (2014) monitoring of the long-term effectiveness of the Slip 4 Early Action Area (EAA) cleanup within the Lower Duwamish Waterway (LDW) Superfund site in Seattle, Washington (Figure 1-1). All Year 2 monitoring activities were carried out by Integral Consulting Inc. (Integral) in accordance with the Long-Term Monitoring and Reporting Plan (LTMRP; Integral 2013a), which was prepared in accordance with the requirements set forth in the Slip 4 EAA Administrative Settlement Agreement and Order on Consent and associated Scope of Work (CERCLA Docket No. 10-2006-0364) and Action Memorandum (USEPA 2006).

Slip 4 is a 6.4-acre navigational slip located 3 miles upstream from the northern boundary of the LDW, which is located at the southern end of Harbor Island. It is one of five priority early action sites identified within the 5.5-mile-long LDW Superfund site. The EAA contains 3.58 acres within the slip in which sediments were contaminated with polychlorinated biphenyls (PCBs), metals, organic compounds, and petroleum products.

1.1 SEDIMENT CLEANUP ACTION

The City of Seattle (City) completed a non-time-critical removal action to address contaminated sediment at the Slip 4 EAA on February 7, 2012 (Integral 2012). The primary objective of the Slip 4 removal action was to reduce the concentrations of PCBs and other chemicals in the post-cleanup surface sediments to below the Washington State Sediment Quality Standards (SQS). The primary design and construction elements included:

- Dredging and excavation of approximately 10,256 cubic yards of contaminated bottom sediment and bank soil
- Transloading and disposal of 17,334 tons of soil, sediment, and debris in a Subtitle D landfill, including approximately 130 tons of creosote-treated timbers and piles
- Demolition of 20,019 square feet of concrete pier structure
- Recycling of 3,278 tons of concrete and 79 tons of steel
- Construction of stable slopes, sediment caps, and slope caps over 3.43 acres using 53,006 tons of clean material
- Construction of engineered soil covers and expanded habitat in former upland areas.

The construction of sediment and slope caps following the removal of contaminated sediment and soil, in conjunction with the engineered soil covers and habitat enhancements, resulted in clean material placement over all remaining contaminated soils and sediments within the Slip 4

EAA (Figure 1-2). Overall, the cleanup resulted in a net gain of more than an acre of shallow and riparian habitat for threatened Puget Sound Chinook and Coastal/Puget Sound bull trout.

The 2012 post-construction surface sediment confirmation sampling results from the slope and waterway cap areas verified that surface sediment characteristics within the Slip 4 EAA met the removal action objective (RAO) after construction (Integral 2012). However, post-construction sampling outside of the Slip 4 EAA (within the boundary area [location shown in Figure 1-2]) revealed that surface sediment PCB concentrations had increased within the boundary area during the course of construction activity. The U.S. Environmental Protection Agency (EPA)-approved response was the placement of a 9-inch nominal lift of waterway cap material (referred to as "boundary area material") over the boundary area sediments. Subsequent sampling was performed to document surface conditions following boundary area material placement. The results indicated that, after placement of the boundary area material, PCB concentrations within the surface sediment met the RAOs. Details of the construction activities are summarized in the Removal Action Completion Report (RACR; Integral 2012), approved by EPA in July 2012.

The 2012 post-boundary area material placement sampling results and 2012 Slip 4 EAA post-construction confirmation sampling results represent the baseline conditions for the Slip 4 EAA long-term monitoring program, which is designed to identify potential concerns with the long-term performance of the remedy in the Slip 4 EAA. Hereinafter, any reference to 2012 post-boundary area material placement and post-construction confirmation sampling data will be referred to as "baseline" in this report.

1.2 SOURCE CONTROL ACTIONS

Potential sources of chemicals to Slip 4 were evaluated in the Slip 4 engineering evaluation and cost analysis (EE/CA; Integral 2006), including bank erosion and outfalls. The EE/CA addressed bank erosion by including actions to stabilize and contain the banks as part of the Slip 4 remedy. Potentially significant ongoing sources of PCBs and phthalates to Slip 4 were identified in upland drainage systems discharging to Slip 4.

A number of actions were undertaken following the EE/CA and prior to the Slip 4 EAA cleanup to reduce the potential for stormwater to result in recontamination of the Slip 4 sediment surface. Actions included the following:

1. The Georgetown Steam Plant (GTSP) flume was removed in 2009 and replaced with a 12-inch closed pipe. A small area of the property, primarily consisting of the main building roof, drains to this new pipe that discharges to Slip 4. Numerous side connections to the flume were disconnected during installation of the new storm drain pipe. As part of the flume removal, sediments from within the flume and PCB

contaminated soils immediately surrounding the flume were removed and disposed offsite.

2. Soil containing elevated concentrations of PCBs was excavated from the North Boeing Field (NBF) and GTSP properties. Soil with elevated concentrations of total petroleum hydrocarbons was also removed from the GTSP property. Site restoration activities completed at GTSP following these removal actions have minimized offsite runoff from GTSP, with the majority of site stormwater now managed through onsite infiltration (Integral 2011).
3. The majority of stormwater generated on NBF is treated via a long-term stormwater treatment (LTST) system (built by Boeing in 2011) prior to discharge to Slip 4. The design of the LTST is such that very small particles may pass through the LTST and be discharged to Slip 4, although particles of this size are not expected to settle in Slip 4 (Landau 2013). An update of the performance of the LTST is provided in Section 3.2.2.

Source control actions following the Slip 4 EAA 2012 cleanup have included:

- The initiation of a state remedial investigation and feasibility study (RI/FS) at the NBF/GTSP Model Toxics Control Act site
- Dredging associated with the Boeing Plant 2 Duwamish Sediment Other Area (DSOA) Corrective Measure in the LDW immediately upriver from Slip 4
- The initiation of a state RI/FS at the Crowley Marine Services Inc. 8th Avenue South site (Ecology Facility Site ID 1940187) adjacent to Slip 4. This site was referred to in the Slip 4 Year 1 Long-Term Monitoring report as Eighth Avenue Terminals (Integral 2014). In this Year 2 report, the site is referred to as the Crowley site.

Updates on these projects are provided in Section 3.2.

1.3 MONITORING OBJECTIVES

Hazardous substances remain onsite in Slip 4 EAA sediments and soils at levels greater than those that allow for unrestricted use or unlimited exposure. These remaining hazardous substances are physically and chemically isolated beneath an engineered sediment cap and soil cap. Long-term monitoring is being performed to verify that the remedy at the Slip 4 EAA remains protective of human health and the environment.

The long-term success of the sediment removal action for the Slip 4 EAA will be verified by monitoring endpoints that directly relate to the RAO for the cleanup. The RAO for Slip 4 is to reduce the concentration of contaminants in post-cleanup surface sediments (biologically active zone [0–10 cm]) to below the Washington State SQS for total PCB Aroclors and other chemicals of interest, thereby reducing risks to human health and the environment resulting from

potential exposure to contaminants in the Slip 4 EAA sediments (USEPA 2006). While the removal boundary for the early action implementation in Slip 4 was established to include sediments exceeding the SQS (USEPA 2006), the entire EAA (including soil banks and sediments) was capped with clean material.

The SQS for total PCB Aroclors is 12 mg/kg OC [milligrams per kilogram, organic carbon-normalized] when the total organic carbon (TOC) content is between 0.5 and 4.0 percent. Similarly, the Washington State cleanup screening level (CSL) for total PCB Aroclors is 65 mg/kg OC. When TOC is less than 0.5 percent or greater than 4.0 percent, regulatory comparisons are made to the lowest apparent effect threshold concentration (130 μg/kg dry weight) and the CSL established for the LDW site-wide cleanup (1,300 μg/kg dry weight).

The Slip 4 removal action design included dredging and excavation to target elevations to remove the most highly contaminated sediments, create stable slopes, and improve and expand habitat. The removal action was not designed to remove all sediment exceeding the SQS. Accordingly, the design called for placement of engineered sediment and soil caps to physically and chemically isolate contaminants that may have been left behind. Cap material thickness varies from 24 to 33 inches for slope cap and soil cover areas, and from 30 to 60 inches for waterway cap areas. Sediment/soil removal areas and cap placement designs are shown in Figure 1-2.

Specific study questions to be answered by the monitoring program are as follows:

- Are contaminant concentrations in Slip 4 EAA surface sediments (0–10 cm) below the SQS?
- Is the physical integrity of the cap in the Slip 4 EAA being maintained such that the sediment cap continues to isolate contaminants in underlying sediments from marine biota?
- Do the institutional controls associated with the Slip 4 EAA remedy remain in place and continue to work effectively?
- Are physical changes occurring related to sediment erosion and sediment deposition in the Slip 4 EAA?

Informational inputs designed to address these specific study questions are provided in Table 1-1.

In accordance with the long-term monitoring schedule (Table 1-2), Year 2 monitoring included the following:

- Storm flow monitoring—a summary of 100-year storm events during the Year 2 monitoring period (July 2013 through July 2014)

- Visual inspection
- Institutional control updates
- Review of physical construction/investigations by others.

Per the long-term monitoring schedule, Year 2 monitoring did not include sediment and soil sampling in the Slip 4 EAA.

1.4 SUMMARY OF YEAR 1 LONG-TERM MONITORING

Year 1 (2013) monitoring results indicated that the sediment and slope caps throughout the Slip 4 EAA were performing as designed, isolating underlying contaminated sediments (Integral 2014). Fine sediment has accumulated on the sediment cap in most of the EAA except near the head of the slip, with accumulations ranging from 0 to 8 cm in the EAA and up to 10 cm between the EAA and the mouth of the slip. There were two minor SQS exceedances within the waterway cap area. The total PCB concentration at location WC-3 was 12.3 mg/kg OC compared to the SQS of 12 mg/kg OC (Integral 2014). The bis(2-ethylhexyl) phthalate (BEHP) concentration at location WC-1 was 47.9 mg/kg OC compared to the SQS of 47 mg/kg OC. Based on observations from the visual survey, evaluation of potential sources of depositional sediments, and 2013 data (AMEC 2013) collected in Slip 4 and in the LDW by others, the most likely source of fine sediments that deposited on the cap is resuspended sediments from beyond the Slip 4 EAA.

1.5 REPORT ORGANIZATION

The remainder of this report is organized as follows:

- Section 2—Monitoring Activities
- Section 3—Results and Conclusions
- Section 4—References.

Figures and tables summarizing each monitoring element are presented at the end of the text. Appendices provide supporting project documentation and are organized as follows:

- Appendix A—Rain Gauge and Tide Data
- Appendix B—Visual Inspection Field Forms and Copies of Logbook Pages
- Appendix C—Visual Inspection Photographs
  - Appendix C1—Year 2 (2014)
  - Appendix C2—Prior Years

  - Appendix C3—Year 2 (2014) Photos in JPEG Format (on CD)
- Appendix D—Boeing Perimeter Monitoring Sample Results from AMEC (2014)
- Appendix E—Crowley Site Sample Result Tables from SLR (2014a,b)

2 MONITORING ACTIVITIES

2.1 STORM FLOW MONITORING

The Slip 4 LTMRP requires an evaluation of whether stormwater flows have the potential to erode the Slip 4 EAA cap. Erosion of the cap is not expected as a result of peak river flows or stormwater discharge into the slip. The water level of the LDW is controlled by the Howard A. Hanson Dam, and thus does not flood during high flow events. Further, Slip 4 is an off-channel feature of the LDW, and currents within the EAA are not expected to be significantly affected by changes in river flow. In addition, the cap and associated armoring was conservatively sized to accommodate unimpeded flow from outfalls within the slip from a 100-year storm event during an extreme low tide.

To verify cap performance during high-flow events, stormwater flow monitoring was conducted, focusing on 100-year storm events. For the project site area, the 100-year storm event corresponds to 3.85 inches of rainfall within a 24-hour period, as measured from the Seattle Public Utility rain gauge (Station 45-S016, Metro King County, E. Marginal Way). If rainfall meeting a 100-year storm event were to occur during the monitoring reporting period, tidal elevations below 5.2 feet mean lower low water (MLLW), corresponding to the invert elevation of the largest outfall within Slip 4 (the 72-inch diameter Interstate 5 outfall; Figure 2-1), would be documented and summarized for the 48-hour period following the storm event to evaluate whether storm-related outfall discharge may have impacted the cap during heavy rainfall events followed by low tide conditions.

Rain gauge data for Station 45-S016 was obtained from Seattle Public Utilities (Peck 2014, pers. comm.). Predicted tide data[1] for the Duwamish Waterway, Eighth Ave. South tide station 9447029 was downloaded directly from the National Oceanic and Atmospheric Administration's Tides and Currents website (NOAA 2014). Rain gauge for the Year 2 monitoring period (July 23, 2013–July 22, 2014), along with predicted tide data from July 2013 through 2014, are provided in Appendix A. No 100-year storm events occurred within the Slip 4 EAA Year 2 monitoring period. The maximum daily total rainfall was 1.53 inches, recorded on March 5, 2014 (Appendix A). Consequently, no further evaluation of potential stormwater-induced erosion to the cap was performed.

[1] The Duwamish Waterway, Eighth Ave. South tide station is a subordinate station referencing the Seattle (Madison St.), Elliott Bay station (ID: 9447130). No observed data are available from the 8th Avenue South tide station.

2.2 VISUAL INSPECTION

The visual inspection is performed to document the general condition of the cap, identify any obvious changes in bathymetry/topography resulting from erosion or sedimentation processes, identify any visible breaches of the cap integrity, and note the condition of the constructed habitat features (e.g., integrity of anchored woody debris).

2.2.1 Site Inspection

The visual inspection for the Year 2 monitoring was conducted in accordance with the quality assurance project plan (QAPP; LTMRP, Appendix A, Integral 2013a), and included still color photographs of the Slip 4 EAA sediments exposed during the extreme low tide on July 12, 2014. The tide level at the time that most photos were taken is estimated to be –3 feet MLLW, based on the predicted tide curve for the Eighth Ave. South tide station (#9447029). Photographs were taken from vantage points consistent with those used to document post-capping conditions, using a 14 megapixel digital camera with a 5× wide angle zoom lens with a focal length of 5 to 25.0 mm (Olympus Stylus Tough 8010). The locations of the photo stations are shown on Figure 2-1 and are listed along with their target coordinates, photo azimuth, photo numbers, and target areas in Table 2-1. Station locations were located via the rebar stakes that were placed during the Year 1 inspection. All but one stake, at Station F, were still standing. Although the stake at Station F was lying on its side, it was determined that it was still at approximately the original location, based on the observation that the view from its location matched the target view for the photos to be taken. The stake was not repositioned because of time constraints imposed by the rising tide.

Visual inspection forms were used to document conditions of the areas represented by the photographs and are provided in Appendix B, along with the site map used during monitoring. The approach for this year's monitoring was altered slightly from last year in that visual inspection forms were filled out individually for each area identified as a target at the long-term monitoring photo stations, rather than for the photo as a whole, in order to acquire better detail regarding conditions in the individual areas.

Year 2 visual inspection photographs (Appendix C1) were compared with photographs taken from similar vantage points documenting 2013 Year 1 conditions and 2012 post-capping conditions following completion of the EAA remedy (Appendix C2). An additional photograph was taken of the upland northeast pocket beach for comparison with future monitoring events, and is included in Appendix C1.

Year 2 cap observations are summarized in Table 2-2 and discussed in Section 3.

2.2.2 Field Deviations

Only one deviation from the QAPP was noted during the Year 2 visual monitoring event. The orientation for Photo B1 varied by approximately 10 degrees from the target azimuth due to a mathematical error made in the field when converting the target true north azimuth of 48 degrees to magnetic north for use with the field compass (i.e., by subtracting the approximately 16 degree magnetic declination). The magnetic north azimuth of the photo was approximately 22 degrees, but should have been 32 degrees.

2.2.3 Investigation-Derived Waste

Investigation-derived waste was handled in accordance with the QAPP (LTMRP, Appendix A; Integral 2013a). Disposable materials used during the site visit, such as paper towels and disposable nitrile gloves, were removed from the site by the field personnel and placed in a normal refuse container for disposal at a solid waste landfill. Phosphate-free, detergent-bearing liquid waste from decontamination of the equipment (ruler, spoon) and personnel boots following the visual inspection was disposed on site.

2.3 INSTITUTIONAL CONTROLS

Institutional controls are required at the Slip 4 EAA because some hazardous substances remain onsite at levels that do not allow for unrestricted use of the property (USEPA 2006). An institutional control implementation plan was developed and presented in the final design analysis report (Integral 2010) and further developed in the RACR (Integral 2012).

Table 2-3 summarizes the current status of the institutional controls for the Slip 4 EAA. Implementation of institutional controls is documented in a report that was approved by EPA on November 27, 2013 (Institutional Controls Implementation Report [ICIR]; Integral 2013b). The ICIR documents the implementation of each institutional control, including copies of all relevant paperwork (i.e., easements, covenants, state registries, and public advisories). Addendum 1 to the ICIR (SCL 2014a) contains the final Boeing Company Environmental Covenant and was submitted to and approved by EPA on January 14, 2014. Addendum 2 to the ICIR (SCL 2014b), approved by EPA on March 17, 2014, provides documentation of the lot line boundary adjustment filed with the King County Recorder reflecting the City's purchase of a 0.23-acre area on south shoreline of the Slip 4 EAA, previously owned by First South Properties, LLC. Due to discovery of an error on the recorded Lot Line Adjustment Deed, a revised copy was recorded with the County on April 1, 2014, and sent to EPA for its files on April 9 (Crowley 2014, pers. comm.).

Addendum 3 to the ICIR (SCL 2014c) documents the establishment of the Slip 4 Regulated Navigation Area (RNA). An RNA is a water area within a defined boundary for which regulations for vessels navigating within the area have been established under the Code of

Federal Regulations (CFR) 22 Part 165. The City applied for an EPA-sponsored RNA demarcation for the sediment cap in Slip 4. The RNA is intended to protect the integrity of the Slip 4 EAA sediment cap by prohibiting activities that will disturb the cap surface, such as anchoring, grounding, or spudding. It will not affect vessel transit or navigation of the area. The RNA was approved by the Seattle City Council on July 8, 2013, as part of Ordinance 124219, which was signed by the Mayor of Seattle on July 16, 2013, and filed with the City Clerk on July 17, 2013 (Integral 2013b). The draft Proposed Rule regarding the RNA was published in the Federal Register on April 22, 2014, with a public comment period that ended on July 21, 2014. The Final Rule for the RNA was published in the Federal Register on October 21, 2014, and became effective on November 20, 2014. Addendum 3 to the ICIR (SCL 2014c) was approved by EPA on November 20, 2014. The RNA and its regulations will also be described in the Notice to Mariners and in updates of the Coast Pilot under the specific CFR reference number (i.e., CFR-165-1338). The RNA will also be indicated in magenta-colored hashing on navigational charts of Slip 4, and will include the CFR reference number.

Institutional controls also include signs at the mouth of Slip 4 and near the cap boundaries to notify vessel operators of the presence of the sediment cap and the prohibition against its disturbance. The signs were installed on August 19, 2013; however, the last four digits of the RNA CFR number (i.e., 1338) were not known until the final rule was published in the Federal Register. Those numbers were installed on the notification signs on November 20, 2014, as documented in Addendum 3 to the ICIR (SCL 2014c).

2.4 YEAR 2 OTHER INVESTIGATIONS

In accordance with the LTMRP, investigations and construction activities controlled by others within the vicinity of Slip 4 that took place within the Year 2 monitoring period (July 2013 through July 2014) were reviewed to assess any effects on the performance of the Slip 4 EAA remedy.

The following projects potentially affecting the EAA were reviewed:

- NBF RI/FS
- NBF LTST results from the second year of LTST operation
- Boeing Plant 2 DSOA Corrective Measure
- Crowley site RI/FS.

These investigations are summarized in Section 3.2.

3 RESULTS AND CONCLUSIONS

Long-term monitoring data for the Slip 4 EAA were evaluated by analyzing spatial and temporal trends in the physical characteristics of the sediments and shoreline soils. The 2012 post-construction data compiled in the RACR (Integral 2012) provide a baseline for comparison to long-term monitoring program results. The physical characteristics of the Slip 4 EAA and temporal changes identified during the Year 2 monitoring are described below. Temporal changes were evaluated to identify recommendations for subsequent monitoring events.

3.1 PHYSICAL CHARACTERISTICS

The physical characteristic of concern for the Slip 4 EAA remedy is the integrity of the cap. Mechanisms for potential adverse impacts to the cap include the following:

- Sloughing of cap material in sloped areas (located onshore and nearshore) caused by erosion or seismic (earthquake) activity
- Erosion of waterway cap material and armoring due to outfall discharge
- Breaching of the sediment cap either onshore or within the waterway caused by man-made events, such as vessel groundings, prop scour, or other unauthorized physical disturbances.

Other physical characteristics and processes of interest at the Slip 4 EAA include the following:

- Deposition of sediments from offsite sources on the sediment cap
- Evidence of recontamination
- Changes to shoreline development along the perimeter of the Slip 4 EAA
- Changes to constructed habitat features
- Reestablishment of intertidal aquatic habitat
- Accumulation of organic matter and man-made litter
- Wildlife usage.

For the Year 2 monitoring, the visual inspection was the primary means of assessing cap integrity, sediment deposition, changes in constructed habitat features, and changes to shoreline development. Photographs and field notes from the Year 2 visual inspection were compared to baseline and Year 1 monitoring photographs and field notes to evaluate temporal changes. Year 2 visual inspection field notes are summarized in Table 2-2 and photographs are presented in Appendix C1. Year 2 monitoring field forms and copies of the logbook pages are presented in Appendix B.

Based on field notes and photographs, Year 2 visual observations included the following (Table 2-2 and Appendix C1):

- Increased vegetation was observed in the pocket beaches.
- Accumulation of fine sediment, generally on the order of 1–2 mm or less in depth, was observed at low tide throughout the Slip 4 EAA on the slope cap areas below the high tide line (Table 2-2). Accumulations of 0–1 cm or more were observed in areas of the exposed sediment cap. The thickest accumulation (up to 18 cm) observed was within the central portion of the armored outfall slough. A discussion of fine sediment accumulation within Slip 4 is provided below.
- Small woody debris (sticks, twigs, and trace leaf litter) was scattered throughout the EAA.
- Trace litter and plastic debris were observed in most areas except the northwest slope cap and east-central, north, west, and south sediment cap.
- Algae growth was again observed along the entire intertidal area.
- Evidence of reestablishment of intertidal aquatic habitat was limited to barnacles attached to cobble and gravel along the central and south riprap slough, north slope cap, and east-central and west sediment cap areas; sea grass in the west, east-central, and south sediment cap areas; worm tubes in the north and south riprap sloughs; and benthic invertebrates (likely amphipods) in the top few centimeters of the south sediment cap.
- Similar to Year 1, wildlife observations during the Year 2 monitoring included avian and insect activity.

Noted changes between Year 1 and Year 2 conditions were limited to an apparent increase in the area of fine-grained sediment deposition in the north riprap slough and vicinity, and increased vegetation in both pocket beaches. There are two areas where features observed following placement of the cap material in 2012 remain: hummocks in the west sediment cap area near the sheetpile wall, and sandy gravel areas (i.e., heterogeneous, relatively finer areas) in the armored southeast sediment cap (Table 2-2).

Sediment deposition rates vary within Slip 4 (Integral 2006). During Year 1 monitoring, sediment sampling, accumulations of 0–1 cm were observed within the slope cap and northern outfall cap areas, whereas accumulations of 2–8 cm were observed within the southern outfall cap and waterway cap areas. Accumulations were not always uniform, even within small areas, and may reflect periodic disturbances such as prop wash. Similarly, varying thicknesses of fine sediment deposits were observed during the Year 2 visual survey, as noted in the second bullet above.

As noted in the Year 1 monitoring report, variability in local sedimentation rates is comparable to the LDW sediment transport modeling predictions for Slip 4 (AECOM 2012), which predicted lower sedimentation rates within the inner portions of Slip 4 (EAA) and higher sedimentation rates between the EAA and the mouth of Slip 4. In addition, there are a number of potential sources of sediments to Slip 4, as follows:

- **Outfall discharges.** There are six outfalls located within the Slip 4 EAA (Figure 2-1). Each is described below along with an indication of whether the outfall is a potential source of sediment:
  - I-5 Outfall. The I-5 storm drain, owned by the Washington State Department of Transportation, collects runoff from I-5, residential properties, and the north end of the King County Airport (Integral 2006). Given the size of the drainage basin and the lack of stormwater treatment, this outfall is a likely source of sediment to Slip 4.
  - King County Outfall (KC Airport SD #3/PS44 EOF). The King County Airport storm drain, owned by King County, conveys water from North Boeing Field and portions of the King County International Airport. Approximately 64 percent of the stormwater discharged from this outfall was treated by the LTST system during the second year of the LTST system operations (compared with 68 percent during the first year of operation). This outfall may be contributing some sediment to Slip 4. Since about 1985, the outfall has also functioned as an emergency sewer overflow for City pump station 44 (Integral 2006). City records dating back to 2001 indicate that this pump station has not overflowed in the last 13 years and is not considered a source of sediment to Slip 4 (Schmoyer 2014a,b, pers. comm.).
  - NBF Outfall. The NBF storm drain, owned by the City (Leidos 2014) and King County, drains approximately 3 acres on the north end of the King County International Airport (Integral 2006), and is not considered a significant source of sediments to Slip 4. According to City dye testing, there do not appear to be any connections to this outfall. Additional investigation will occur in early 2015 to confirm there are no connections after which the line will be plugged.
  - Georgetown Flume Replacement Outfall. The GTSP storm drain, owned by the City, conveys stormwater from a small portion of the GTSP property and is not considered a significant source of sediments to Slip 4.
  - DeNovo Outfall OF6 and Emerald Services Outfall. Two private storm drains/piped outfalls serving the DeNovo Seattle Inc. LLC (DeNovo) and First South Properties-owned parcels.
- **Sediments from outside the remediation area.** Operations at the DeNovo property (also known as the Crowley site; see Section 3.2.4) include the movement of barges and vessels just outside of the EAA in an area with relatively shallow bathymetry (–15 to −20 feet MLLW). It is likely that prop wash-induced resuspension of sediments is

occurring and may be the most significant source of newly deposited sediments in the EAA. Sediment migration into the slip from the main stem of the LDW is also a likely source of sediment to Slip 4.

- **Boeing Plant 2 dredging.** Boeing Plant 2 perimeter dredging was conducted in the southern (upriver) portion of the Plant 2 DSOA during the Year 2 monitoring time period and is not considered to be a likely source of depositional sediments for Slip 4.
- **Slip 4 EAA sediments.** All sediments, including bank sediments, within the Slip 4 EAA were covered with clean capping material, varying in thickness between 24 and 60 inches, as shown in Figure 1-2. The visual observations noted during the site walk at extreme low tide indicate that the integrity of the cap is intact; thus, the capped Slip 4 EAA sediments are not contributing to the newly deposited sediments within the EAA.

In summary, sediment deposition within Slip 4 is not uniform and sediments are likely being redistributed within Slip 4 and the EAA due to prop wash-induced resuspension, tidal fluctuations, and (to a lesser degree) storm drain outflows.

Based on observations during the visual inspection, the physical integrity of the Slip 4 EAA cap is intact. There were no indications of breaches to the cap integrity or evidence of pollution, and no changes in structural integrity were observed for any of the constructed habitat features within the Slip 4 EAA.

3.2 OTHER INVESTIGATIONS

This section provides a summary of information obtained regarding physical construction or investigations by other parties that occurred in or near the Slip 4 EAA during the Year 2 long-term monitoring period.

3.2.1 NBF RI/FS

The Washington State Department of Ecology (Ecology) has been working on an RI/FS at the NBF/GTSP Model Toxics Control Act site to address additional upland cleanup needs. A work plan was completed in 2013 (Leidos 2013), and fieldwork was scheduled to begin in May 2014. However, this work was put on hold after the potential liable party (PLP) group requested that the RI/FS be transferred back to the PLPs (Edens 2014, pers. comm.).

3.2.2 NBF LTST

During the second year of LTST operation (November 1, 2012, to October 31, 2013), approximately 64 percent of NBF stormwater was treated by the system, down slightly from approximately 68 percent during the first year of operation (Landau 2013, 2014). The remainder bypassed treatment and was discharged directly to Slip 4 (Landau 2014). PCBs and other

hazardous substances in the stormwater continue to be monitored prior to discharge. As in the first year of monitoring, all samples collected at the point of compliance during the second year were below the marine chronic water quality criterion interim goal of 0.030 µg/L for PCBs. Metals, semivolatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs) and BEHP, were also monitored. All concentrations remained below marine chronic water quality criteria except for the limit of quantitation reported for pentachlorophenol (10 µg/L compared to the marine chronic criteria of 7.9 µg/L).

3.2.3 Boeing Plant 2 DSOA Corrective Measure

Boeing is conducting the Plant 2 DSOA Corrective Measure project pursuant to the Administrative Order (Resource Conservation and Recovery Act [RCRA] Docket No 1092-01-22-3008(h)) on Consent issued to Boeing in 1994 by EPA under authority of RCRA Section 3008(h), as amended (42 USC 6928(h)). As reported in the Year 1 monitoring report, the first construction season for dredging of the DSOA began on January 4, 2013, but did not include Slip 4. However, Boeing conducted a pre- and post-construction perimeter sediment monitoring program that included locations in Slip 4. Results for samples collected through March 2013 were reported in the Year 1 monitoring report (Integral 2014).

Boeing reported that it did not perform sediment sampling at Slip 4 during Construction Season 2 (January–March 2014), as this season's work was focused at the south (upriver) end of the DSOA (Gleason 2014, pers. comm.). However, Boeing's construction of new intertidal habitat at the mouth of Slip 4 was completed in late 2013 (Boeing 2014).

Season 3 construction began in fall 2014. Season 3 pre-construction surface sediment sampling in Slip 4 was completed in September 2014 (AMEC 2014). Perimeter surface sampling areas included 3 locations within the City of Seattle-owned portion of the Slip 4 EAA (SD-PER501, SD-PER502, SD-PER503) and 15 locations within Slip 4 between the EAA and the mouth of the slip. Three of the latter locations are within the boundary area just outside of the Slip 4 EAA. Boeing's perimeter sampling locations are shown in Figure D-1 (Appendix D).

Surface sediment samples (top 10 cm) from the perimeter monitoring stations were collected and analyzed for the contaminants of concern identified by EPA for the project (i.e., arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc, and PCBs). TOC was also measured in each sample. Pre-construction perimeter monitoring sample results for construction season 3 are presented in Table 9-5 of Appendix D, along with the results from pre- and post-construction samples from Season 1 (2012–2013) (AMEC 2014). Results of pre-construction monitoring for Season 3 include:

- Metals and PCB concentrations are generally similar to or slightly higher than in the 2013 post-construction samples at most locations. No metals results exceed the SQS in any of the 2014 samples.

- Concentrations of metals and PCBs appear to have increased at the sample locations within the EAA. The 2014 OC-normalized total PCB concentrations are slightly below the 12 mg/kg OC SQS criterion at SD-PER501 and SD-PER 502, but slightly above the criterion at SD-PER503 (12.7 mg/kg OC) near the EAA boundary.
- The 2014 total PCB results from locations in the EAA boundary area (SD-PER504, SD-PER508, and SD-PER509) are slightly higher than in 2013 post-construction samples, but remain below the SQS.
- At the 12 locations between the EAA boundary area and mouth of Slip 4:
  - Total PCB results remain below the SQS at SD-PER506, SD-PER507, SD-PER510, SD-PER512, SD-PER515, and SD-PER517.
  - Total PCB concentrations from locations SD-PER505 and SD-PER518 are slightly lower than the 2013 post-construction samples. Results from both of these locations exceed the SQS in pre- and post-construction samples from construction season 1, but 2014 results from SD-PER518 and one of the field replicates from SD-PER505 do not. The OC-normalized total PCB concentration from the second field duplicate sample from SD-PER505 (Sample SD-PER525-0914) and the average of the two duplicates exceed the SQS.
  - The 2014 total PCB results at Stations SD-PER511, -PER513, -PER514, and -PER516 exceed the SQS. With the exception of SD-PER511, where the highest 2014 PCB concentrations occur, concentrations at these stations did not exceed the SQS in construction season 1.

Post-construction sampling is scheduled for March or April 2015. Post-dredging/pre-backfill cores will also be collected. The final data report (Boeing DSOA Corrective Measure, Dredging Construction Season 3 (September 2014 to March 2015) Completion Report) for these efforts is anticipated to be available in June 2015.

3.2.4 Crowley Site

The Crowley site is undergoing an RI/FS under an Agreed Order (No. DE 6721) with Ecology (SLR 2014a). The site, formerly owned by Crowley Marine Services Inc., was transferred to 8th Avenue Terminals, Inc. in 2008, and was sold to DeNovo in April 2014. The Agreed Order was amended on September 19, 2014, to add DeNovo as a party (Ecology 2014b,c). The first phase of the remedial investigation, a proposed interim action, and a proposed second phase are discussed below.

3.2.4.1 Remedial Investigation—First Phase

The first phase of the remedial investigation consisted of data collection to better understand site contamination, and was conducted from May 2013 through February 2014. The media

sampled were near-surface and subsurface soil, groundwater (including seep water), stormwater, stormwater catch basin solids, and intertidal sediment. Analyses for all media generally included:

- Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc) by EPA Method 200.8
- Mercury by EPA Method 1631E
- SVOCs by EPA Method 8270D
- PAHs by EPA Method 8270D SIM
- PCBs by EPA Method 8082A
- Diesel-range organics and heavy oil by Northwest Method NWTPH-Dx (after silica gel cleanup)
- Gasoline-range organics by Northwest Method NWTPH-Gx
- Volatile organic compounds (VOCs) by EPA Method 8260C.

Soil, catch basin solids, and intertidal sediment were also analyzed for dibenzo-*p*-dioxins and dibenzofurans (dioxins/furans) by EPA Method 8290.

The results from the seep, stormwater, catch basin solids, and intertidal sediment samples as reported by SLR (2014a,b) are presented in tables in Appendix E and are summarized below.

Seeps

During an inspection on July 23 and 24, 2013, 24 groundwater seeps were identified along the sheetpile wall and at the bottom of the boulder riprap within Slip 4. Samples of seep water were collected from five of the locations that had sufficient flow for sampling, one of which (Seep 5) was located within the Slip 4 EAA (Figure E-1, Appendix E). In addition to the above parameters, the seep water samples were analyzed for:

- Total suspended solids by Standard Method 2540D
- Chloride by Method SM4500
- TOC by EPA Method 9060M.

All five seep samples contained total metals concentrations above the site's preliminary groundwater screening and/or preliminary groundwater cleanup levels for arsenic, barium, copper, and selenium (SLR 2014a). The sample from Seep 3 also contained nickel and zinc concentrations above the site preliminary screening and cleanup levels. The seep samples were not analyzed for dissolved metals.

Analytical results for the seep samples as reported by SLR (2014a) are provided in Appendix E.

None of the seep samples contained detected concentrations of PCB Aroclors, petroleum hydrocarbons, or phenols. Seep 4 was the only sample to contain PAHs at concentrations above the site preliminary screening and preliminary cleanup level. BEHP was the only phthalate detected; it was detected in each sample except that from Seep 3 at concentrations below the 1.2 µg/L site preliminary groundwater screening and cleanup levels. BEHP was not detected in the sample from Seep 3, but had a slightly elevated detection limit (1.7 µg/L). The only VOC detected was vinyl chloride in the sample from Seep 4, at a concentration slightly above the 0.13 µg/L site preliminary groundwater screening and cleanup levels.

Stormwater

On July 26, 2013, stormwater grab samples were collected from the six outfalls at the Crowley site, including OF6, which discharges to the EAA (Figure E-1, Appendix E). A second round of stormwater sampling was conducted in February 2014 after the stormwater catch basins on Parcel D were cleaned (SLR 2014b). In addition to the common parameters listed above, the stormwater samples from both rounds of sampling were analyzed for:

- Total suspended solids by Standard Method 2540D
- Chloride by Method SM4500
- TOC by EPA Method 9060M.

The results for these samples are provided in Appendix E. All stormwater samples from both rounds of sampling contained total metals concentrations above the site's preliminary stormwater screening levels for barium and copper (SLR 2014b), and zinc exceeded the site's preliminary screening level in all but the second round sample (and duplicate) from OF2. Arsenic, lead, mercury, and nickel concentrations also exceeded the screening levels in one or more samples. The stormwater samples were not analyzed for dissolved metals. Samples from OF6, which discharges to the EAA, contained barium, copper, lead, and zinc above the site's preliminary stormwater screening levels during both rounds of sampling.

None of the stormwater samples contained detected concentrations of PCB Aroclors or phenols (see Appendix E). No VOC or SVOC constituents were detected above the site preliminary screening levels, with the exception of chloroform in both rounds of samples from OF2. BEHP was the only phthalate detected at concentrations above the preliminary screening levels; this occurred in several samples, including February 2014 samples from OF2, OF3, and OF4. Heavy oil-range petroleum hydrocarbon concentrations were above the site preliminary screening levels in the July 2013 samples from OF2 and OF3 near the mouth of Slip 4; concentrations of all petroleum hydrocarbons were lower than preliminary screening levels in the February 2014 samples.

PAHs were detected in all samples from both rounds of sampling. With the exception of OF2 near the mouth of Slip 4, PAH concentrations generally did not decrease following cleaning of

the Parcel D catch basins. Concentrations of many compounds in the stormwater samples from OF6 were higher in February 2014 than in July 2013, including concentrations of benz[a]anthracene, benzo[b]fluoranthene, and chrysene above site preliminary stormwater screening levels (Appendix E).

Catch Basin Solids

As with stormwater, catch basin solids were sampled for the RI/FS in June 2013 and again in February 2014 following the cleaning of the catch basins on Parcel D (SLR 2014b). The second event was to include the same catch basins sampled during the first event, but upon inspection, only catch basins DP4CB4 and DP6CB4 were found to contain a sufficient volume of solids for sampling. These two catch basins were sampled in February 2014. DP6CB4 is part of the DP6 storm drain system that discharges at OF6 in the Slip 4 EAA. The results of both rounds of sampling are included in the (SLR 2014b) tables provided in Appendix E.

Concentrations of several metals exceeded the site's preliminary catch basin solids screening levels in one or more samples from both rounds of sampling. Concentrations of cadmium, copper, lead, mercury, and zinc also exceeded the SQS criteria in one or more samples from June 2013, and zinc continued to exceed SQS criteria in both samples from February 2014.

PCB Aroclors were detected only in the second round of sampling (Appendix E). Detected dry weight concentrations of total PCB Aroclors were an estimated 0.11 mg/kg in DP4CB4 and an estimated 0.2 mg/kg in DP6CB4 (where nondetected Aroclors were assigned values of zero). These detected concentrations are lower than the *U*-qualified concentrations (i.e., not detected at or above the practical quantitation limit) reported from first round of sampling. Based on unvalidated laboratory results provided by SLR (2014a,b; Appendix E), TOC concentrations in the 2013 and 2014 catch basin samples ranged from 4.76 percent to 33.8 percent, above the 4 percent TOC content considered appropriate in the LDW for OC-normalization and comparison to the 12 ppm OC-normalized SMS criterion (Windward 2010). The total PCB concentration in DP6CB4 (0.30 mg/kg) is higher than the 0.13 mg/kg lowest apparent effects threshold (LAET) value (PSEP 1988).

Detected and/or *U*-qualified concentrations of several SVOCs, PAHs, phthalates, phenols, and two VOC compounds exceeded the site preliminary catch basin solids screening levels—many of which are equivalent to LAET values—and SMS dry weight criteria in both rounds of sampling. Total xylenes in DP4CB4 was the only VOC to exceed the preliminary screening level in the second round of sampling; however, this concentration (0.01 mg/kg) was reported as estimated by the analytical laboratory because the internal standard was outside of control limits (SLR 2014b).

Total petroleum hydrocarbons (sum of gasoline-, diesel-, and heavy oil-range hydrocarbon concentrations reported by SLR [2014b]) were detected at concentrations up to 27,000 mg/kg (in DP4CB4) in the June 2013 samples and up to 29,000 mg/kg (also in DP4CB4) in the February

2014 samples. There are no site preliminary catch basin solids screening levels for hydrocarbons (SLR 2014b).

Dioxin/furan concentrations exceeded the 2.20 x 10^{-6} mg/kg site preliminary catch basin solids screening level based on 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) toxicity equivalent (TEQ) concentration in both DP4CB4 and DP6CB1 sampled for these compounds in June 2013. This was true both when *U*-qualified values were summed as zero and also when they were summed as one-half the method reporting limit. Only the sample from DP4CB4 collected in February 2014 was analyzed for dioxins/furans. Concentrations in this sample did not exceed the site preliminary catch basin solids screening level (Appendix E).

Intertidal Sediment

On July 23 and 24, 2013, five intertidal sediment samples were collected, one near each end of the Crowley site pier, and near outfalls OF2, OF3, and OF4 within Slip 4. The locations of the intertidal sediment samples are indicated on Figure E-1 (Appendix E). None of the intertidal sediment samples were collected from locations within the Slip 4 EAA; however, IS-5 was located within the boundary area immediately adjacent to the Slip 4 EAA. The sediment samples were analyzed for the common parameters listed above, with the exception of volatile analytes (VOCs and gasoline-range hydrocarbons). In addition, the sediment samples were analyzed for grain size by ASTM D-422 and TOC by EPA Method 9060. Analytical results for the intertidal sediment samples as reported by SLR (2014a) are provided in Appendix E.

Metals concentrations above the site preliminary sediment screening levels included antimony, arsenic, chromium, and lead; however, none of the concentrations exceeded SQS criteria.

The dry weight concentrations of total PCB Aroclors ranged from an estimated 0.22 mg/kg to 0.9 mg/kg (where nondetected Aroclors were assigned values of zero), exceeding the site preliminary sediment screening level in four of the five samples. The maximum value of 0.9 mg/kg was flagged by the laboratory as an estimate because it exceeded the calibration range (SLR 2014a). The unvalidated TOC results provided in the laboratory data appendix of SLR (2014a) indicate that the TOC content of the intertidal sediment samples ranged from 2.15 to 3.62 percent (Appendix E). Data obtained from this sampling effort may be used for comparison purposes for future monitoring events. For this purpose, Integral normalized the PCB results from the intertidal sediment samples for comparison to the 12 mg/kg OC-normalized SQS criterion. The OC-normalized results are presented in Table 3-1. As shown, the concentrations in the three samples collected from within Slip 4 exceed the SQS criterion, including IS-5 in the boundary area.

Several detected PAH compounds, BEHP, and butyl benzyl phthalate also exceeded the site preliminary screening levels, as did *U*-qualified results for several SVOCs, phenols, and butyl benzyl phthalate. *U*-qualified concentrations of 2,4-dimethylphenol, 2-methylphenol, the coeluted 3- and 4-methylphenol, and benzoic acid exceeded the dry weight SQS criteria in the

IS-4 sample, as did the *U*-qualified concentrations of benzyl alcohol in several samples (Appendix E).

Combined diesel- and heavy oil-range hydrocarbon concentrations ranged from 268 mg/kg up to 6,840 mg/kg in the intertidal sediment samples. There are no site preliminary sediment screening levels for hydrocarbons (SLR 2014b).

Dioxin/furan concentrations exceed the 2.20×10^{-6} site preliminary sediment 2,3,7,8-TCDD TEQ screening level at all five locations, both when *U*-qualified values are summed as zero and when they are summed at one-half the method reporting limit (Appendix E).

3.2.4.2 Interim Action

In July 2014, Anchor QEA submitted an interim action work plan to Ecology on behalf of DeNovo to support an upcoming rail improvements and maintenance project. The rail improvements project, being implemented by DeNovo and Waste Management National Services, will extend rail access and service to the property from the existing East Marginal Way Union Pacific Railroad main line so that the property may operate as a sediment offloading facility to support planned LDW sediment remediation projects (Anchor QEA 2014a,b). The proposed interim action will include the excavation and offsite disposal of soil within the area of the planned rail line and concrete slab (and up to approximately 16 feet below ground surface) that contains contaminant concentrations above the interim action cleanup levels (Anchor QEA 2014b). The interim action work plan underwent a public comment period through September 2 (Thomas 2014, pers. comm.). During the State Environmental Policy Act (SEPA) public comment period, the Washington State Department of Archaeology and Historic Preservation (DAHP) identified the project as having a very high potential for archaeological resources (Ecology 2014a). As a result, Ecology withdrew its Determination of Non-Significance (DNS), and the interim action has been cancelled (Ecology 2014a; Sutton 2014, pers. comm.).

3.2.4.3 Remedial Investigation—Second Phase

In June 2014, DeNovo issued a draft sampling and analysis plan (SAP) addendum (SLR 2014b) for a second phase of RI/FS sampling and surveys. The draft SAP addendum calls for the installation of additional monitoring wells; the collection of additional soil, groundwater, and stormwater samples; and the collection of surface sediment samples in Slip 4 and the LDW offshore of the facility pier to establish baseline sediment conditions prior to the start of planned sediment offloading operations (SLR 2014c). The SAP also includes a geophysical survey to determine the depth of the sheetpile wall in the southwestern portion of Parcel D (Figure E-1, Appendix E), and a tidal study to assess site groundwater interactions with the LDW.

DeNovo submitted a revised draft SAP Addendum to Ecology on November 7, 2014 (Sutton 2014, pers. comm.). Sampling began on November 24, prior to Ecology approval of the work

plan; additional sampling may be needed pending Ecology's final SAP Addendum review (Sutton 2014, pers. comm.).

3.3 ASSESSMENT OF LONG-TERM MONITORING OBJECTIVES

As stated in Section 1.1, the long-term objective of the sediment removal action for the Slip 4 EAA is to reduce the concentration of contaminants in post-cleanup surface sediments (0−10 cm) to below the SQS for PCBs and other chemicals of interest, thereby reducing risks to human health and the environment resulting from potential exposure to contaminants in sediments in the Slip 4 EAA (USEPA 2006). Specific study questions that address the monitoring program objectives are discussed in this section with respect to the Year 2 monitoring results:

- **Are contaminant concentrations in Slip 4 EAA surface sediments (0–10 cm) below the SQS?** No sediment samples were collected by the City within the Slip 4 EAA during the 2014 monitoring period. Samples collected in the EAA by Boeing in September 2014 (Figure D-1) show total PCB concentrations below the SQS at two locations, and slightly above the SQS at one location near the EAA boundary. In the EAA boundary area, total PCB concentrations in three samples collected by Boeing are below SQS criterion, and one intertidal sediment sample collected as part of the Crowley site RI/FS exceeds it.

- **Is the physical integrity of the cap in the Slip 4 EAA being maintained such that the sediment cap continues to isolate contaminants in underlying sediments from marine biota?** Visual inspection results (Sections 2.2 and 3.1) indicate that the Slip 4 EAA sediment and slope caps are fully functional, in good condition, and continue to isolate contaminants in underlying sediments from marine biota. As discussed in Section 3.1, the layer of fine sediments overlying the waterway and outfall cap areas are a result of depositional sediments, not a result of cap failure.

- **Do the institutional controls associated with the Slip 4 EAA remedy remain in place and continue to work effectively?** All institutional controls have been implemented as of November 20, 2014, and no evidence has been observed that they are not meeting their stated objectives.

- **Are physical changes occurring related to sediment erosion and sediment deposition in the Slip 4 EAA?** As discussed in Section 3.1, minor physical changes have occurred in the Slip 4 EAA within the 2 years post-remedy as a result of sediment deposition. Observed deposits of sediments overlying the cap material varied between 0 and 18-cm thick. Prop wash-induced resuspension of sediments from outside the Slip 4 EAA is the most likely source of depositional sediment within the Slip 4 EAA. Storm drain outflows to the EAA are also (to a lesser degree) a potential source of depositional

sediment. Possible evidence of material redistribution noted during the visual survey has been observed in site photos that date back to baseline conditions.

3.4 CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE MONITORING

The objectives of the Year 2 monitoring program for the Slip 4 EAA were achieved. The investigation findings indicate that the sediment cap and backfill remain structurally stable and intact, and sediment continues to accumulate on top of the cap. Although Ecology determined that source control within the Slip 4 drainage basin was sufficient to allow the Slip 4 remedy to be implemented (Ecology 2011), source control efforts in the Slip 4 basin and overall LDW basin continue. As new sediment deposits on the clean cap surface, contaminants associated with the sediment particles will accumulate and be measured in the long-term monitoring program. As observed in the Year 1 monitoring, concentrations of this deposited material have generally remained below the SQS with only minor exceptions. Continued monitoring will document both the long-term success of the remedial action as well as track conditions associated with new sediments that deposit within the EAA. Conditions observed during Year 2 (2014) monitoring were similar to those found in Year 1. Overall, fine sediment deposits observed were generally on the order of 1 mm across most of the exposed intertidal slope cap, but areas of accumulations of 1 cm or more were observed in the sediment cap areas. The thickest accumulations (up to 18 cm) were generally observed in the armored outfall slough. The area of fines deposition near the northwestern corner of the head of the slip near the north riprap slough appeared to be slightly larger than in 2013.

No modifications to the long-term monitoring plan are recommended based on the Year 2 monitoring. The long-term monitoring plan includes sediment sampling within the Slip 4 EAA during Year 3 (2015), and the following modification is recommended based on Year 1 monitoring:

- Given that the slope cap sample composites for both the post-remedy confirmation sampling and the Year 1 long-term monitoring sampling required an adjustment from +2 to +4 feet MLLW, it is recommended that future monitoring of the slope cap automatically defer to the +4 feet MLLW elevation.

4 REFERENCES

AECOM. 2012. Lower Duwamish Waterway Final Feasibility Study. Prepared for the Lower Duwamish Waterway Group for submittal to U.S. Environmental Protection Agency, Region 10, Seattle, WA, and the Washington State Department of Ecology, Northwest Regional Office, Bellevue, WA. AECOM, Seattle, WA. October 31.

AMEC. 2014. Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project, Boeing Plant 2: 2012-2013 Construction Season Completion Report. Prepared for The Boeing Company, Seattle, WA. AMEC Environment & Infrastructure, Inc., Lynnwood, WA.

AMEC. 2013. Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project, Boeing Plant 2: 2012-2013 Construction Season Completion Report. Prepared for The Boeing Company, Seattle, WA. AMEC Environment & Infrastructure, Inc., Lynnwood, WA. October 1.

Anchor QEA. 2014a. Draft Interim Action Work Plan, Crowley Marine Services 8th Avenue South Site, Seattle, Washington. Prepared for Washington State Department of Ecology on Behalf of DeNovo Seattle, LLC, Chicago, IL. Anchor QEA, LLC, Seattle, WA. July 2014.

Anchor QEA. 2014b. Remediation Plan for the Rail Improvements Project, 7400 8th Avenue South Property, Seattle, Washington. Memorandum to Washington Department of Ecology. Anchor QEA, Seattle, WA.

Boeing. 2014. Plant 2 Habitat Restoration and Sediment Cleanup, Lower Duwamish Waterway, Seattle, Washington. http://www.boeing.com/assets/pdf/aboutus/environment/duwamish/docs/duwamish_background.pdf. Accessed September 4, 2014.

Crowley, A. 2014. Personal communication (e-mail to K. Keeley, U.S. Environmental Protection Agency dated April 9, 2014 regarding ASAOC No. CERCLA #10-2006-0364 - Slip 4 Title Commitment. Seattle City Light, Seattle, WA.

Ecology. 2011. Lower Duwamish Waterway Slip 4 Interim Source Control Status Report. Washington State Department of Ecology, Bellevue, WA. March 9.

Ecology. 2014a. Crowley Marine Services 8th Ave. South, SEPA Determination of Non-Significance Withdrawn and Interim Action Suspended. Toxics Cleanup Program, Washington State Department of Ecology, Bellevue, WA. October.

Ecology. 2014b. Letter of Amendment, Agreed Order No DE 6721. Washington State Department of Ecology, Bellevue, WA. September 19.

Ecology. 2014c. Crowley Marine Services Inc. 8th Ave S. https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=2520. Accessed August 8, 2014. Washington State Department of Ecology.

Edens, M. 2014. Personal communication (email to S. FitzGerald, Integral Consulting Inc. dated July 31, 2014, regarding the status of the NBF/GTSP RI/FS. Washington State Department of Ecology, Bellevue, WA.

Gleason, M. 2014. Personal communication (e-mail to R. Carscadden, Integral Consulting Inc., Seattle, WA, dated August 7, 2014, regarding Boeing Plant 2 dredge monitoring data). Boeing Enterprise Remediation, Seattle, WA.

Hinson, M. 2014. Personal communication (e-mail to S. Ashurst, Integral Consulting Inc., Seattle, WA, dated September 16, 2014, regarding rain gauge output table obtained from K. Peck). Seattle Public Utilities, Seattle, WA.

Integral. 2006. Lower Duwamish Waterway Slip 4 Early Action Area: Engineering Evaluation/Cost Analysis. Prepared for City of Seattle and King County, Seattle, WA. Integral Consulting Inc. February 10.

Integral. 2010. Lower Duwamish Waterway Slip 4 Early Action Area: 100% Design Submittal, Design Analysis Report. Prepared for City of Seattle and King County. Integral Consulting Inc., Seattle, WA.

Integral. 2011. Georgetown Steam Plant – Interim Action Work Plan. Prepared for Seattle City Light, Seattle, WA. Integral Consulting Inc., Seattle, WA. June 2.

Integral. 2012. Lower Duwamish Waterway Slip 4 Early Action Area: Removal Action Completion Report. Prepared for City of Seattle. Integral Consulting Inc., Seattle, WA. July 26.

Integral. 2013a. Lower Duwamish Waterway Slip 4 Early Action Area: Long-Term Monitoring and Reporting Plan. Prepared for City of Seattle. Integral Consulting Inc., Seattle, WA. March 21.

Integral. 2013b. Lower Duwamish Waterway Slip 4 Early Action Area: Institutional Controls Implementation Report. Prepared for City of Seattle. Integral Consulting Inc., Seattle, WA. November 27.

Integral. 2014. Lower Duwamish Waterway Slip 4 Early Action Area: Long-Term Monitoring Data Report Year 1 (2013). Prepared for the City of Seattle. Integral Consulting Inc., Seattle, WA. January 27.

Landau. 2013. Annual Performance Evaluation Report, Long-term Stormwater Treatment 2011-2012, North Boeing Field, Seattle, Washington. Prepared by Landau Associates, Edmonds, WA. March 28.

Landau. 2014. Annual Performance Evaluation Report, Long-term Stormwater Treatment - 2012-2013, North Boeing Field, Seattle, Washington. Prepared by Landau Associates, Edmonds, WA. March 7.

Leidos. 2014. Lower Duwamish Waterway Outfall Inventory Update, January 2012- February 2014. Prepared for Washington Department of Ecology, Bellevue, WA. Leidos (formerly SAIC), Bothell, WA. March.

Leidos. 2013. North Boeing Field/Georgetown Steam Plant Site Remedial Investigation/ Feasibility Study Work Plan. Prepared for Washington Department of Ecology, Bellevue, WA. Leidos (formerly SAIC), Bothell, WA. November 11.

NOAA. 2014. Tides and Currents. Available at: http://tidesandcurrents.noaa.gov/noaatidepredictions/viewMonthlyPredictions.jsp?bmon=07&bday=01&byear=2013&timelength=monthly&timeZone=2&dataUnits=1&datum=MLLW&timeUnits=2&interval=highlow&format=Submit&Stationid=9447029. National Oceanic and Atmospheric Administration, Center for Operational Oceanographic Products and Services, Silver Spring, MD.

Peck, K. 2014. Personal communication (email to S. Wodzicki, Integral Consulting Inc., dated August 5, 2014, regarding rain gauge data request). Seattle Public Utilities, Seattle, WA.

PSEP. 1988. Sediment Quality Values Refinement: Volume 1, 1988 Update and Evaluation of Puget Sound AET. Prepared for U.S. Environmental Protection Agency Region 10 – Office of Puget Sound, Seattle, WA. Puget Sound Estuary Program. September.

Schmoyer, B. 2014a. Personal communication (phone conversation with K. Magruder Carlton, Integral Consulting Inc., Seattle, WA, regarding King County Airport storm drain overflow records). Seattle Public Utilities, Seattle, WA.

Schmoyer, B. 2014b. Personal communication (email to S. FitzGerald, Integral Consulting Inc., Seattle, WA, regarding King County Airport storm drain discharges). Seattle Public Utilities, Seattle, WA. August 19.

SCL. 2014a. Technical memorandum to K. Keeley, U.S. Environmental Protection Agency from A. Crowley, dated January 14, 2014, regarding Lower Duwamish Waterway Superfund Site, Slip 4 Early Action Area, Institutional Controls Implementation Report. Addendum 1: The Boeing Company Environmental Covenant. Seattle City Light, Seattle, WA.

SCL. 2014b. Technical memorandum to K. Keeley, U.S. Environmental Protection Agency from A. Crowley, dated March 14, 2014, regarding Lower Duwamish Waterway Superfund Site, Slip 4 Early Action Area, Institutional Controls Implementation Report. Addendum 2: First South Properties, LLC Lot Line Adjustment. Seattle City Light, Seattle, WA.

SCL. 2014c. Technical memorandum to K. Keeley, U.S. Environmental Protection Agency from A. Crowley, dated November 20, 2014, regarding Lower Duwamish Waterway Superfund Site, Slip 4 Early Action Area, Institutional Controls Implementation Report. Addendum 3: Slip 4 Regulated Navigation Area Final Rule Federal Register Publication. Seattle City Light, Seattle, WA.

SLR. 2014a. Draft Data Gaps Report, First Phase of Remedial Investigation, 8th Avenue Terminals, Inc. Site, Seattle, Washington. Prepared for 8th Avenue Terminals, Inc. SLR International Corporation, Bothell, WA. February 14.

SLR. 2014b. Results of Second Catch Basin Solids and Storm Water Sampling Events, First Phase of Remedial Investigation, 8th Avenue Terminals, Inc. Site, Seattle, Washington. Letter report submitted to V. Sutton, WA Department of Ecology, Bellevue, WA. SLR International Corporation, Bothell, WA. April 11.

SLR. 2014c. 8th Avenue Terminals, Inc. Site, Draft Sampling and Analysis Plan Addendum. Prepared for DeNovo Seattle, LLC, Chicago, IL. SLR International Corporation, Bothell, WA. June.

Sutton, V. 2014. Personal communication (email to S. FitzGerald, Integral Consulting Inc., Seattle, WA, regarding updated status information for Phase 2 RI/FS sampling at Crowley Marine Services 8th Avenue South Site). Washington State Department of Ecology, Bellevue, WA. December 10.

Thomas, R. 2014. Personal communication (phone conversation with S. FitzGerald, Integral Consulting Inc., Seattle, WA, regarding status of Interim Action at Crowley Marine Services 8th Avenue South Site). Washington State Department of Ecology, Bellevue, WA. August 8.

USEPA. 2006. Action Memorandum for a Non-Time-Critical Removal Action at the Slip 4 Early Action Area of the Lower Duwamish Waterway Superfund Site, Seattle, Washington. U.S. Environmental Protection Agency, Region 10, Seattle, WA. May 3.

Windward. 2010. Lower Duwamish Waterway Remedial Investigation, Remedial Investigation Report. Final. Prepared for Lower Duwamish Waterway Group for submittal to U.S. Environmental Protection Agency, Seattle, WA, and Washington State Department of Ecology, Bellevue, WA. Windward Environmental, LLC. July 2010.

FIGURES

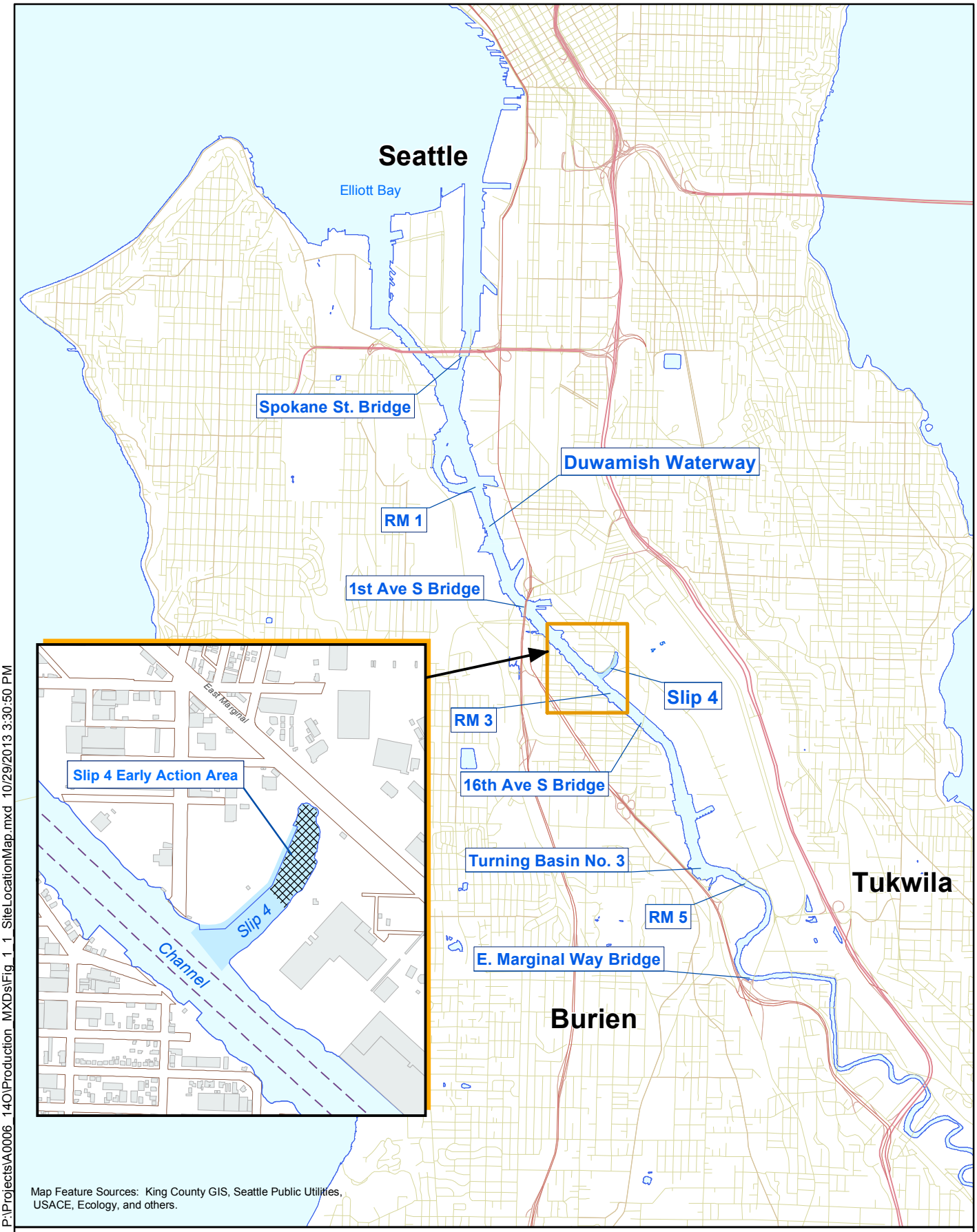

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Figure 1-1.
Vicinity Map
Slip 4 Early Action Area
Long-Term Monitoring Data Report - Year 2 (2014)

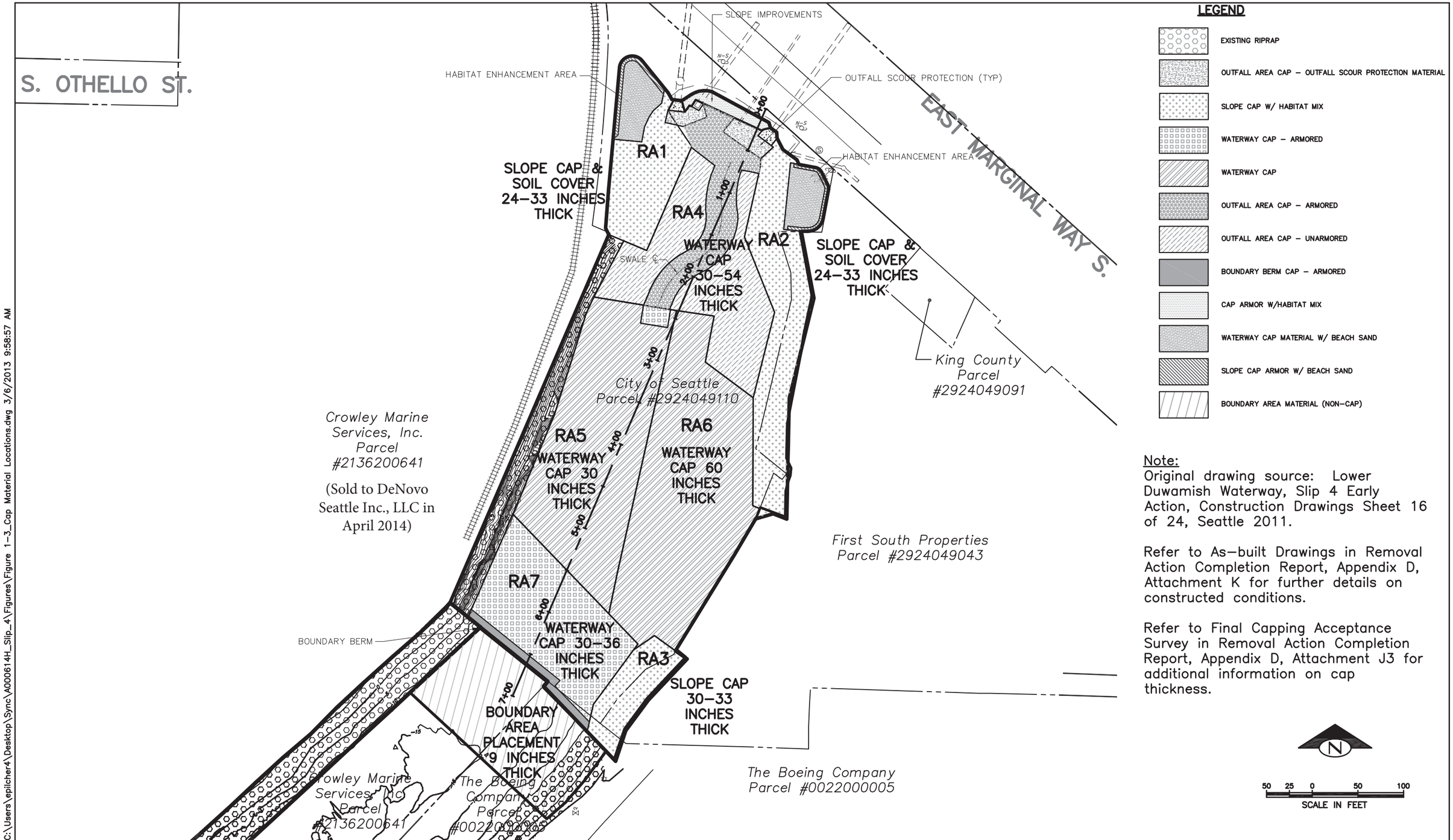

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Figure 1-2.
Sediment Cap and Soil Cover Design
Slip 4 Early Action Area
Long-Term Monitoring Data Report - Year 2 (2014)

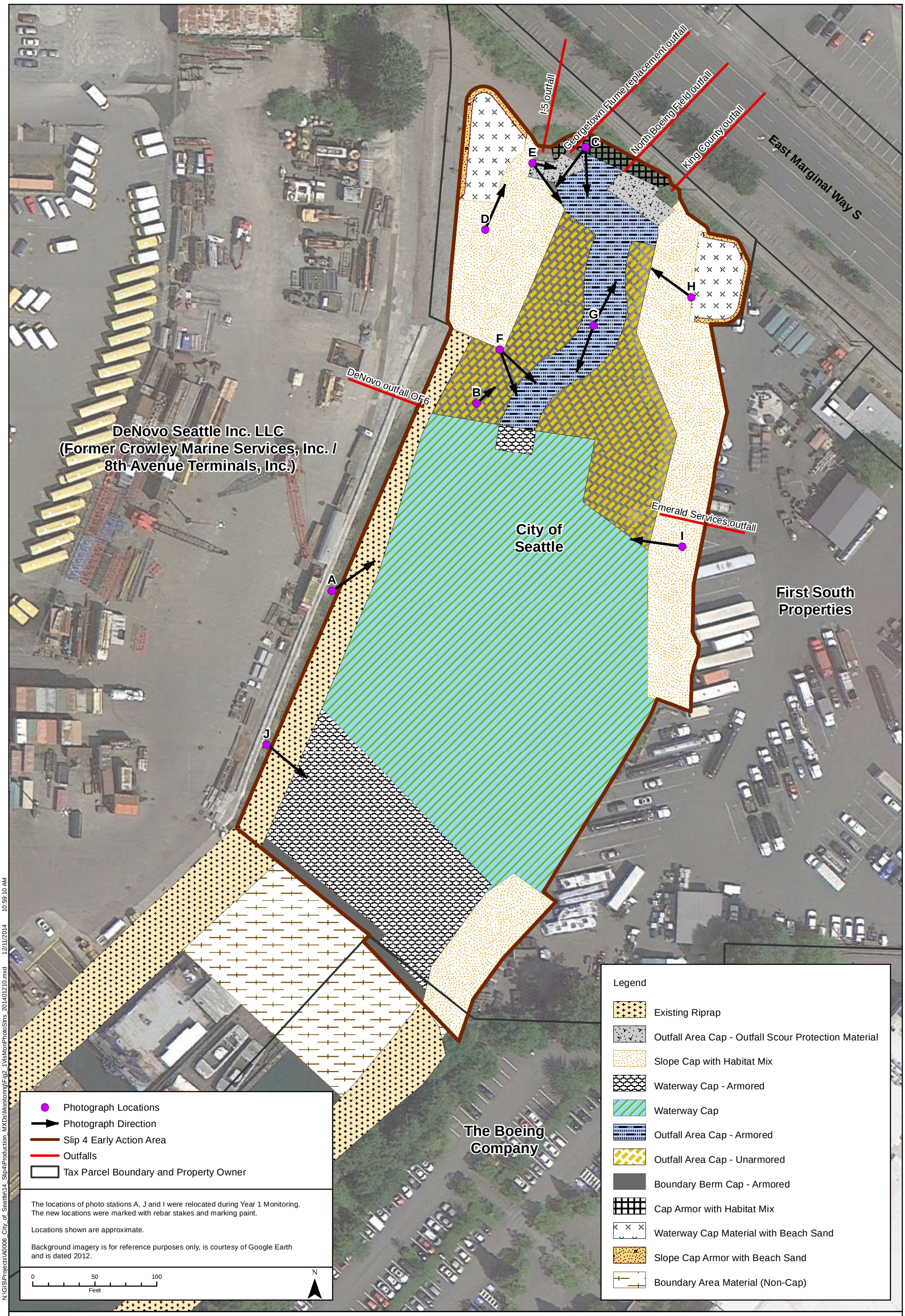

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Figure 2-1.
Visual Monitoring Photo Station Locations
Slip 4 Early Action Area
Long-Term Monitoring Data Report - Year 2 (2014)

TABLES

Table 1-1. Long-Term Monitoring Study Questions and Informational Inputs

Study Questions	Informational Inputs
Are contaminant concentrations in Slip 4 EAA surface sediments (0–10 cm) below the SQS?	• Chemical analysis of surface sediment samples from capped areas (bank and channel) • Chemical analysis of surface sediment samples from boundary material placement area
Is the physical integrity of the cap in the Slip 4 EAA being maintained such that the sediment cap continues to isolate contaminants in underlying sediments from marine biota?	• Visual inspections and photo-documentation of cap conditions at low tide • Hydrographic surveys • Topographic surveys (if required)
Do the institutional controls associated with the Slip 4 EAA remedy remain in place and continue to work effectively?	• Review status of institutional controls • Review violations and/or any notifications for variances from institutional controls • Review available information associated with any activity controlled by an institutional control
Are physical changes occurring related to sediment erosion and sediment deposition in the Slip 4 EAA?	• Visual inspections and photo-documentation of cap conditions at low tide • Hydrographic surveys • Topographic surveys (if required) • Visual observations and photo-documentation of surface sediment samples collected during long-term monitoring • Documentation of 100-year storm flow events within the monitoring period

Notes:

EAA = early action area

SQS = Washington State Sediment Quality Standards

Table 1-2. Long-Term Monitoring Schedule

	Year to be Performed									
Monitoring Activities	1 2013	2 2014	3 2015	4 2016	5 2017	6 2018	7 2019	8 2020	9 2021	10 2022[a]
Visual Inspections[b]	X	X	X	X	X		X			X
Institutional Control Update	X	X	X	X	X		X			X
Review of Physical Construction/Investigations by Others	X	X	X	X	X		X			X
Review of Storm Flow Monitoring Data for 100-Year Events	X	X	X	X	X		X			X
Hydrographic Surveys[c,d]					X					X
Topographic Surveys[e]										
Sediment Sampling[d]										
Composite Slope Cap Samples (2)[f]	X		X		X		X			X
Discrete Waterway Cap Samples (6)[f]	X		X		X		X			X
Discrete Boundary Area Documentation Samples (2)[g]	X									

Notes:

EPA = U.S. Environmental Protection Agency

PCB = polychlorinated biphenyl

QAPP = quality assurance project plan

[a] Subsequent monitoring after Year 10 will be determined upon consultation with EPA.

[b] Additional visual inspections will be performed after any significant seismic events (peak horizontal ground acceleration greater than 0.10 *g*).

[c] Multi-beam echo sounding at intervals not exceeding 20 feet, utilizing similar equipment and methods used for the removal action post-construction survey.

[d] Frequency may increase if warranted based on visual inspection.

[e] As needed based on visual inspection reports of significant physical disturbances observed (e.g., bank slope deformation) or after significant seismic events.

[f] 0–10 cm horizon. To be analyzed for all target analytes listed on Table A-1 of the QAPP (Appendix A).

[g] 0–10 cm horizon. To be analyzed for PCB Aroclors, total organic carbon, and total solids.

Table 2-1. Photo Log for 2014 Slip 4 EAA Visual Monitoring

Photo Station ID	Target Coordinates				Marker Type/Condition	Target Photo Orientation (Degrees True North)	Actual Photo Orientation (Degrees Magnetic North) [b]	Photo ID	Photo Numbers	Photo Time	Photo Target Area Description
	Latitude	Longitude	Northing [a]	Easting [a]							
A	47.536176	-122.319524	199125[c]	1273323[c]	Good	55	39 M	A1	0119, 0120	1157	East-Central Sediment Cap
B	47.536635	-122.319241	199292	1273396	Good	48	22[d] M	B1	0121, 0123	1203	North Sediment Cap
C	47.537207	-122.318901	199499	1273484	Good	178	162 M	C1	0098, 0099	1108	Northwest Slope Cap, South Sediment Cap
						217	201 M	C2	0100 - 0102	1110	Northwest Slope Cap
D	47.537020	-122.319224	199432	1273403	Good	24	8 M	D1	0092, 0093	1054	Northwest Beach/Anchored Logs
E	47.537169	-122.319075	199486	1273441	Good, but tilted on arrival; marker was straightened by field crew.	102	86 M	E1	0094, 0095	1101	North Slope Cap, Outfalls
						144	128 M	E2	0096, 0097	1104	Northeast Slope Cap, North Rip Rap Slough
F	47.536756	-122.319169	199335	1273415	Marker on its side but in same apparent location	133	117 M	F1	0124, 0125	1210	East Slope Cap, East Sediment Cap, Central Rip Rap Slough
						160	144 M	F2	0126, 0127	1213	Southeast Slope and Sediment Cap
G	47.536813	-122.318864	199355	1273491	Good	200	184 M	G1	0113, 0114	1128	South Rip Rap Slough
						27	11 M	G2	0115, 0116	1130	North Rip Rap Slough, Sediment Cap, North Slope Cap
						0-360	0-360 M	G3	0103 - 0112[e]	1126	Entire Slip 4 EAA
H	47.536879	-122.318546	199378	1273570	Good	306	290 M	H1	0128, 0129	1240	Northwest Slope Cap, Beach Cap, Sediment Cap
I	47.536322	-122.318486	199174[c]	1273581[c]	Good	278	262 M	I1	0132, 0133	1248	West Sediment Cap
J	47.535834	-122.319738	199002[c]	1273268[c]	Good	130	114 M	J1	0117, 0118	1152	Southeast Slope Cap

Notes:
[a] Washington state plane coordinate system, north zone (NAD-83/91), U.S. feet.
[b] Actual azimuth values are approximate, based on compass readings (referencing magnetic north) in the field. Magnetic North declination from True North for Seattle in July 2014 is 16.16 degrees (NOAA 2014: http://www.ngdc.noaa.gov/geomag-web/#declination), therefore magnetic north (compass) azimuth values are approximately 16 degrees from true north azimuth values.
[c] These coordinates are approximate.
[d] Due to a mathematical error in the field, the actual azimuth orientation is 10 degrees off from the target.
[e] The 10 individual photos make up the 360° view of the Slip 4 EAA.

Table 2-2. Visual Inspection Summary

Area Observed	Date	Time	Area Substrate Classification	Estimated Thickness of Fines	Stratification	Color	Evidence of Pollution	Organic Matter	Evidence of Debris/Litter/Garbage	Assessment of the Re-establishment of Intertidal Aquatic Habitat	Wildlife Use Observations	Observations of Cap Disturbance / Erosion / Changed Condition	Assessment of Cap Integrity	Notes
Central Riprap Slough	7/12/2014	1114	Cobble, fines	1-18 cm observed	Fines on top of cobble	Brown surface, black below	None observed	Wood debris, leaf litter	Beverage lid	Barnacles	Birds, droppings	None observed	Good	Heterogeneous surface in this area.
East Sediment Cap	7/12/2014	0929	Cobble, gravel, organic matter, woody detritus	Trace (1 mm or less)	Similar to Southeast Sediment Cap	Brown	None observed	Trace leaf litter, algae, few shell fragments and wood debris	Plastic bottle	None observed	Birds foraging	None observed	Good	--
East Slope Cap	7/12/2014	0924	Cobble, gravel	Algae growing on surface below high tide line	None	Gray	None observed	Woody detritus and leaf litter at high tide line	Minor plastic trash, plastic bottles, plastic cup, PVC pipe ~6-8 inches in length	None observed	None observed	None	Good	Supplemental photo #0091 shows brown surface over black organic deposit (~5 mm thick) on top of gravel, H2S odor, possibly at boundary of unarmored area and scattered areas.
East-Central Sediment Cap	7/12/2014	1218	Cobble, gravel, sand, silt	0 to 2 cm observed	2 cm of gravel over sandy gravel, with areas of fines deposits	Gravel is brown. Fines have brown surface, black below.	None observed	Trace small twigs	None observed	Barnacles, green sea grass (less dense than on west sediment cap).	Birds	No observed change	Good	Areas of fine deposits appear to have occurred since 2012 (cap placement).
North Riprap Slough	7/12/2014	1011	Riprap, gravel, sand, fines	Up to 2 cm fines observed	Riprap extends 15 ft from outfall; silty sand in slough with patches of fine surface deposits with sand below; alternating layers of sands and fines.	Brown surface, black below	None observed	Leaf and woody debris	Nylon web strap, cup, piece of plastic (~3 inches), plastic bottle	Worm tubes	Birds	Possibly larger area of fines deposits	Good	Heterogeneous surface in this area.
North Sediment Cap	7/12/2014	0954	Gravel, clayey gravel	Trace (1 mm or less)	2 cm of gravel over clayey gravel	Brown on surface, dark gray below	None observed	Woody detritus, algae	None observed	None observed	Birds	None observed	Good	--
North Slope Cap	7/12/2014	1000	Boulders, cobble, silt/clay, organic matter	1-2 mm of sediment and organics (algae) on surface of boulders	1.5 cm of organic clayey deposits over gravel, some areas with no cobble	Brown on surface, black below	None observed	Woody detritus, sticks, algae below high tide line	Trace plastic litter	Barnacles on underside of boulders	Birds	None observed	Good	--
North Slope Cap at Outfalls	7/12/2014	1007	Cobble, gravel, sand	--	Sandy gravel in between gravel at mouth of outfall.	Brown	None observed	Woody debris, increased leaf litter over the general area immediately in front of outfall	Glass bottle, plastic debris near mouth of outfall	None	None observed	None observed	Good	--
Northeast Slope Cap	7/12/2014	0946	Cobble, gravel, sand	Trace (1 mm or less)	4 cm gravel over brown sandy gravel	Gray and brown	None observed	Algae below high tide line, trace leaf litter and woody detrirus at high tide line	Paper debris above high tide line	None	Bird droppings	None observed	Good	--
Northwest Beach/Anchored Logs	7/12/2014	1043	Sand (medium/fine)	None	None observed	Gray	None observed	Scattered woody debris, logs, plants	Styrofoam cup, plastic bottle, chip bag	None observed	Birds, feathers, bird droppings	Increased shrub growth	Good	Logs in good condition.
Northwest Sediment Cap	7/12/2014	1030	Gravel	Trace to 2.5 cm	Brown surface, black below. Fines on top of gravels in limited areas.	Brown surface, black below	None observed	Woody debris scattered	Small plastic ribbon	None observed	Birds	None observed	Good	--
Northwest Slope Cap	7/12/2014	1022	Cobble, gravel, sandy gravel, limited areas of fines	1 cm or less in limited areas	2 cm gravel over sandy gravel	Gray and brown	None observed	Woody detritus, algae below high tide line	None observed	None observed	Birds	None overall, but gravel deposit is thinner in northwest corner, possibly associated with water drainage. Also areas of thin fine deposits in lower slope since 2012.	Good	--
South Riprap Slough	7/12/2014	1132	Cobble, gravel, silt	0-5 cm observed	Fines on top of cobble	Brown surface, black below	None observed	Woody debris, branches, sticks	Plastic debris	Barnacles, worm tubes	Birds	Increased fine deposition in lower areas	Good	--
South Sediment Cap	7/12/2014	1207	Gravel, sandy gravel, areas of fines	Trace, but small areas up to 2.5 cm	2 cm of gravel over sandy gravel	Brown on surface, dark gray below	None observed	Trace woody debris (small sticks)	None observed	Small patch of bright green sea grass, benthic aquatic invertebrate in sediment	Birds	None observed	Good	--
Southeast Sediment Cap	7/12/2014	0915	Gravel (rounded), sand	1-2 mm in some locations of fines deposition	Algae on gravel with some areas of sandy gravel	Brown	None observed	Minor leaf litter and small woody debris, algae	Plastic bag, strawberry	No evidence	Flies, bird feather	None observed. Sandy gravel areas noted on field forms have been present since 2012.	Good	--
Southeast Slope Cap	7/12/2014	0905	Cobble, gravel, sand, woody detritus	1-2 mm	~ 3 cm gravel with brown sandy gravel beneath	Brownish gray	None observed	Minimal scattered woody detritus, few leaves, algae on surface of cobble	Styrofoam cups, trash on high tide mark, carrot	No evidence	Bird droppings	No apparent change	Good	None
West Sediment Cap	7/12/2014	1138	Gravel, sand, silt, organic matter	0-9 cm observed	Heterogeneous area; gravel appears hummocky (possibly assocated with drainage), similar to 2013. Fine sediment deposits on top of sand occur in between hummocks.	Fines have brown surface, black below.	None observed	Little wood debris	None observed	Barnacles, green sea grass (similar to 2013)	Birds (seagulls, ducks)	None observed. Hummocks noted on field forms have been present since 2012.	Good	

Notes:
-- = not recorded.
[a] Photos are presented in the photo log, in Appendix C.
[b] The orientation of these photos is assumed based on the view shown in the baseline photos. The proximity of the Crowley site sheetpile wall affected the use of a compass in confirming the orientation of the monitoring event photo.

Table 2-3. Slip 4 EAA Institutional Controls

Institutional Control	Objective	Ownership	Mechanism	Status	Monitoring	Enforcement	Responsibility	Termination
Governmental Controls								
Regulated Navigation Area	Protect the integrity of the sediment cap by restricting vessel operations (e.g., anchoring, grounding, spudding)	City of Seattle	Application to U.S. Coast Guard	Approved by Seattle City Council July 8, 2013, signed by Mayor July 16, filed with City Clerk July 17, 2013. Draft Rule was published in the Federal Register April 22, 2014, with a public comment period that ended on July 21, 2014. Documentation of the publication of the Final Rule regarding the Slip 4 EAA RNA was provided in Addendum 3 to the ICIR which was submitted to and approved by EPA on November 20, 2014 (SCL 2014c).	Violations may be reported to the Captain of the Port, Puget Sound, Seattle, Washington.	Those found in violation may be subject to civil or criminal penalties as provided for in 33 U.S. Code 1232.	U.S. Coast Guard	Indefinite
Proprietary Controls								
Property Purchase	Allow control over all land uses and monitoring	City of Seattle	Fee-Simple Purchase	The City of Seattle acquired the bed of the Slip property on October 12, 2007; the lot line adjustment with First South Properties, LLC was approved by Seattle City Council July 8, 2013, signed by Mayor July 16, and filed with City Clerk July 17, 2013. First South Properties, LLC filed the lot line adjustment with the King County Recorder on March 11, 2014. Documentation of the lot line adjustment recording was provided to EPA in an addendum to the ICIR dated March 14, 2014 (SCL 2014b) and approved by EPA March 17. Due to discovery of an error on the March 11 Lot Line Adjustment Deed, a revised copy was recorded with the County on April 1, 2014 and sent to EPA for their files on April 9 (Crowley 2014, pers. comm.).	Not required.	None	City of Seattle - Seattle Public Utilities	Indefinite
Environmental Covenants	Restrict landowners from activities that might compromise the sediment caps, slope caps, and engineered soil covers	City of Seattle; The Boeing Company	Uniform Environmental Covenants Act	The City Environmental Covenant was approved by City Council July 8, 2013, signed by Mayor July 16, filed with City Clerk July 17. EPA signed and finalized the covenant on September 19; the covenant was filed with the King County Recorder September 24, 2013. The Boeing Environmental Covenant was signed and finalized by EPA on December 11, 2013 and filed with the King County Recorder on December 20, 2013. An addendum to the ICIR (Integral 2013b) regarding the Boeing Environmental Covenant was submitted to EPA on January 14, 2014 (SCL 2014a).	The City and Boeing Environmental Covenants will be recorded in Ecology's Integrated Site Information System (ISIS) database. Recording of the City's Environmental Covenant in the ISIS Environmental Covenants database was completed on October 10, 2013. Ecology will monitor the covenants by confirming they are filed along with the publicly available property records.	Landowners have a vested interest in enforcing the covenants in order to avoid fines for breaching the covenant.	Although Ecology has an interest in the covenants, the land owners bear responsibility for maintaining them.	
Enforcement and Permit Tools								
Administrative Orders	A government agency exercises authority by mandating a party to take action and/or restrict use	City of Seattle	EPA or Ecology administers directive	A CERCLA Administrative Settlement Agreement and Order on Consent was issued to the City of Seattle and King County on September 28, 2006.	EPA will review long-term monitoring results no less frequently than every five years.	Administrative orders are enforceable in a court of law.	EPA is enforcing the Slip 4 Administrative Settlement Agreement and Order on Consent; The City of Seattle and King County are responsible for implementing all aspects of the removal action.	Although an administrative order may be terminated at the completion of remediation, periodic reviews ensure the institutional controls for the site remain in place.
Informational Devices								
State Registry	A database of sites of concern for public viewing	Washington State Department of Ecology	Ecology Site Register, the Hazardous Sites list, and the ISIS database	The Lower Duwamish Waterway and Slip 4 are listed on the Hazardous Sites list and in the ISIS database. Public notices will be published in the Site Register as needed.	Ecology monitors sites listed on the Hazardous Sites list.	Informational devices are not legally enforceable and primary serve to inform the public.	Ecology maintains the database.	A site is removed from the Site Register upon reaching a No Further Action status.
Notification Signs	Provides on-site notice to vessel operators of the existence of the sediment cap and prohibition of its disturbance	City of Seattle	Signs installed at the mouth of Slip 4 and near the sediment cap boundaries	Installation completed August 19, 2013. Installation of the CFR citation on the signs was completed on November 20, 2014, as documented in Addendum 3 to the ICIR (SCL 2014c)	The condition of the signs will be monitored as part of the Long-Term Monitoring and Reporting Plan.		Signs were installed and will be maintained by the City.	The signs will remain on site indefinitely until a change in conditions warrants their removal.
Health Advisories	Information is dispersed notifying the public of health risks associated with consumption of fish	Fish Consumption Advisories issued by the State Department of Health	Signs, pamphlets, website, etc. (translated into regional languages)	In place for Lower Duwamish Waterway Superfund site. Additional Site-wide advisories may be implemented under EPA and/or Ecology Consent Decree (s) pursuant to the LDW Record of Decision.	The Washington State Department of Health will review data periodically to determine if the advisory should remain in place.		Advisories are created by government agencies (i.e., Department of Health).	Advisories can be terminated when monitoring activities indicate they are no longer needed.

Notes:
ICIR = Institutional Controls Implementation Report
EPA= U.S. Environmental Protection Agency
LDW = Lower Duwamish Waterway
ROD = Record of Decision
CFR = Code of Federal Regulations
ISIS = Integrated Site Information System

Table 3-1. Dry Weight and Organic Carbon-Normalized PCB Results for Crowley Site Intertidal Sediment Samples

					PCBs										
Location	Sample ID	Sample Date	Sample Depth (inches)	Total Organic Carbon (percent)	Aroclor 1016 (mg/kg)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Total PCBs (U=0) (mg/kg)		Total PCBs (U=0) (mg/kg OC)	
SQS (mg/kg OC)					NA	NA	NA	NA	NA	NA	NA	NA		12	
Preliminary Sediment Screening Levels (mg/kg)					NV	NV	NV	NV	NV	NV	NV	**0.23**		NA	
2013 Laboratory Practical Quantitation Limits (mg/kg)					NV	NV	NV	NV	NV	NV	NV	**0.23**		NA	
IS-1	IS-1	7/23/2013	0–3	3.62	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.16	0.19	**0.35**		9.7	
IS-2	IS-2	7/23/2013	0–3	2.67	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.09	0.13	0.22		8.2	
IS-3	IS-3	7/23/2013	0–3	3.29	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.18	0.2	**0.38**		**11.6**	
IS-4	IS-4	7/23/2013	0–3	2.15	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.34 E	0.56 E	**0.90**	E	**41.9**	E
IS-5	IS-5	7/24/2013	0–3	3.05	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.25	0.24	**0.49**		**16.1**	

Notes:

Table adapted from SLR (2014a, Table 34).
Shaded values in bold text exceed the preliminary sediment screening levels or WA State Sediment Quality Standards.
Sample interval is 0-3 inches; WA State Sediment Quality Standards are based on top 10 cm (4 inches).
Total organic carbon values are based on unvalidated laboratory results; validated results were not provided in the source document (SLR 2014a).

E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
MRL = method reporting limit
NA = not applicable
NV = no available value
OC = organic carbon
PCB = polychlorinated biphenyl
SQS = Washington State Sediment Quality Standards
U = The laboratory report noted that the analyte was not detected at or above the reported result.

APPENDIX A

RAIN GAUGE AND TIDE DATA

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
7/23/2013 0:00	0	7
7/24/2013 0:00	0	7
7/25/2013 0:00	0	7
7/26/2013 0:00	0	7
7/27/2013 0:00	0	7
7/28/2013 0:00	0	7
7/29/2013 0:00	0	7
7/30/2013 0:00	0	7
7/31/2013 0:00	0	7
8/1/2013 0:00	0	7
8/2/2013 0:00	0.07	7
8/3/2013 0:00	0	7
8/4/2013 0:00	0	7
8/5/2013 0:00	0	7
8/6/2013 0:00	0	7
8/7/2013 0:00	0	7
8/8/2013 0:00	0	7
8/9/2013 0:00	0.04	7
8/10/2013 0:00	0.07	7
8/11/2013 0:00	0	124
8/12/2013 0:00	0	7
8/13/2013 0:00	0	7
8/14/2013 0:00	0.02	7
8/15/2013 0:00	0.02	7
8/16/2013 0:00	0	7
8/17/2013 0:00	0	7
8/18/2013 0:00	0	7
8/19/2013 0:00	0	7
8/20/2013 0:00	0	7
8/21/2013 0:00	0	7
8/22/2013 0:00	0	7
8/23/2013 0:00	0	7
8/24/2013 0:00	0	7
8/25/2013 0:00	0.01	124
8/26/2013 0:00	0.03	7
8/27/2013 0:00	0	7
8/28/2013 0:00	0.23	7
8/29/2013 0:00	0.56	7
8/30/2013 0:00	0	7
8/31/2013 0:00	0	7
9/1/2013 0:00	0	7
9/2/2013 0:00	0	7
9/3/2013 0:00	0.1	124
9/4/2013 0:00	0	124
9/5/2013 0:00	0.84	124
9/6/2013 0:00	0.75	7
9/7/2013 0:00	0	7
9/8/2013 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
9/9/2013 0:00	0	124
9/10/2013 0:00	0	7
9/11/2013 0:00	0	7
9/12/2013 0:00	0	124
9/13/2013 0:00	0	124
9/14/2013 0:00	0	7
9/15/2013 0:00	0.21	7
9/16/2013 0:00	0	7
9/17/2013 0:00	0	124
9/18/2013 0:00	0	7
9/19/2013 0:00	0	7
9/20/2013 0:00	0.15	7
9/21/2013 0:00	0	7
9/22/2013 0:00	0.43	7
9/23/2013 0:00	0.06	7
9/24/2013 0:00	0	124
9/25/2013 0:00	0.04	7
9/26/2013 0:00	0	7
9/27/2013 0:00	0.05	7
9/28/2013 0:00	1.38	7
9/29/2013 0:00	0.69	7
9/30/2013 0:00	0.59	7
10/1/2013 0:00	0.09	7
10/2/2013 0:00	0.34	7
10/3/2013 0:00	0	7
10/4/2013 0:00	0	124
10/5/2013 0:00	0	7
10/6/2013 0:00	0.11	7
10/7/2013 0:00	0.01	7
10/8/2013 0:00	0.32	7
10/9/2013 0:00	0	7
10/10/2013 0:00	0.06	124
10/11/2013 0:00	0.39	7
10/12/2013 0:00	0.06	7
10/13/2013 0:00	0	7
10/14/2013 0:00	0	7
10/15/2013 0:00	0	7
10/16/2013 0:00	0	7
10/17/2013 0:00	0	7
10/18/2013 0:00	0	7
10/19/2013 0:00	0	7
10/20/2013 0:00	0	7
10/21/2013 0:00	0	7
10/22/2013 0:00	0	124
10/23/2013 0:00	0	7
10/24/2013 0:00	0	7
10/25/2013 0:00	0	7
10/26/2013 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
10/27/2013 0:00	0.05	7
10/28/2013 0:00	0	7
10/29/2013 0:00	0	7
10/30/2013 0:00	0.01	7
10/31/2013 0:00	0	7
11/1/2013 0:00	0.04	7
11/2/2013 0:00	0.38	7
11/3/2013 0:00	0.03	7
11/4/2013 0:00	0.01	7
11/5/2013 0:00	0.06	7
11/6/2013 0:00	0.08	130
11/7/2013 0:00	1	7
11/8/2013 0:00	0	7
11/9/2013 0:00	0.08	7
11/10/2013 0:00	0	7
11/11/2013 0:00	0	7
11/12/2013 0:00	0.13	7
11/13/2013 0:00	0	7
11/14/2013 0:00	0.01	7
11/15/2013 0:00	0.09	7
11/16/2013 0:00	0	7
11/17/2013 0:00	0.06	7
11/18/2013 0:00	0.91	130
11/19/2013 0:00	0.09	130
11/20/2013 0:00	0	7
11/21/2013 0:00	0	7
11/22/2013 0:00	0	7
11/23/2013 0:00	0	7
11/24/2013 0:00	0	7
11/25/2013 0:00	0	7
11/26/2013 0:00	0	7
11/27/2013 0:00	0	7
11/28/2013 0:00	0	7
11/29/2013 0:00	0	7
11/30/2013 0:00	0.06	7
12/1/2013 0:00	0.04	7
12/2/2013 0:00	0.17	7
12/3/2013 0:00	0	7
12/4/2013 0:00	0	7
12/5/2013 0:00	0	7
12/6/2013 0:00	0	7
12/7/2013 0:00	0	7
12/8/2013 0:00	0	7
12/9/2013 0:00	0	7
12/10/2013 0:00	0	7
12/11/2013 0:00	0	7
12/12/2013 0:00	0.22	7
12/13/2013 0:00	0.01	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
12/14/2013 0:00	0	7
12/15/2013 0:00	0.04	7
12/16/2013 0:00	0.01	7
12/17/2013 0:00	0	7
12/18/2013 0:00	0.02	7
12/19/2013 0:00	0	7
12/20/2013 0:00	0.15	7
12/21/2013 0:00	0.21	7
12/22/2013 0:00	0.25	7
12/23/2013 0:00	0.03	7
12/24/2013 0:00	0	7
12/25/2013 0:00	0	7
12/26/2013 0:00	0	7
12/27/2013 0:00	0.01	7
12/28/2013 0:00	0	7
12/29/2013 0:00	0	7
12/30/2013 0:00	0.01	7
12/31/2013 0:00	0	7
1/1/2014 0:00	0.01	7
1/2/2014 0:00	0.49	7
1/3/2014 0:00	0.04	7
1/4/2014 0:00	0	7
1/5/2014 0:00	0	7
1/6/2014 0:00	0	7
1/7/2014 0:00	0.36	7
1/8/2014 0:00	0.45	124
1/9/2014 0:00	0.15	7
1/10/2014 0:00	0.16	7
1/11/2014 0:00	0.86	7
1/12/2014 0:00	0.03	7
1/13/2014 0:00	0	7
1/14/2014 0:00	0	7
1/15/2014 0:00	0	7
1/16/2014 0:00	0	7
1/17/2014 0:00	0	7
1/18/2014 0:00	0	7
1/19/2014 0:00	0	7
1/20/2014 0:00	0	7
1/21/2014 0:00	0	7
1/22/2014 0:00	0	7
1/23/2014 0:00	0	7
1/24/2014 0:00	0	7
1/25/2014 0:00	0	7
1/26/2014 0:00	0	7
1/27/2014 0:00	0	7
1/28/2014 0:00	0.35	7
1/29/2014 0:00	0.75	7
1/30/2014 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
1/31/2014 0:00	0.03	7
2/1/2014 0:00	0.03	7
2/2/2014 0:00	0	7
2/3/2014 0:00	0	7
2/4/2014 0:00	0	7
2/5/2014 0:00	0	7
2/6/2014 0:00	0	7
2/7/2014 0:00	0	7
2/8/2014 0:00	0.01	7
2/9/2014 0:00	0.18	7
2/10/2014 0:00	0.55	7
2/11/2014 0:00	0.81	7
2/12/2014 0:00	0.14	7
2/13/2014 0:00	0	7
2/14/2014 0:00	0.4	7
2/15/2014 0:00	0.51	7
2/16/2014 0:00	1.4	7
2/17/2014 0:00	0.5	7
2/18/2014 0:00	0.69	7
2/19/2014 0:00	0.03	7
2/20/2014 0:00	0.05	7
2/21/2014 0:00	0.23	7
2/22/2014 0:00	0.11	7
2/23/2014 0:00	0.22	7
2/24/2014 0:00	0.41	7
2/25/2014 0:00	0.01	7
2/26/2014 0:00	0	7
2/27/2014 0:00	0	7
2/28/2014 0:00	0	7
3/1/2014 0:00	0.01	7
3/2/2014 0:00	0.75	7
3/3/2014 0:00	0.44	7
3/4/2014 0:00	0.44	7
3/5/2014 0:00	1.53	7
3/6/2014 0:00	0.23	7
3/7/2014 0:00	0	7
3/8/2014 0:00	1.19	7
3/9/2014 0:00	0.26	7
3/10/2014 0:00	0.44	7
3/11/2014 0:00	0	7
3/12/2014 0:00	0	7
3/13/2014 0:00	0	7
3/14/2014 0:00	0.14	7
3/15/2014 0:00	0.21	7
3/16/2014 0:00	0.98	7
3/17/2014 0:00	0.01	7
3/18/2014 0:00	0	85
3/19/2014 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
3/20/2014 0:00	0	7
3/21/2014 0:00	0	7
3/22/2014 0:00	0	7
3/23/2014 0:00	0	7
3/24/2014 0:00	0	7
3/25/2014 0:00	0.23	7
3/26/2014 0:00	0.06	7
3/27/2014 0:00	0.02	7
3/28/2014 0:00	0.55	7
3/29/2014 0:00	0.68	7
3/30/2014 0:00	0	7
3/31/2014 0:00	0	7
4/1/2014 0:00	0	7
4/2/2014 0:00	0	7
4/3/2014 0:00	0.13	7
4/4/2014 0:00	0	7
4/5/2014 0:00	0.07	7
4/6/2014 0:00	0	7
4/7/2014 0:00	0	7
4/8/2014 0:00	0.35	130
4/9/2014 0:00	0	7
4/10/2014 0:00	0	7
4/11/2014 0:00	0	7
4/12/2014 0:00	0	7
4/13/2014 0:00	0	7
4/14/2014 0:00	0	7
4/15/2014 0:00	0	7
4/16/2014 0:00	0.44	7
4/17/2014 0:00	0.7	7
4/18/2014 0:00	0	7
4/19/2014 0:00	0.38	7
4/20/2014 0:00	0	7
4/21/2014 0:00	0.16	7
4/22/2014 0:00	0.51	7
4/23/2014 0:00	0.26	7
4/24/2014 0:00	0.24	7
4/25/2014 0:00	0	7
4/26/2014 0:00	0.19	7
4/27/2014 0:00	0	7
4/28/2014 0:00	0	7
4/29/2014 0:00	0	7
4/30/2014 0:00	0	7
5/1/2014 0:00	0	7
5/2/2014 0:00	0	7
5/3/2014 0:00	1.19	7
5/4/2014 0:00	0.26	7
5/5/2014 0:00	0.41	7
5/6/2014 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
5/7/2014 0:00	0	7
5/8/2014 0:00	0.39	7
5/9/2014 0:00	0.05	7
5/10/2014 0:00	0.01	7
5/11/2014 0:00	0	7
5/12/2014 0:00	0	7
5/13/2014 0:00	0	7
5/14/2014 0:00	0	7
5/15/2014 0:00	0	7
5/16/2014 0:00	0	7
5/17/2014 0:00	0	7
5/18/2014 0:00	0.03	7
5/19/2014 0:00	0	7
5/20/2014 0:00	0	7
5/21/2014 0:00	0	7
5/22/2014 0:00	0	7
5/23/2014 0:00	0.17	7
5/24/2014 0:00	0	7
5/25/2014 0:00	0.26	7
5/26/2014 0:00	0	7
5/27/2014 0:00	0.08	7
5/28/2014 0:00	0.03	7
5/29/2014 0:00	0	7
5/30/2014 0:00	0	7
5/31/2014 0:00	0	7
6/1/2014 0:00	0	7
6/2/2014 0:00	0	7
6/3/2014 0:00	0	7
6/4/2014 0:00	0	7
6/5/2014 0:00	0	7
6/6/2014 0:00	0	7
6/7/2014 0:00	0	7
6/8/2014 0:00	0	7
6/9/2014 0:00	0	7
6/10/2014 0:00	0	7
6/11/2014 0:00	0	7
6/12/2014 0:00	0	7
6/13/2014 0:00	0.16	7
6/14/2014 0:00	0	7
6/15/2014 0:00	0.2	7
6/16/2014 0:00	0.07	7
6/17/2014 0:00	0.05	7
6/18/2014 0:00	0	7
6/19/2014 0:00	0.02	7
6/20/2014 0:00	0	7
6/21/2014 0:00	0	7
6/22/2014 0:00	0	7
6/23/2014 0:00	0	7

Appendix A. Rain Gauge and Tide Data

	RG16 Rainfall (in.)	
Time and Date	Total	Quality Code[a]
6/24/2014 0:00	0	7
6/25/2014 0:00	0	7
6/26/2014 0:00	0	7
6/27/2014 0:00	0.05	7
6/28/2014 0:00	0.01	7
6/29/2014 0:00	0	7
6/30/2014 0:00	0	7
7/1/2014 0:00	0	7
7/2/2014 0:00	0	7
7/3/2014 0:00	0	7
7/4/2014 0:00	0	7
7/5/2014 0:00	0	7
7/6/2014 0:00	0	7
7/7/2014 0:00	0	7
7/8/2014 0:00	0	7
7/9/2014 0:00	0	7
7/10/2014 0:00	0	7
7/11/2014 0:00	0	7
7/12/2014 0:00	0	7
7/13/2014 0:00	0	7
7/14/2014 0:00	0	7
7/15/2014 0:00	0	7
7/16/2014 0:00	0	7
7/17/2014 0:00	0	7
7/18/2014 0:00	0	7
7/19/2014 0:00	0	7
7/20/2014 0:00	0	7
7/21/2014 0:00	0	7
7/22/2014 0:00	0.01	7
7/23/2014 0:00	0.71	7
Max Total Rainfall:	*1.53*	

Notes:

[a] Quality Codes (assigned during QA/QC) (Hinson 2014):
7 = verified good quality final data
85 = bad or test data removed
124 = reading point transposed from nearby sensor
130 = record estimated but not transposed

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2013

The NOAA Tide Predictions application provides predictions in both graphical and tabular formats, with many user selected options, for over 3000 stations broken down by key areas in each state. Users can also access stations via the Google map interface. Additional information can be found in the help page.

Station Types: The NOAA Tide Predictions application provides predictions from 2 distinct categories of stations at over 3000 locations:
Harmonic - The predicted height values for Harmonic stations are conducted by combining the harmonic constituents into a single tide curve.
Subordinate - The high and low height values for Subordinate stations are obtained by means and differences, and ratios applied to the full harmonic constant predictions at a specific Harmonic station (a Reference station).

Disclaimer: The official Tide prediction tables are published annually on October 1, for the following calendar year. Tide predictions generated prior to the publishing date of the official tables are subject to change. The predictions from the web based NOAA Tidal Predictions are based upon the latest information available as of the date of your request. Tide predictions generated may differ from the official published predictions if information for the station requested has been updated since the publishing date of the official published tables.

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2013

Times and Heights of High and Low Waters

July

	Time (h m)	Height (ft)	Height (cm)
1 M	07:07 AM	1.4	43
	01:51 PM	7.9	241
	06:35 PM	5.2	158
2 Tu	12:42 AM	10.9	332
	08:02 AM	0.7	21
	03:23 PM	8.6	262
	07:57 PM	6.1	186
3 W	01:28 AM	10.5	320
	08:50 AM	0.1	3
	04:31 PM	9.4	287
	09:16 PM	6.6	201
4 Th	02:14 AM	10.2	311
	09:32 AM	-0.4	-12
	05:22 PM	10.1	308
	10:19 PM	6.7	204
5 F	02:58 AM	9.9	302
	10:10 AM	-0.7	-21
	06:02 PM	10.5	320
	11:09 PM	6.7	204
6 Sa	03:40 AM	9.7	296
	10:45 AM	-1.0	-30
	06:34 PM	10.7	326
	11:49 PM	6.6	201
7 Su	04:20 AM	9.6	293
	11:19 AM	-1.1	-34
	07:00 PM	10.8	329
8 M ●	12:24 AM	6.4	195
	04:59 AM	9.5	290
	11:53 AM	-1.2	-37
	07:23 PM	10.9	332
9 Tu	12:56 AM	6.1	186
	05:39 AM	9.4	287
	12:27 PM	-1.1	-34
	07:46 PM	11.0	335
10 W	01:29 AM	5.8	177
	06:20 AM	9.2	280
	01:02 PM	-0.8	-24
	08:12 PM	11.2	341
11 Th	02:04 AM	5.3	162
	07:03 AM	8.9	271
	01:38 PM	-0.3	-9
	08:40 PM	11.3	344
12 F	02:43 AM	4.7	143
	07:50 AM	8.6	262
	02:15 PM	0.4	12
	09:11 PM	11.4	347
13 Sa	03:25 AM	4.1	125
	08:43 AM	8.3	253
	02:54 PM	1.3	40
	09:43 PM	11.4	347
14 Su	04:11 AM	3.3	101
	09:43 AM	7.9	241
	03:35 PM	2.5	76
	10:18 PM	11.3	344
15 M	05:01 AM	2.5	76
	10:52 AM	7.7	235
	04:22 PM	3.8	116
	10:57 PM	11.1	338
16 Tu ◐	05:55 AM	1.6	49
	12:14 PM	7.8	238
	05:18 PM	5.1	155
	11:40 PM	11.0	335
17 W	06:51 AM	0.6	18
	01:45 PM	8.2	250
	06:30 PM	6.1	186
18 Th	12:28 AM	10.9	332
	07:48 AM	-0.4	-12
	03:12 PM	9.0	274
	07:51 PM	6.8	207
19 F	01:22 AM	10.9	332
	08:43 AM	-1.4	-43
	04:18 PM	9.8	299
	09:07 PM	6.9	210
20 Sa	02:19 AM	11.0	335
	09:36 AM	-2.2	-67
	05:08 PM	10.6	323
	10:11 PM	6.6	201
21 Su	03:16 AM	11.1	338
	10:26 AM	-2.7	-82
	05:50 PM	11.2	341
	11:07 PM	6.1	186
22 M ○	04:12 AM	11.1	338
	11:14 AM	-2.9	-88
	06:30 PM	11.6	354
	11:59 PM	5.4	165
23 Tu	05:09 AM	10.9	332
	12:02 PM	-2.7	-82
	07:08 PM	11.9	363
24 W	12:50 AM	4.7	143
	06:05 AM	10.6	323
	12:48 PM	-2.0	-61
	07:45 PM	12.0	366
25 Th	01:40 AM	3.9	119
	07:03 AM	10.2	311
	01:34 PM	-1.0	-30
	08:23 PM	12.0	366
26 F	02:31 AM	3.2	98
	08:04 AM	9.6	293
	02:20 PM	0.3	9
	09:01 PM	11.9	363
27 Sa	03:23 AM	2.5	76
	09:08 AM	8.9	271
	03:07 PM	1.8	55
	09:40 PM	11.6	354
28 Su	04:17 AM	2.0	61
	10:19 AM	8.4	256
	03:57 PM	3.4	104
	10:21 PM	11.2	341
29 M ◑	05:14 AM	1.6	49
	11:44 AM	8.1	247
	04:56 PM	4.8	146
	11:06 PM	10.7	326
30 Tu	06:12 AM	1.3	40
	01:27 PM	8.2	250
	06:10 PM	6.0	183
	11:56 PM	10.2	311
31 W	07:12 AM	0.9	27
	03:02 PM	8.8	268
	07:44 PM	6.6	201

August

	Time (h m)	Height (ft)	Height (cm)
1 Th	12:50 AM	9.7	296
	08:08 AM	0.6	18
	04:08 PM	9.4	287
	09:08 PM	6.7	204
2 F	01:45 AM	9.5	290
	08:58 AM	0.3	9
	04:56 PM	9.9	302
	10:08 PM	6.5	198
3 Sa	02:38 AM	9.4	287
	09:42 AM	0.0	0
	05:31 PM	10.2	311
	10:52 PM	6.2	189
4 Su	03:26 AM	9.4	287
	10:20 AM	-0.3	-9
	05:59 PM	10.4	317
	11:26 PM	5.9	180
5 M	04:10 AM	9.4	287
	10:56 AM	-0.4	-12
	06:21 PM	10.5	320
	11:54 PM	5.6	171
6 Tu ●	04:51 AM	9.5	290
	11:31 AM	-0.4	-12
	06:40 PM	10.7	326
7 W	12:22 AM	5.1	155
	05:31 AM	9.5	290
	12:05 PM	-0.3	-9
	07:02 PM	10.8	329
8 Th	12:52 AM	4.5	137
	06:11 AM	9.5	290
	12:39 PM	0.1	3
	07:26 PM	11.0	335
9 F	01:25 AM	3.9	119
	06:54 AM	9.4	287
	01:15 PM	0.6	18
	07:53 PM	11.1	338
10 Sa	02:02 AM	3.1	94
	07:41 AM	9.3	283
	01:52 PM	1.4	43
	08:23 PM	11.2	341
11 Su	02:43 AM	2.4	73
	08:32 AM	9.0	274
	02:30 PM	2.4	73
	08:55 PM	11.1	338
12 M	03:27 AM	1.8	55
	09:30 AM	8.8	268
	03:13 PM	3.6	110
	09:30 PM	11.0	335
13 Tu	04:17 AM	1.2	37
	10:36 AM	8.6	262
	04:01 PM	4.8	146
	10:11 PM	10.8	329
14 W ◐	05:13 AM	0.6	18
	11:56 AM	8.5	259
	05:02 PM	5.9	180
	11:00 PM	10.5	320
15 Th	06:14 AM	0.1	3
	01:28 PM	8.7	265
	06:22 PM	6.6	201
16 F	12:00 AM	10.3	314
	07:18 AM	-0.4	-12
	02:55 PM	9.3	283
	07:51 PM	6.8	207
17 Sa	01:06 AM	10.2	311
	08:20 AM	-1.0	-30
	03:56 PM	10.0	305
	09:07 PM	6.4	195
18 Su	02:14 AM	10.3	314
	09:18 AM	-1.4	-43
	04:41 PM	10.6	323
	10:06 PM	5.6	171
19 M	03:17 AM	10.5	320
	10:10 AM	-1.7	-52
	05:19 PM	11.0	335
	10:56 PM	4.8	146
20 Tu	04:16 AM	10.7	326
	10:59 AM	-1.5	-46
	05:54 PM	11.4	347
	11:42 PM	3.8	116
21 W ○	05:12 AM	10.7	326
	11:45 AM	-1.1	-34
	06:28 PM	11.6	354
22 Th	12:27 AM	2.9	88
	06:07 AM	10.6	323
	12:30 PM	-0.3	-9
	07:01 PM	11.6	354
23 F	01:11 AM	2.2	67
	07:02 AM	10.3	314
	01:14 PM	0.8	24
	07:36 PM	11.6	354
24 Sa	01:56 AM	1.6	49
	07:58 AM	10.0	305
	01:59 PM	2.0	61
	08:12 PM	11.3	344
25 Su	02:41 AM	1.2	37
	08:56 AM	9.5	290
	02:45 PM	3.3	101
	08:50 PM	10.9	332
26 M	03:27 AM	1.0	30
	09:59 AM	9.1	277
	03:35 PM	4.5	137
	09:31 PM	10.4	317
27 Tu	04:17 AM	1.0	30
	11:12 AM	8.8	268
	04:35 PM	5.6	171
	10:17 PM	9.8	299
28 W ◑	05:12 AM	1.2	37
	12:43 PM	8.7	265
	05:55 PM	6.3	192
	11:11 PM	9.2	280
29 Th	06:13 AM	1.3	40
	02:15 PM	9.0	274
	07:37 PM	6.5	198
30 F	12:15 AM	8.8	268
	07:17 AM	1.3	40
	03:22 PM	9.4	287
	08:56 PM	6.3	192
31 Sa	01:21 AM	8.6	262
	08:16 AM	1.1	34
	04:08 PM	9.7	296
	09:48 PM	5.8	177

September

	Time (h m)	Height (ft)	Height (cm)
1 Su	02:23 AM	8.7	265
	09:07 AM	0.9	27
	04:40 PM	10.0	305
	10:24 PM	5.3	162
2 M	03:16 AM	8.9	271
	09:50 AM	0.7	21
	05:04 PM	10.1	308
	10:53 PM	4.8	146
3 Tu	04:02 AM	9.2	280
	10:29 AM	0.7	21
	05:24 PM	10.3	314
	11:18 PM	4.2	128
4 W	04:44 AM	9.5	290
	11:05 AM	0.8	24
	05:45 PM	10.5	320
	11:45 PM	3.5	107
5 Th ●	05:24 AM	9.7	296
	11:40 AM	1.1	34
	06:08 PM	10.7	326
6 F	12:15 AM	2.7	82
	06:06 AM	9.9	302
	12:15 PM	1.5	46
	06:33 PM	10.8	329
7 Sa	12:48 AM	1.9	58
	06:49 AM	10.0	305
	12:52 PM	2.2	67
	07:02 PM	10.9	332
8 Su	01:25 AM	1.1	34
	07:35 AM	10.0	305
	01:31 PM	3.0	91
	07:33 PM	10.9	332
9 M	02:06 AM	0.5	15
	08:26 AM	10.0	305
	02:13 PM	3.9	119
	08:07 PM	10.8	329
10 Tu	02:51 AM	0.1	3
	09:22 AM	9.8	299
	03:00 PM	4.8	146
	08:46 PM	10.5	320
11 W	03:41 AM	-0.1	-3
	10:27 AM	9.5	290
	03:55 PM	5.7	174
	09:33 PM	10.1	308
12 Th ◐	04:38 AM	-0.2	-6
	11:43 AM	9.4	287
	05:06 PM	6.3	192
	10:32 PM	9.7	296
13 F	05:42 AM	-0.1	-3
	01:08 PM	9.5	290
	06:35 PM	6.5	198
	11:46 PM	9.4	287
14 Sa	06:51 AM	-0.1	-3
	02:24 PM	9.9	302
	08:02 PM	6.0	183
15 Su	01:05 AM	9.3	283
	07:58 AM	-0.1	-3
	03:20 PM	10.3	314
	09:08 PM	5.1	155
16 M	02:21 AM	9.5	290
	08:59 AM	-0.1	-3
	04:02 PM	10.7	326
	09:59 PM	4.0	122
17 Tu	03:28 AM	9.9	302
	09:53 AM	0.1	3
	04:38 PM	11.0	335
	10:43 PM	2.9	88
18 W	04:27 AM	10.2	311
	10:42 AM	0.5	15
	05:10 PM	11.2	341
	11:23 PM	1.9	58
19 Th ○	05:22 AM	10.5	320
	11:28 AM	1.1	34
	05:42 PM	11.3	344
20 F	12:02 AM	1.0	30
	06:13 AM	10.6	323
	12:13 PM	2.0	61
	06:14 PM	11.2	341
21 Sa	12:41 AM	0.4	12
	07:03 AM	10.6	323
	12:56 PM	2.9	88
	06:47 PM	11.0	335
22 Su	01:20 AM	0.0	0
	07:53 AM	10.5	320
	01:41 PM	3.9	119
	07:22 PM	10.6	323
23 M	01:59 AM	0.0	0
	08:44 AM	10.3	314
	02:28 PM	4.8	146
	07:59 PM	10.1	308
24 Tu	02:41 AM	0.1	3
	09:38 AM	10.0	305
	03:19 PM	5.5	168
	08:41 PM	9.5	290
25 W	03:26 AM	0.4	12
	10:38 AM	9.7	296
	04:21 PM	6.1	186
	09:29 PM	8.9	271
26 Th	04:16 AM	0.9	27
	11:48 AM	9.5	290
	05:44 PM	6.4	195
	10:27 PM	8.3	253
27 F ◑	05:13 AM	1.4	43
	01:04 PM	9.4	287
	07:22 PM	6.2	189
	11:38 PM	7.9	241
28 Sa	06:17 AM	1.8	55
	02:09 PM	9.5	290
	08:31 PM	5.7	174
29 Su	12:54 AM	7.8	238
	07:22 AM	1.9	58
	02:56 PM	9.7	296
	09:16 PM	5.0	152
30 M	02:04 AM	8.0	244
	08:21 AM	2.0	61
	03:29 PM	9.9	302
	09:48 PM	4.3	131

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2013

Times and Heights of High and Low Waters

October

	Time (h m)	Height (ft)	Height (cm)
1 Tu	03:02 AM	8.5	259
	09:11 AM	2.1	64
	03:56 PM	10.1	308
	10:14 PM	3.5	107
2 W	03:52 AM	9.0	274
	09:54 AM	2.2	67
	04:21 PM	10.3	314
	10:40 PM	2.6	79
3 Th	04:37 AM	9.5	290
	10:34 AM	2.5	76
	04:45 PM	10.5	320
	11:08 PM	1.6	49
4 F	05:19 AM	10.0	305
	11:12 AM	2.9	88
	05:12 PM	10.7	326
	11:40 PM	0.7	21
5 Sa ●	06:01 AM	10.4	317
	11:52 AM	3.4	104
	05:40 PM	10.8	329
6 Su	12:15 AM	-0.2	-6
	06:46 AM	10.7	326
	12:32 PM	4.0	122
	06:12 PM	10.9	332
7 M	12:53 AM	-0.8	-24
	07:33 AM	10.9	332
	01:15 PM	4.6	140
	06:47 PM	10.8	329
8 Tu	01:36 AM	-1.3	-40
	08:23 AM	10.9	332
	02:02 PM	5.3	162
	07:26 PM	10.5	320
9 W	02:22 AM	-1.4	-43
	09:19 AM	10.8	329
	02:56 PM	5.8	177
	08:11 PM	10.1	308
10 Th	03:13 AM	-1.1	-34
	10:21 AM	10.6	323
	03:59 PM	6.2	189
	09:07 PM	9.5	290
11 F ◐	04:10 AM	-0.6	-18
	11:29 AM	10.4	317
	05:18 PM	6.2	189
	10:18 PM	8.9	271
12 Sa	05:14 AM	0.0	0
	12:40 PM	10.4	317
	06:47 PM	5.7	174
	11:43 PM	8.5	259
13 Su	06:23 AM	0.6	18
	01:44 PM	10.6	323
	08:03 PM	4.7	143
14 M	01:12 AM	8.5	259
	07:32 AM	1.2	37
	02:35 PM	10.8	329
	09:00 PM	3.5	107
15 Tu	02:34 AM	8.9	271
	08:37 AM	1.7	52
	03:17 PM	11.1	338
	09:45 PM	2.3	70
16 W	03:44 AM	9.4	287
	09:35 AM	2.2	67
	03:52 PM	11.2	341
	10:25 PM	1.1	34
17 Th	04:43 AM	10.0	305
	10:26 AM	2.9	88
	04:25 PM	11.2	341
	11:02 PM	0.2	6
18 F ○	05:35 AM	10.5	320
	11:14 AM	3.6	110
	04:57 PM	11.1	338
	11:37 PM	-0.5	-15
19 Sa	06:23 AM	10.8	329
	11:59 AM	4.3	131
	05:29 PM	10.9	332
20 Su	12:12 AM	-0.9	-27
	07:07 AM	11.0	335
	12:43 PM	4.9	149
	06:02 PM	10.5	320
21 M	12:47 AM	-1.0	-30
	07:50 AM	11.0	335
	01:29 PM	5.5	168
	06:37 PM	10.1	308
22 Tu	01:24 AM	-0.9	-27
	08:33 AM	10.9	332
	02:16 PM	5.9	180
	07:14 PM	9.6	293
23 W	02:03 AM	-0.6	-18
	09:18 AM	10.8	329
	03:07 PM	6.2	189
	07:56 PM	9.0	274
24 Th	02:44 AM	-0.1	-3
	10:06 AM	10.5	320
	04:07 PM	6.4	195
	08:45 PM	8.4	256
25 F	03:30 AM	0.6	18
	10:58 AM	10.3	314
	05:21 PM	6.3	192
	09:44 PM	7.8	238
26 Sa ◑	04:20 AM	1.3	40
	11:53 AM	10.2	311
	06:43 PM	5.9	180
	10:56 PM	7.4	226
27 Su	05:17 AM	2.0	61
	12:47 PM	10.1	308
	07:46 PM	5.2	158
28 M	12:17 AM	7.2	219
	06:19 AM	2.6	79
	01:34 PM	10.2	311
	08:30 PM	4.3	131
29 Tu	01:36 AM	7.5	229
	07:22 AM	3.1	94
	02:13 PM	10.3	314
	09:02 PM	3.4	104
30 W	02:44 AM	8.1	247
	08:21 AM	3.6	110
	02:47 PM	10.5	320
	09:32 PM	2.3	70
31 Th	03:40 AM	8.8	268
	09:13 AM	4.0	122
	03:18 PM	10.7	326
	10:02 PM	1.2	37

November

	Time (h m)	Height (ft)	Height (cm)
1 F	04:29 AM	9.6	293
	10:00 AM	4.4	134
	03:48 PM	10.9	332
	10:34 PM	0.0	0
2 Sa	05:15 AM	10.3	314
	10:45 AM	4.8	146
	04:20 PM	11.0	335
	11:09 PM	-1.0	-30
3 Su ●	04:59 AM	10.9	332
	10:29 AM	5.3	162
	03:53 PM	11.1	338
	10:47 PM	-1.8	-55
4 M	05:44 AM	11.4	347
	11:15 AM	5.7	174
	04:30 PM	11.1	338
	11:29 PM	-2.3	-70
5 Tu	06:31 AM	11.7	357
	12:03 PM	6.0	183
	05:11 PM	10.9	332
6 W	12:13 AM	-2.5	-76
	07:20 AM	11.8	360
	12:56 PM	6.2	189
	05:57 PM	10.5	320
7 Th	01:01 AM	-2.3	-70
	08:13 AM	11.7	357
	01:54 PM	6.3	192
	06:50 PM	9.9	302
8 F	01:52 AM	-1.7	-52
	09:09 AM	11.6	354
	03:02 PM	6.1	186
	07:54 PM	9.2	280
9 Sa	02:46 AM	-0.7	-21
	10:06 AM	11.5	351
	04:19 PM	5.6	171
	09:12 PM	8.5	259
10 Su ◐	03:46 AM	0.4	12
	11:03 AM	11.4	347
	05:38 PM	4.7	143
	10:43 PM	8.0	244
11 M	04:52 AM	1.7	52
	11:58 AM	11.4	347
	06:46 PM	3.4	104
12 Tu	12:20 AM	8.0	244
	06:02 AM	2.8	85
	12:46 PM	11.4	347
	07:41 PM	2.1	64
13 W	01:50 AM	8.6	262
	07:12 AM	3.7	113
	01:29 PM	11.4	347
	08:26 PM	0.9	27
14 Th	03:03 AM	9.4	287
	08:16 AM	4.5	137
	02:08 PM	11.3	344
	09:05 PM	0.0	0
15 F	04:01 AM	10.2	311
	09:13 AM	5.1	155
	02:43 PM	11.2	341
	09:40 PM	-0.7	-21
16 Sa	04:51 AM	10.8	329
	10:05 AM	5.6	171
	03:17 PM	10.9	332
	10:14 PM	-1.2	-37
17 Su ○	05:34 AM	11.2	341
	10:52 AM	6.0	183
	03:51 PM	10.6	323
	10:47 PM	-1.4	-43
18 M	06:12 AM	11.4	347
	11:37 AM	6.3	192
	04:25 PM	10.3	314
	11:21 PM	-1.4	-43
19 Tu	06:47 AM	11.5	351
	12:20 PM	6.5	198
	05:02 PM	9.9	302
	11:56 PM	-1.2	-37
20 W	07:21 AM	11.5	351
	01:04 PM	6.6	201
	05:41 PM	9.4	287
21 Th	12:33 AM	-0.9	-27
	07:57 AM	11.4	347
	01:51 PM	6.5	198
	06:23 PM	8.9	271
22 F	01:12 AM	-0.3	-9
	08:34 AM	11.3	344
	02:41 PM	6.4	195
	07:11 PM	8.4	256
23 Sa	01:53 AM	0.3	9
	09:15 AM	11.2	341
	03:38 PM	6.0	183
	08:07 PM	7.8	238
24 Su	02:37 AM	1.2	37
	09:57 AM	11.1	338
	04:39 PM	5.5	168
	09:15 PM	7.4	226
25 M ◑	03:25 AM	2.1	64
	10:40 AM	11.0	335
	05:37 PM	4.8	146
	10:34 PM	7.1	216
26 Tu	04:18 AM	3.1	94
	11:23 AM	10.9	332
	06:27 PM	3.8	116
	11:58 PM	7.3	223
27 W	05:19 AM	4.1	125
	12:03 PM	10.9	332
	07:08 PM	2.7	82
28 Th	01:19 AM	7.9	241
	06:24 AM	5.0	152
	12:42 PM	11.0	335
	07:47 PM	1.5	46
29 F	02:27 AM	8.8	268
	07:28 AM	5.7	174
	01:20 PM	11.1	338
	08:24 PM	0.2	6
30 Sa	03:23 AM	9.7	296
	08:26 AM	6.1	186
	01:57 PM	11.3	344
	09:03 PM	-1.0	-30

December

	Time (h m)	Height (ft)	Height (cm)
1 Su	04:11 AM	10.6	323
	09:20 AM	6.5	198
	02:36 PM	11.4	347
	09:43 PM	-2.0	-61
2 M	04:56 AM	11.3	344
	10:11 AM	6.7	204
	03:17 PM	11.5	351
	10:25 PM	-2.7	-82
3 Tu ●	05:41 AM	11.9	363
	11:01 AM	6.7	204
	04:02 PM	11.4	347
	11:09 PM	-3.1	-94
4 W	06:26 AM	12.2	372
	11:53 AM	6.6	201
	04:50 PM	11.2	341
	11:55 PM	-3.0	-91
5 Th	07:11 AM	12.4	378
	12:48 PM	6.4	195
	05:43 PM	10.7	326
6 F	12:43 AM	-2.5	-76
	07:58 AM	12.5	381
	01:46 PM	6.0	183
	06:42 PM	10.0	305
7 Sa	01:33 AM	-1.6	-49
	08:45 AM	12.4	378
	02:50 PM	5.4	165
	07:49 PM	9.2	280
8 Su	02:24 AM	-0.3	-9
	09:33 AM	12.3	375
	03:58 PM	4.6	140
	09:07 PM	8.4	256
9 M ◐	03:19 AM	1.3	40
	10:21 AM	12.2	372
	05:09 PM	3.6	110
	10:38 PM	7.9	241
10 Tu	04:20 AM	2.9	88
	11:10 AM	11.9	363
	06:14 PM	2.4	73
11 W	12:23 AM	8.0	244
	05:30 AM	4.4	134
	11:57 AM	11.7	357
	07:11 PM	1.3	40
12 Th	02:01 AM	8.7	265
	06:47 AM	5.5	168
	12:43 PM	11.5	351
	07:59 PM	0.4	12
13 F	03:16 AM	9.7	296
	08:03 AM	6.3	192
	01:27 PM	11.2	341
	08:41 PM	-0.4	-12
14 Sa	04:13 AM	10.5	320
	09:08 AM	6.7	204
	02:08 PM	10.9	332
	09:18 PM	-0.8	-24
15 Su	04:58 AM	11.1	338
	10:03 AM	6.9	210
	02:47 PM	10.6	323
	09:53 PM	-1.1	-34
16 M	05:37 AM	11.5	351
	10:50 AM	6.9	210
	03:25 PM	10.4	317
	10:26 PM	-1.2	-37
17 Tu ○	06:09 AM	11.6	354
	11:31 AM	6.9	210
	04:03 PM	10.1	308
	11:00 PM	-1.2	-37
18 W	06:37 AM	11.7	357
	12:09 PM	6.8	207
	04:41 PM	9.8	299
	11:34 PM	-1.0	-30
19 Th	07:03 AM	11.7	357
	12:46 PM	6.6	201
	05:21 PM	9.5	290
20 F	12:09 AM	-0.7	-21
	07:30 AM	11.8	360
	01:24 PM	6.3	192
	06:04 PM	9.2	280
21 Sa	12:46 AM	-0.3	-9
	08:00 AM	11.8	360
	02:05 PM	5.9	180
	06:50 PM	8.7	265
22 Su	01:23 AM	0.4	12
	08:32 AM	11.8	360
	02:49 PM	5.4	165
	07:42 PM	8.3	253
23 M	02:02 AM	1.3	40
	09:07 AM	11.7	357
	03:37 PM	4.8	146
	08:42 PM	7.8	238
24 Tu	02:43 AM	2.4	73
	09:43 AM	11.6	354
	04:28 PM	4.1	125
	09:54 PM	7.5	229
25 W ◑	03:28 AM	3.7	113
	10:21 AM	11.5	351
	05:20 PM	3.1	94
	11:16 PM	7.5	229
26 Th	04:22 AM	4.9	149
	11:02 AM	11.3	344
	06:12 PM	2.1	64
27 F	12:47 AM	8.0	244
	05:29 AM	6.1	186
	11:44 AM	11.3	344
	07:01 PM	0.9	27
28 Sa	02:11 AM	8.9	271
	06:45 AM	6.9	210
	12:30 PM	11.3	344
	07:49 PM	-0.3	-9
29 Su	03:16 AM	9.9	302
	07:57 AM	7.3	223
	01:17 PM	11.4	347
	08:35 PM	-1.4	-43
30 M	04:06 AM	10.8	329
	09:00 AM	7.4	226
	02:06 PM	11.5	351
	09:21 PM	-2.3	-70
31 Tu	04:49 AM	11.5	351
	09:56 AM	7.2	219
	02:56 PM	11.6	354
	10:07 PM	-2.8	-85

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2014

The NOAA Tide Predictions application provides predictions in both graphical and tabular formats, with many user selected options, for over 3000 stations broken down by key areas in each state. Users can also access stations via the Google map interface. Additional information can be found in the help page.

Station Types: The NOAA Tide Predictions application provides predictions from 2 distinct categories of stations at over 3000 locations:
Harmonic - The predicted height values for Harmonic stations are conducted by combining the harmonic constituents into a single tide curve.
Subordinate - The high and low height values for Subordinate stations are obtained by means and differences, and ratios applied to the full harmonic constant predictions at a specific Harmonic station (a Reference station).

Disclaimer: The official Tide prediction tables are published annually on October 1, for the following calendar year. Tide predictions generated prior to the publishing date of the official tables are subject to change. The predictions from the web based NOAA Tidal Predictions are based upon the latest information available as of the date of your request. Tide predictions generated may differ from the official published predictions if information for the station requested has been updated since the publishing date of the official published tables.

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2014

Times and Heights of High and Low Waters

January

	Time (h m)	Height (ft)	Height (cm)
1 W ●	05:29 AM	12.1	369
	10:50 AM	6.7	204
	03:51 PM	11.6	354
	10:55 PM	-3.0	-91
2 Th	06:10 AM	12.5	381
	11:41 AM	6.2	189
	04:45 PM	11.4	347
	11:41 PM	-2.8	-85
3 F	06:51 AM	12.8	390
	12:34 PM	5.6	171
	05:41 PM	10.9	332
4 Sa	12:28 AM	-2.1	-64
	07:32 AM	12.9	393
	01:29 PM	4.9	149
	06:40 PM	10.3	314
5 Su	01:16 AM	-1.0	-30
	08:14 AM	12.9	393
	02:26 PM	4.2	128
	07:45 PM	9.5	290
6 M	02:04 AM	0.5	15
	08:57 AM	12.7	387
	03:26 PM	3.5	107
	08:58 PM	8.8	268
7 Tu	02:56 AM	2.1	64
	09:41 AM	12.4	378
	04:29 PM	2.7	82
	10:23 PM	8.3	253
8 W ◐	03:53 AM	3.8	116
	10:27 AM	12.0	366
	05:33 PM	2.0	61
9 Th	12:07 AM	8.3	253
	05:01 AM	5.3	162
	11:16 AM	11.6	354
	06:34 PM	1.3	40
10 F	01:51 AM	8.9	271
	06:25 AM	6.4	195
	12:07 PM	11.1	338
	07:29 PM	0.7	21
11 Sa	03:08 AM	9.8	299
	07:52 AM	6.9	210
	12:58 PM	10.7	326
	08:16 PM	0.2	6
12 Su	04:03 AM	10.5	320
	09:02 AM	7.0	213
	01:46 PM	10.5	320
	08:57 PM	-0.2	-6
13 M	04:46 AM	11.0	335
	09:56 AM	6.9	210
	02:32 PM	10.3	314
	09:34 PM	-0.4	-12
14 Tu	05:20 AM	11.3	344
	10:38 AM	6.8	207
	03:13 PM	10.1	308
	10:09 PM	-0.5	-15
15 W	05:47 AM	11.4	347
	11:14 AM	6.6	201
	03:53 PM	10.0	305
	10:42 PM	-0.5	-15
16 Th ○	06:09 AM	11.5	351
	11:45 AM	6.3	192
	04:32 PM	9.9	302
	11:15 PM	-0.4	-12
17 F	06:31 AM	11.6	354
	12:16 PM	5.9	180
	05:12 PM	9.7	296
	11:49 PM	-0.2	-6
18 Sa	06:54 AM	11.7	357
	12:49 PM	5.5	168
	05:53 PM	9.5	290
19 Su	12:24 AM	0.3	9
	07:21 AM	11.8	360
	01:25 PM	4.9	149
	06:37 PM	9.2	280
20 M	12:59 AM	1.0	30
	07:50 AM	11.8	360
	02:04 PM	4.4	134
	07:25 PM	8.9	271
21 Tu	01:35 AM	1.9	58
	08:21 AM	11.8	360
	02:46 PM	3.8	116
	08:20 PM	8.6	262
22 W	02:14 AM	3.0	91
	08:55 AM	11.6	354
	03:34 PM	3.1	94
	09:24 PM	8.2	250
23 Th	02:56 AM	4.2	128
	09:32 AM	11.4	347
	04:26 PM	2.4	73
	10:40 PM	8.1	247
24 F ◑	03:47 AM	5.4	165
	10:14 AM	11.2	341
	05:23 PM	1.6	49
25 Sa	12:10 AM	8.4	256
	04:55 AM	6.5	198
	11:02 AM	11.0	335
	06:22 PM	0.7	21
26 Su	01:45 AM	9.1	277
	06:20 AM	7.2	219
	11:57 AM	11.0	335
	07:19 PM	-0.3	-9
27 M	02:57 AM	9.9	302
	07:42 AM	7.4	226
	12:55 PM	11.1	338
	08:13 PM	-1.1	-34
28 Tu	03:47 AM	10.8	329
	08:49 AM	7.1	216
	01:54 PM	11.2	341
	09:04 PM	-1.8	-55
29 W	04:28 AM	11.5	351
	09:45 AM	6.5	198
	02:52 PM	11.4	347
	09:52 PM	-2.2	-67
30 Th ●	05:05 AM	12.0	366
	10:36 AM	5.8	177
	03:48 PM	11.4	347
	10:39 PM	-2.2	-67
31 F	05:42 AM	12.4	378
	11:25 AM	5.0	152
	04:44 PM	11.3	344
	11:26 PM	-1.8	-55

February

	Time (h m)	Height (ft)	Height (cm)
1 Sa	06:19 AM	12.6	384
	12:13 PM	4.1	125
	05:40 PM	11.0	335
2 Su	12:11 AM	-0.9	-27
	06:56 AM	12.7	387
	01:02 PM	3.3	101
	06:39 PM	10.5	320
3 M	12:57 AM	0.3	9
	07:34 AM	12.7	387
	01:53 PM	2.6	79
	07:40 PM	9.9	302
4 Tu	01:44 AM	1.7	52
	08:14 AM	12.4	378
	02:45 PM	2.1	64
	08:46 PM	9.3	283
5 W	02:33 AM	3.3	101
	08:56 AM	12.0	366
	03:41 PM	1.8	55
	10:04 PM	8.9	271
6 Th ◐	03:28 AM	4.8	146
	09:41 AM	11.4	347
	04:40 PM	1.6	49
	11:41 PM	8.7	265
7 F	04:38 AM	6.1	186
	10:31 AM	10.8	329
	05:43 PM	1.4	43
8 Sa	01:27 AM	9.1	277
	06:11 AM	6.9	210
	11:28 AM	10.2	311
	06:45 PM	1.2	37
9 Su	02:45 AM	9.7	296
	07:47 AM	7.0	213
	12:29 PM	9.8	299
	07:41 PM	0.9	27
10 M	03:39 AM	10.3	314
	08:55 AM	6.7	204
	01:28 PM	9.7	296
	08:29 PM	0.6	18
11 Tu	04:18 AM	10.7	326
	09:43 AM	6.4	195
	02:20 PM	9.7	296
	09:11 PM	0.4	12
12 W	04:47 AM	10.9	332
	10:19 AM	6.0	183
	03:06 PM	9.7	296
	09:48 PM	0.3	9
13 Th	05:10 AM	11.0	335
	10:49 AM	5.6	171
	03:47 PM	9.8	299
	10:22 PM	0.3	9
14 F ○	05:29 AM	11.1	338
	11:15 AM	5.1	155
	04:27 PM	9.9	302
	10:55 PM	0.5	15
15 Sa	05:48 AM	11.2	341
	11:43 AM	4.6	140
	05:06 PM	9.9	302
	11:28 PM	0.8	24
16 Su	06:10 AM	11.4	347
	12:12 PM	4.0	122
	05:46 PM	9.9	302
17 M	12:02 AM	1.3	40
	06:36 AM	11.5	351
	12:46 PM	3.3	101
	06:29 PM	9.8	299
18 Tu	12:37 AM	2.0	61
	07:04 AM	11.5	351
	01:23 PM	2.7	82
	07:15 PM	9.6	293
19 W	01:13 AM	2.8	85
	07:34 AM	11.4	347
	02:04 PM	2.1	64
	08:07 PM	9.4	287
20 Th	01:52 AM	3.9	119
	08:07 AM	11.3	344
	02:49 PM	1.6	49
	09:06 PM	9.1	277
21 F	02:36 AM	4.9	149
	08:45 AM	11.0	335
	03:41 PM	1.2	37
	10:16 PM	8.9	271
22 Sa ◑	03:30 AM	6.0	183
	09:29 AM	10.7	326
	04:39 PM	0.8	24
	11:41 PM	9.0	274
23 Su	04:42 AM	6.8	207
	10:25 AM	10.4	317
	05:43 PM	0.4	12
24 M	01:13 AM	9.4	287
	06:13 AM	7.1	216
	11:33 AM	10.2	311
	06:48 PM	-0.1	-3
25 Tu	02:25 AM	10.1	308
	07:38 AM	6.8	207
	12:44 PM	10.3	314
	07:49 PM	-0.6	-18
26 W	03:14 AM	10.7	326
	08:42 AM	6.1	186
	01:51 PM	10.5	320
	08:44 PM	-0.9	-27
27 Th	03:54 AM	11.3	344
	09:33 AM	5.1	155
	02:53 PM	10.8	329
	09:35 PM	-1.0	-30
28 F	04:29 AM	11.7	357
	10:20 AM	4.1	125
	03:52 PM	11.0	335
	10:23 PM	-0.7	-21

March

	Time (h m)	Height (ft)	Height (cm)
1 Sa ●	05:04 AM	12.0	366
	11:04 AM	3.0	91
	04:47 PM	11.1	338
	11:09 PM	-0.1	-3
2 Su	05:38 AM	12.2	372
	11:48 AM	2.1	64
	05:42 PM	11.0	335
	11:54 PM	0.8	24
3 M	06:14 AM	12.2	372
	12:33 PM	1.4	43
	06:37 PM	10.8	329
4 Tu	12:40 AM	2.0	61
	06:50 AM	12.0	366
	01:18 PM	1.0	30
	07:34 PM	10.4	317
5 W	01:26 AM	3.2	98
	07:29 AM	11.6	354
	02:04 PM	0.8	24
	08:33 PM	10.0	305
6 Th	02:15 AM	4.4	134
	08:10 AM	11.0	335
	02:53 PM	0.9	27
	09:40 PM	9.5	290
7 F	03:12 AM	5.5	168
	08:55 AM	10.3	314
	03:46 PM	1.1	34
	11:01 PM	9.3	283
8 Sa ◐	04:24 AM	6.3	192
	09:48 AM	9.6	293
	04:45 PM	1.4	43
9 Su	12:36 AM	9.3	283
	07:03 AM	6.7	204
	11:50 AM	9.1	277
	06:50 PM	1.6	49
10 M	02:55 AM	9.6	293
	08:35 AM	6.4	195
	01:01 PM	8.7	265
	07:54 PM	1.7	52
11 Tu	03:49 AM	9.9	302
	09:35 AM	5.9	180
	02:10 PM	8.7	265
	08:51 PM	1.6	49
12 W	04:26 AM	10.2	311
	10:17 AM	5.4	165
	03:09 PM	8.9	271
	09:39 PM	1.5	46
13 Th	04:53 AM	10.3	314
	10:48 AM	4.8	146
	03:58 PM	9.2	280
	10:19 PM	1.4	43
14 F	05:14 AM	10.5	320
	11:14 AM	4.2	128
	04:41 PM	9.5	290
	10:56 PM	1.5	46
15 Sa	05:34 AM	10.6	323
	11:39 AM	3.5	107
	05:22 PM	9.8	299
	11:30 PM	1.8	55
16 Su ○	05:55 AM	10.8	329
	12:06 PM	2.8	85
	06:01 PM	10.0	305
17 M	12:05 AM	2.2	67
	06:20 AM	10.9	332
	12:36 PM	2.0	61
	06:41 PM	10.2	311
18 Tu	12:40 AM	2.7	82
	06:47 AM	11.0	335
	01:10 PM	1.3	40
	07:24 PM	10.3	314
19 W	01:18 AM	3.3	101
	07:16 AM	11.0	335
	01:47 PM	0.7	21
	08:10 PM	10.3	314
20 Th	01:57 AM	4.1	125
	07:48 AM	10.9	332
	02:29 PM	0.2	6
	09:00 PM	10.2	311
21 F	02:40 AM	4.9	149
	08:24 AM	10.6	323
	03:14 PM	0.0	0
	09:56 PM	10.0	305
22 Sa	03:30 AM	5.6	171
	09:06 AM	10.3	314
	04:06 PM	0.0	0
	11:02 PM	9.8	299
23 Su	04:31 AM	6.3	192
	09:57 AM	9.9	302
	05:05 PM	0.1	3
24 M ◑	12:18 AM	9.7	296
	05:50 AM	6.6	201
	11:04 AM	9.4	287
	06:11 PM	0.2	6
25 Tu	01:36 AM	9.9	302
	07:20 AM	6.3	192
	12:24 PM	9.2	280
	07:19 PM	0.3	9
26 W	02:41 AM	10.3	314
	08:35 AM	5.5	168
	01:44 PM	9.3	283
	08:24 PM	0.4	12
27 Th	03:30 AM	10.8	329
	09:32 AM	4.4	134
	02:57 PM	9.6	293
	09:23 PM	0.5	15
28 F	04:10 AM	11.2	341
	10:19 AM	3.2	98
	04:02 PM	10.1	308
	10:17 PM	0.8	24
29 Sa	04:46 AM	11.4	347
	11:01 AM	2.0	61
	05:00 PM	10.5	320
	11:06 PM	1.3	40
30 Su ●	05:20 AM	11.6	354
	11:42 AM	1.0	30
	05:54 PM	10.8	329
	11:52 PM	2.0	61
31 M	05:54 AM	11.6	354
	12:22 PM	0.2	6
	06:46 PM	10.9	332

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2014

Times and Heights of High and Low Waters

April

	Time (h m)	Height (ft)	Height (cm)
1 Tu	12:38 AM	2.9	88
	06:29 AM	11.5	351
	01:02 PM	-0.3	-9
	07:37 PM	10.9	332
2 W	01:25 AM	3.7	113
	07:06 AM	11.1	338
	01:43 PM	-0.5	-15
	08:28 PM	10.8	329
3 Th	02:12 AM	4.6	140
	07:44 AM	10.6	323
	02:25 PM	-0.4	-12
	09:20 PM	10.5	320
4 F	03:03 AM	5.3	162
	08:26 AM	10.0	305
	03:09 PM	0.0	0
	10:16 PM	10.2	311
5 Sa	04:02 AM	5.9	180
	09:12 AM	9.3	283
	03:57 PM	0.6	18
	11:19 PM	9.9	302
6 Su	05:15 AM	6.2	189
	10:07 AM	8.6	262
	04:50 PM	1.2	37
7 M ◐	12:28 AM	9.7	296
	06:46 AM	6.1	186
	11:13 AM	8.0	244
	05:50 PM	1.8	55
8 Tu	01:36 AM	9.7	296
	08:07 AM	5.7	174
	12:30 PM	7.7	235
	06:55 PM	2.2	67
9 W	02:31 AM	9.8	299
	09:01 AM	5.0	152
	01:46 PM	7.8	238
	07:59 PM	2.4	73
10 Th	03:10 AM	9.9	302
	09:39 AM	4.2	128
	02:52 PM	8.2	250
	08:54 PM	2.6	79
11 F	03:41 AM	10.1	308
	10:08 AM	3.5	107
	03:47 PM	8.6	262
	09:41 PM	2.8	85
12 Sa	04:07 AM	10.2	311
	10:34 AM	2.6	79
	04:33 PM	9.2	280
	10:23 PM	3.1	94
13 Su	04:32 AM	10.4	317
	11:01 AM	1.7	52
	05:16 PM	9.7	296
	11:02 PM	3.4	104
14 M	04:59 AM	10.5	320
	11:30 AM	0.9	27
	05:56 PM	10.1	308
	11:40 PM	3.8	116
15 Tu ○	05:27 AM	10.6	323
	12:03 PM	0.0	0
	06:38 PM	10.5	320
16 W	12:20 AM	4.3	131
	05:57 AM	10.7	326
	12:39 PM	-0.7	-21
	07:21 PM	10.8	329
17 Th	01:01 AM	4.8	146
	06:31 AM	10.6	323
	01:18 PM	-1.2	-37
	08:07 PM	10.9	332
18 F	01:46 AM	5.3	162
	07:07 AM	10.4	317
	02:01 PM	-1.4	-43
	08:57 PM	11.0	335
19 Sa	02:35 AM	5.7	174
	07:49 AM	10.1	308
	02:48 PM	-1.3	-40
	09:51 PM	10.8	329
20 Su	03:31 AM	6.0	183
	08:39 AM	9.7	296
	03:40 PM	-1.0	-30
	10:51 PM	10.7	326
21 M	04:39 AM	6.1	186
	09:40 AM	9.1	277
	04:38 PM	-0.4	-12
	11:55 PM	10.6	323
22 Tu ◑	05:58 AM	5.8	177
	10:57 AM	8.5	259
	05:41 PM	0.3	9
23 W	12:58 AM	10.7	326
	07:19 AM	5.0	152
	12:24 PM	8.3	253
	06:50 PM	1.0	30
24 Th	01:54 AM	10.8	329
	08:24 AM	3.8	116
	01:51 PM	8.4	256
	07:57 PM	1.7	52
25 F	02:42 AM	11.0	335
	09:16 AM	2.5	76
	03:09 PM	9.0	274
	09:00 PM	2.3	70
26 Sa	03:23 AM	11.2	341
	10:01 AM	1.3	40
	04:16 PM	9.6	293
	09:57 PM	2.9	88
27 Su	04:00 AM	11.3	344
	10:41 AM	0.2	6
	05:14 PM	10.2	311
	10:49 PM	3.5	107
28 M	04:36 AM	11.3	344
	11:19 AM	-0.6	-18
	06:06 PM	10.7	326
	11:38 PM	4.1	125
29 Tu ●	05:11 AM	11.1	338
	11:57 AM	-1.2	-37
	06:53 PM	11.0	335
30 W	12:26 AM	4.7	143
	05:47 AM	10.8	329
	12:34 PM	-1.4	-43
	07:39 PM	11.1	338

May

	Time (h m)	Height (ft)	Height (cm)
1 Th	01:14 AM	5.2	158
	06:25 AM	10.3	314
	01:12 PM	-1.4	-43
	08:22 PM	11.1	338
2 F	02:02 AM	5.6	171
	07:04 AM	9.8	299
	01:51 PM	-1.1	-34
	09:06 PM	11.0	335
3 Sa	02:54 AM	5.9	180
	07:47 AM	9.2	280
	02:32 PM	-0.6	-18
	09:52 PM	10.8	329
4 Su	03:50 AM	6.0	183
	08:34 AM	8.6	262
	03:16 PM	0.1	3
	10:39 PM	10.5	320
5 M	04:55 AM	5.9	180
	09:29 AM	7.9	241
	04:03 PM	0.8	24
	11:29 PM	10.3	314
6 Tu	06:09 AM	5.6	171
	10:35 AM	7.4	226
	04:55 PM	1.7	52
7 W ◐	12:20 AM	10.2	311
	07:18 AM	5.0	152
	11:52 AM	7.1	216
	05:54 PM	2.5	76
8 Th	01:08 AM	10.1	308
	08:10 AM	4.2	128
	01:12 PM	7.2	219
	06:56 PM	3.2	98
9 F	01:50 AM	10.2	311
	08:49 AM	3.3	101
	02:27 PM	7.6	232
	07:57 PM	3.7	113
10 Sa	02:27 AM	10.2	311
	09:21 AM	2.3	70
	03:30 PM	8.2	250
	08:54 PM	4.2	128
11 Su	03:01 AM	10.3	314
	09:52 AM	1.3	40
	04:23 PM	8.9	271
	09:44 PM	4.6	140
12 M	03:33 AM	10.5	320
	10:23 AM	0.3	9
	05:08 PM	9.6	293
	10:30 PM	5.0	152
13 Tu	04:05 AM	10.6	323
	10:56 AM	-0.7	-21
	05:51 PM	10.3	314
	11:15 PM	5.4	165
14 W ○	04:38 AM	10.6	323
	11:33 AM	-1.5	-46
	06:34 PM	10.8	329
15 Th	12:00 AM	5.7	174
	05:14 AM	10.6	323
	12:12 PM	-2.2	-67
	07:18 PM	11.2	341
16 F	12:47 AM	5.9	180
	05:53 AM	10.5	320
	12:55 PM	-2.5	-76
	08:03 PM	11.5	351
17 Sa	01:36 AM	6.0	183
	06:38 AM	10.3	314
	01:40 PM	-2.5	-76
	08:51 PM	11.6	354
18 Su	02:31 AM	6.0	183
	07:28 AM	9.9	302
	02:28 PM	-2.1	-64
	09:42 PM	11.6	354
19 M	03:31 AM	5.8	177
	08:26 AM	9.3	283
	03:19 PM	-1.4	-43
	10:34 PM	11.5	351
20 Tu	04:38 AM	5.4	165
	09:34 AM	8.6	262
	04:14 PM	-0.4	-12
	11:27 PM	11.5	351
21 W ◑	05:51 AM	4.6	140
	10:55 AM	8.0	244
	05:14 PM	0.8	24
22 Th	12:19 AM	11.4	347
	07:02 AM	3.6	110
	12:26 PM	7.8	238
	06:20 PM	2.1	64
23 F	01:09 AM	11.4	347
	08:03 AM	2.3	70
	02:00 PM	8.0	244
	07:29 PM	3.2	98
24 Sa	01:56 AM	11.3	344
	08:55 AM	1.1	34
	03:24 PM	8.7	265
	08:38 PM	4.1	125
25 Su	02:39 AM	11.3	344
	09:40 AM	0.0	0
	04:33 PM	9.5	290
	09:41 PM	4.8	146
26 M	03:19 AM	11.1	338
	10:20 AM	-0.9	-27
	05:29 PM	10.2	311
	10:38 PM	5.3	162
27 Tu	03:58 AM	10.9	332
	10:57 AM	-1.4	-43
	06:17 PM	10.7	326
	11:30 PM	5.7	174
28 W ●	04:35 AM	10.6	323
	11:34 AM	-1.7	-52
	06:59 PM	11.0	335
29 Th	12:19 AM	6.0	183
	05:13 AM	10.3	314
	12:10 PM	-1.8	-55
	07:38 PM	11.2	341
30 F	01:05 AM	6.1	186
	05:52 AM	9.8	299
	12:46 PM	-1.6	-49
	08:13 PM	11.2	341
31 Sa	01:51 AM	6.1	186
	06:33 AM	9.4	287
	01:24 PM	-1.3	-40
	08:48 PM	11.2	341

June

	Time (h m)	Height (ft)	Height (cm)
1 Su	02:38 AM	6.0	183
	07:16 AM	8.9	271
	02:02 PM	-0.8	-24
	09:24 PM	11.1	338
2 M	03:27 AM	5.8	177
	08:04 AM	8.4	256
	02:42 PM	-0.2	-6
	10:01 PM	11.0	335
3 Tu	04:19 AM	5.5	168
	08:58 AM	7.8	238
	03:25 PM	0.7	21
	10:40 PM	10.9	332
4 W	05:15 AM	5.0	152
	09:59 AM	7.3	223
	04:09 PM	1.6	49
	11:21 PM	10.8	329
5 Th ◐	06:11 AM	4.4	134
	11:11 AM	7.0	213
	04:59 PM	2.7	82
6 F	12:02 AM	10.7	326
	07:04 AM	3.6	110
	12:31 PM	6.9	210
	05:55 PM	3.7	113
7 Sa	12:43 AM	10.6	323
	07:50 AM	2.6	79
	01:53 PM	7.3	223
	06:57 PM	4.7	143
8 Su	01:23 AM	10.5	320
	08:30 AM	1.5	46
	03:08 PM	8.0	244
	08:02 PM	5.4	165
9 M	02:02 AM	10.6	323
	09:09 AM	0.4	12
	04:09 PM	8.9	271
	09:04 PM	5.9	180
10 Tu	02:40 AM	10.6	323
	09:47 AM	-0.7	-21
	04:59 PM	9.7	296
	10:00 PM	6.3	192
11 W	03:19 AM	10.7	326
	10:27 AM	-1.7	-52
	05:44 PM	10.4	317
	10:52 PM	6.4	195
12 Th	03:59 AM	10.8	329
	11:08 AM	-2.5	-76
	06:26 PM	11.0	335
	11:42 PM	6.4	195
13 F ○	04:43 AM	10.8	329
	11:51 AM	-3.0	-91
	07:09 PM	11.5	351
14 Sa	12:32 AM	6.3	192
	05:30 AM	10.7	326
	12:36 PM	-3.1	-94
	07:52 PM	11.8	360
15 Su	01:24 AM	6.0	183
	06:22 AM	10.4	317
	01:22 PM	-2.9	-88
	08:36 PM	12.0	366
16 M	02:19 AM	5.6	171
	07:18 AM	9.9	302
	02:10 PM	-2.2	-67
	09:20 PM	12.1	369
17 Tu	03:18 AM	5.0	152
	08:21 AM	9.3	283
	03:00 PM	-1.2	-37
	10:06 PM	12.1	369
18 W	04:20 AM	4.2	128
	09:31 AM	8.5	259
	03:52 PM	0.2	6
	10:52 PM	12.0	366
19 Th ◑	05:26 AM	3.3	101
	10:52 AM	7.9	241
	04:49 PM	1.7	52
	11:39 PM	11.8	360
20 F	06:32 AM	2.3	70
	12:25 PM	7.7	235
	05:52 PM	3.3	101
21 Sa	12:27 AM	11.6	354
	07:34 AM	1.3	40
	02:06 PM	8.0	244
	07:05 PM	4.6	140
22 Su	01:15 AM	11.3	344
	08:28 AM	0.3	9
	03:35 PM	8.8	268
	08:21 PM	5.5	168
23 M	02:02 AM	11.1	338
	09:16 AM	-0.5	-15
	04:42 PM	9.7	296
	09:33 PM	6.1	186
24 Tu	02:47 AM	10.8	329
	09:58 AM	-1.1	-34
	05:35 PM	10.3	314
	10:34 PM	6.3	192
25 W	03:30 AM	10.5	320
	10:37 AM	-1.4	-43
	06:18 PM	10.8	329
	11:26 PM	6.4	195
26 Th	04:11 AM	10.2	311
	11:14 AM	-1.5	-46
	06:55 PM	11.0	335
27 F ●	12:12 AM	6.3	192
	04:52 AM	9.9	302
	11:49 AM	-1.5	-46
	07:26 PM	11.1	338
28 Sa	12:53 AM	6.2	189
	05:32 AM	9.6	293
	12:24 PM	-1.3	-40
	07:53 PM	11.1	338
29 Su	01:32 AM	6.0	183
	06:13 AM	9.3	283
	01:00 PM	-1.0	-30
	08:20 PM	11.2	341
30 M	02:10 AM	5.7	174
	06:57 AM	8.9	271
	01:36 PM	-0.6	-18
	08:48 PM	11.2	341

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2014

Times and Heights of High and Low Waters

July

	Time (h m)	Height (ft)	Height (cm)
1 Tu	02:50 AM	5.3	162
	07:43 AM	8.5	259
	02:14 PM	0.1	3
	09:19 PM	11.2	341
2 W	03:32 AM	4.8	146
	08:33 AM	8.1	247
	02:52 PM	0.9	27
	09:53 PM	11.2	341
3 Th	04:17 AM	4.3	131
	09:29 AM	7.7	235
	03:32 PM	1.9	58
	10:28 PM	11.1	338
4 F	05:06 AM	3.6	110
	10:34 AM	7.3	223
	04:15 PM	3.1	94
	11:06 PM	10.9	332
5 Sa ◐	05:57 AM	2.9	88
	11:49 AM	7.2	219
	05:04 PM	4.3	131
	11:46 PM	10.7	326
6 Su	06:49 AM	2.0	61
	01:13 PM	7.5	229
	06:05 PM	5.4	165
7 M	12:28 AM	10.6	323
	07:39 AM	1.0	30
	02:39 PM	8.1	247
	07:17 PM	6.2	189
8 Tu	01:12 AM	10.6	323
	08:28 AM	0.0	0
	03:50 PM	8.9	271
	08:30 PM	6.7	204
9 W	01:59 AM	10.6	323
	09:15 AM	-1.1	-34
	04:44 PM	9.8	299
	09:35 PM	6.8	207
10 Th	02:47 AM	10.7	326
	10:01 AM	-2.0	-61
	05:27 PM	10.5	320
	10:32 PM	6.7	204
11 F	03:36 AM	10.9	332
	10:46 AM	-2.6	-79
	06:08 PM	11.1	338
	11:24 PM	6.3	192
12 Sa ○	04:27 AM	11.0	335
	11:32 AM	-3.0	-91
	06:47 PM	11.6	354
13 Su	12:14 AM	5.8	177
	05:21 AM	10.9	332
	12:19 PM	-2.9	-88
	07:26 PM	11.9	363
14 M	01:06 AM	5.1	155
	06:16 AM	10.6	323
	01:06 PM	-2.4	-73
	08:06 PM	12.1	369
15 Tu	01:58 AM	4.4	134
	07:15 AM	10.1	308
	01:53 PM	-1.5	-46
	08:47 PM	12.2	372

	Time (h m)	Height (ft)	Height (cm)
16 W	02:53 AM	3.6	110
	08:18 AM	9.5	290
	02:41 PM	-0.3	-9
	09:29 PM	12.2	372
17 Th	03:50 AM	2.8	85
	09:27 AM	8.9	271
	03:31 PM	1.3	40
	10:12 PM	12.0	366
18 F	04:50 AM	2.1	64
	10:46 AM	8.3	253
	04:26 PM	2.9	88
	10:58 PM	11.7	357
19 Sa ◑	05:53 AM	1.4	43
	12:19 PM	8.1	247
	05:30 PM	4.4	134
	11:47 PM	11.2	341
20 Su	06:55 AM	0.8	24
	02:03 PM	8.4	256
	06:49 PM	5.6	171
21 M	12:39 AM	10.8	329
	07:55 AM	0.2	6
	03:31 PM	9.1	277
	08:16 PM	6.3	192
22 Tu	01:33 AM	10.4	317
	08:49 AM	-0.2	-6
	04:35 PM	9.8	299
	09:33 PM	6.4	195
23 W	02:26 AM	10.1	308
	09:36 AM	-0.6	-18
	05:23 PM	10.4	317
	10:32 PM	6.3	192
24 Th	03:15 AM	9.9	302
	10:17 AM	-0.8	-24
	06:01 PM	10.7	326
	11:19 PM	6.1	186
25 F	04:00 AM	9.7	296
	10:55 AM	-0.8	-24
	06:31 PM	10.8	329
	11:57 PM	5.8	177
26 Sa ●	04:42 AM	9.6	293
	11:30 AM	-0.8	-24
	06:56 PM	10.8	329
27 Su	12:30 AM	5.6	171
	05:23 AM	9.5	290
	12:04 PM	-0.6	-18
	07:17 PM	10.9	332
28 M	01:01 AM	5.2	158
	06:03 AM	9.4	287
	12:38 PM	-0.3	-9
	07:39 PM	10.9	332
29 Tu	01:33 AM	4.7	143
	06:44 AM	9.2	280
	01:12 PM	0.2	6
	08:04 PM	11.0	335
30 W	02:07 AM	4.2	128
	07:28 AM	8.9	271
	01:47 PM	0.8	24
	08:33 PM	11.1	338
31 Th	02:45 AM	3.7	113
	08:15 AM	8.7	265
	02:23 PM	1.7	52
	09:04 PM	11.0	335

August

	Time (h m)	Height (ft)	Height (cm)
1 F	03:25 AM	3.1	94
	09:07 AM	8.4	256
	03:01 PM	2.7	82
	09:37 PM	10.9	332
2 Sa	04:10 AM	2.6	79
	10:05 AM	8.1	247
	03:42 PM	3.8	116
	10:13 PM	10.7	326
3 Su	05:00 AM	2.0	61
	11:14 AM	7.9	241
	04:30 PM	4.9	149
	10:53 PM	10.4	317
4 M ◐	05:54 AM	1.4	43
	12:35 PM	8.0	244
	05:32 PM	5.9	180
	11:39 PM	10.2	311
5 Tu	06:52 AM	0.7	21
	02:04 PM	8.5	259
	06:51 PM	6.6	201
6 W	12:33 AM	10.2	311
	07:50 AM	-0.1	-3
	03:21 PM	9.2	280
	08:12 PM	6.8	207
7 Th	01:31 AM	10.2	311
	08:45 AM	-0.9	-27
	04:15 PM	9.9	302
	09:21 PM	6.6	201
8 F	02:30 AM	10.4	317
	09:37 AM	-1.6	-49
	04:58 PM	10.5	320
	10:17 PM	6.0	183
9 Sa	03:27 AM	10.7	326
	10:27 AM	-2.1	-64
	05:36 PM	11.1	338
	11:07 PM	5.3	162
10 Su ○	04:24 AM	10.9	332
	11:15 AM	-2.2	-67
	06:12 PM	11.5	351
	11:55 PM	4.4	134
11 M	05:20 AM	10.9	332
	12:01 PM	-1.9	-58
	06:49 PM	11.8	360
12 Tu	12:43 AM	3.5	107
	06:16 AM	10.8	329
	12:48 PM	-1.2	-37
	07:27 PM	12.0	366
13 W	01:31 AM	2.6	79
	07:14 AM	10.5	320
	01:35 PM	-0.1	-3
	08:06 PM	12.0	366
14 Th	02:22 AM	1.9	58
	08:15 AM	10.0	305
	02:22 PM	1.2	37
	08:46 PM	11.8	360
15 F	03:14 AM	1.3	40
	09:21 AM	9.4	287
	03:13 PM	2.7	82
	09:29 PM	11.5	351

	Time (h m)	Height (ft)	Height (cm)
16 Sa	04:08 AM	1.0	30
	10:35 AM	9.0	274
	04:09 PM	4.1	125
	10:16 PM	11.0	335
17 Su ◑	05:07 AM	0.8	24
	12:03 PM	8.7	265
	05:17 PM	5.3	162
	11:08 PM	10.4	317
18 M	06:10 AM	0.8	24
	01:43 PM	8.9	271
	06:45 PM	6.1	186
19 Tu	12:07 AM	9.8	299
	07:14 AM	0.7	21
	03:07 PM	9.4	287
	08:19 PM	6.2	189
20 W	01:11 AM	9.4	287
	08:16 AM	0.5	15
	04:06 PM	9.9	302
	09:30 PM	6.0	183
21 Th	02:13 AM	9.2	280
	09:09 AM	0.4	12
	04:50 PM	10.2	311
	10:21 PM	5.6	171
22 F	03:09 AM	9.2	280
	09:54 AM	0.3	9
	05:23 PM	10.4	317
	11:00 PM	5.2	158
23 Sa	03:57 AM	9.3	283
	10:33 AM	0.2	6
	05:48 PM	10.4	317
	11:31 PM	4.7	143
24 Su	04:39 AM	9.4	287
	11:09 AM	0.3	9
	06:08 PM	10.5	320
	11:58 PM	4.3	131
25 M ●	05:18 AM	9.5	290
	11:42 AM	0.6	18
	06:27 PM	10.5	320
26 Tu	12:25 AM	3.8	116
	05:57 AM	9.6	293
	12:15 PM	0.9	27
	06:49 PM	10.6	323
27 W	12:54 AM	3.2	98
	06:36 AM	9.6	293
	12:49 PM	1.4	43
	07:14 PM	10.7	326
28 Th	01:26 AM	2.6	79
	07:18 AM	9.5	290
	01:23 PM	2.1	64
	07:42 PM	10.7	326
29 F	02:01 AM	2.1	64
	08:02 AM	9.4	287
	02:00 PM	2.9	88
	08:13 PM	10.6	323
30 Sa	02:40 AM	1.6	49
	08:51 AM	9.2	280
	02:38 PM	3.8	116
	08:45 PM	10.4	317
31 Su	03:23 AM	1.2	37
	09:46 AM	9.0	274
	03:22 PM	4.7	143
	09:22 PM	10.1	308

September

	Time (h m)	Height (ft)	Height (cm)
1 M	04:12 AM	0.9	27
	10:50 AM	8.9	271
	04:13 PM	5.6	171
	10:05 PM	9.8	299
2 Tu ◐	05:08 AM	0.7	21
	12:06 PM	8.8	268
	05:21 PM	6.3	192
	11:00 PM	9.6	293
3 W	06:10 AM	0.4	12
	01:29 PM	9.1	277
	06:46 PM	6.6	201
4 Th	12:07 AM	9.4	287
	07:15 AM	0.0	0
	02:42 PM	9.6	293
	08:08 PM	6.3	192
5 F	01:18 AM	9.5	290
	08:18 AM	-0.4	-12
	03:35 PM	10.1	308
	09:12 PM	5.6	171
6 Sa	02:26 AM	9.9	302
	09:15 AM	-0.7	-21
	04:17 PM	10.7	326
	10:03 PM	4.6	140
7 Su	03:29 AM	10.3	314
	10:07 AM	-0.8	-24
	04:54 PM	11.1	338
	10:49 PM	3.5	107
8 M	04:27 AM	10.7	326
	10:56 AM	-0.6	-18
	05:30 PM	11.5	351
	11:34 PM	2.4	73
9 Tu ○	05:23 AM	10.9	332
	11:43 AM	-0.1	-3
	06:05 PM	11.7	357
10 W	12:18 AM	1.4	43
	06:19 AM	10.9	332
	12:30 PM	0.8	24
	06:42 PM	11.7	357
11 Th	01:03 AM	0.6	18
	07:15 AM	10.8	329
	01:17 PM	1.8	55
	07:20 PM	11.6	354
12 F	01:49 AM	0.1	3
	08:12 AM	10.6	323
	02:06 PM	3.0	91
	08:01 PM	11.2	341
13 Sa	02:36 AM	-0.1	-3
	09:13 AM	10.2	311
	02:58 PM	4.1	125
	08:44 PM	10.7	326
14 Su	03:26 AM	0.1	3
	10:19 AM	9.8	299
	03:57 PM	5.1	155
	09:32 PM	10.0	305
15 M	04:19 AM	0.4	12
	11:36 AM	9.5	290
	05:12 PM	5.8	177
	10:28 PM	9.3	283

	Time (h m)	Height (ft)	Height (cm)
16 Tu ◑	05:19 AM	0.9	27
	01:03 PM	9.5	290
	06:47 PM	6.1	186
	11:35 PM	8.7	265
17 W	06:25 AM	1.2	37
	02:20 PM	9.6	293
	08:15 PM	5.8	177
18 Th	12:49 AM	8.4	256
	07:32 AM	1.5	46
	03:17 PM	9.9	302
	09:15 PM	5.2	158
19 F	02:01 AM	8.4	256
	08:32 AM	1.5	46
	03:58 PM	10.0	305
	09:58 PM	4.6	140
20 Sa	03:02 AM	8.6	262
	09:23 AM	1.5	46
	04:27 PM	10.1	308
	10:31 PM	4.0	122
21 Su	03:52 AM	9.0	274
	10:05 AM	1.6	49
	04:50 PM	10.2	311
	10:58 PM	3.4	104
22 M	04:35 AM	9.3	283
	10:42 AM	1.8	55
	05:10 PM	10.3	314
	11:23 PM	2.8	85
23 Tu	05:15 AM	9.6	293
	11:17 AM	2.2	67
	05:32 PM	10.4	317
	11:49 PM	2.1	64
24 W ●	05:52 AM	9.8	299
	11:51 AM	2.6	79
	05:56 PM	10.4	317
25 Th	12:17 AM	1.5	46
	06:31 AM	10.0	305
	12:26 PM	3.1	94
	06:22 PM	10.5	320
26 F	12:49 AM	0.9	27
	07:11 AM	10.2	311
	01:02 PM	3.7	113
	06:51 PM	10.4	317
27 Sa	01:24 AM	0.4	12
	07:54 AM	10.2	311
	01:41 PM	4.3	131
	07:22 PM	10.2	311
28 Su	02:03 AM	0.0	0
	08:41 AM	10.2	311
	02:23 PM	5.0	152
	07:57 PM	10.0	305
29 M	02:47 AM	-0.1	-3
	09:34 AM	10.1	308
	03:12 PM	5.6	171
	08:37 PM	9.7	296
30 Tu	03:36 AM	-0.1	-3
	10:34 AM	9.9	302
	04:10 PM	6.1	186
	09:26 PM	9.3	283

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

StationId:9447029
Source:NOAA/NOS/CO-OPS
Station Type:Subordinate
Time Zone:LST/LDT
Datum:mean lower low water (MLLW) which is the chart datum of soundings

NOAA Tide Predictions

Duwamish Waterway, Eighth Ave. South,Washington,2014

Times and Heights of High and Low Waters

October

Day	Time (h m)	Height (ft)	Height (cm)
1 W ◐	04:32 AM	0.1	3
	11:43 AM	9.8	299
	05:25 PM	6.3	192
	10:32 PM	8.9	271
2 Th	05:35 AM	0.3	9
	12:55 PM	9.9	302
	06:50 PM	6.1	186
	11:53 PM	8.7	265
3 F	06:43 AM	0.5	15
	01:59 PM	10.2	311
	08:05 PM	5.3	162
4 Sa	01:15 AM	8.8	268
	07:49 AM	0.6	18
	02:50 PM	10.6	323
	09:02 PM	4.1	125
5 Su	02:30 AM	9.2	280
	08:51 AM	0.8	24
	03:32 PM	11.0	335
	09:49 PM	2.8	85
6 M	03:36 AM	9.8	299
	09:46 AM	1.1	34
	04:09 PM	11.3	344
	10:32 PM	1.5	46
7 Tu	04:36 AM	10.4	317
	10:37 AM	1.6	49
	04:45 PM	11.5	351
	11:13 PM	0.4	12
8 W ○	05:31 AM	10.9	332
	11:26 AM	2.3	70
	05:21 PM	11.6	354
	11:54 PM	-0.5	-15
9 Th	06:24 AM	11.1	338
	12:14 PM	3.1	94
	05:58 PM	11.4	347
10 F	12:35 AM	-1.0	-30
	07:17 AM	11.2	341
	01:02 PM	3.9	119
	06:37 PM	11.1	338
11 Sa	01:18 AM	-1.2	-37
	08:09 AM	11.1	338
	01:53 PM	4.7	143
	07:17 PM	10.6	323
12 Su	02:01 AM	-1.0	-30
	09:03 AM	10.9	332
	02:47 PM	5.3	162
	08:01 PM	9.9	302
13 M	02:46 AM	-0.6	-18
	10:00 AM	10.6	323
	03:49 PM	5.8	177
	08:50 PM	9.2	280
14 Tu	03:35 AM	0.1	3
	11:02 AM	10.3	314
	05:05 PM	6.0	183
	09:48 PM	8.4	256
15 W ◑	04:29 AM	0.9	27
	12:09 PM	10.1	308
	06:36 PM	5.8	177
	10:59 PM	7.8	238
16 Th	05:29 AM	1.7	52
	01:13 PM	10.0	305
	07:52 PM	5.3	162
17 F	12:20 AM	7.5	229
	06:35 AM	2.3	70
	02:06 PM	10.1	308
	08:46 PM	4.5	137
18 Sa	01:40 AM	7.7	235
	07:40 AM	2.7	82
	02:47 PM	10.1	308
	09:25 PM	3.7	113
19 Su	02:49 AM	8.1	247
	08:38 AM	3.0	91
	03:18 PM	10.2	311
	09:55 PM	2.9	88
20 M	03:44 AM	8.6	262
	09:27 AM	3.3	101
	03:45 PM	10.3	314
	10:21 PM	2.1	64
21 Tu	04:30 AM	9.2	280
	10:10 AM	3.6	110
	04:11 PM	10.4	317
	10:47 PM	1.4	43
22 W	05:11 AM	9.7	296
	10:49 AM	4.0	122
	04:37 PM	10.5	320
	11:14 PM	0.6	18
23 Th ●	05:49 AM	10.2	311
	11:26 AM	4.4	134
	05:04 PM	10.5	320
	11:44 PM	-0.1	-3
24 F	06:27 AM	10.6	323
	12:04 PM	4.9	149
	05:33 PM	10.5	320
25 Sa	12:17 AM	-0.7	-21
	07:06 AM	10.9	332
	12:44 PM	5.3	162
	06:04 PM	10.4	317
26 Su	12:55 AM	-1.1	-34
	07:49 AM	11.1	338
	01:27 PM	5.7	174
	06:39 PM	10.2	311
27 M	01:35 AM	-1.3	-40
	08:35 AM	11.1	338
	02:14 PM	6.0	183
	07:18 PM	9.9	302
28 Tu	02:20 AM	-1.3	-40
	09:25 AM	11.1	338
	03:08 PM	6.2	189
	08:05 PM	9.5	290
29 W	03:09 AM	-0.9	-27
	10:20 AM	11.0	335
	04:12 PM	6.3	192
	09:03 PM	8.9	271
30 Th	04:03 AM	-0.3	-9
	11:20 AM	10.9	332
	05:27 PM	5.9	180
	10:19 PM	8.4	256
31 F ◐	05:04 AM	0.5	15
	12:19 PM	10.9	332
	06:45 PM	5.2	158
	11:47 PM	8.1	247

November

Day	Time (h m)	Height (ft)	Height (cm)
1 Sa	06:11 AM	1.3	40
	01:15 PM	11.1	338
	07:52 PM	4.0	122
2 Su	01:17 AM	8.2	250
	06:19 AM	2.0	61
	01:04 PM	11.3	344
	07:46 PM	2.6	79
3 M	01:40 AM	8.8	268
	07:25 AM	2.7	82
	01:47 PM	11.5	351
	08:31 PM	1.2	37
4 Tu	02:50 AM	9.6	293
	08:26 AM	3.3	101
	02:27 PM	11.6	354
	09:13 PM	0.0	0
5 W	03:50 AM	10.4	317
	09:21 AM	4.0	122
	03:05 PM	11.6	354
	09:53 PM	-1.0	-30
6 Th ○	04:44 AM	11.0	335
	10:13 AM	4.6	140
	03:42 PM	11.5	351
	10:32 PM	-1.6	-49
7 F	05:33 AM	11.4	347
	11:03 AM	5.1	155
	04:20 PM	11.2	341
	11:11 PM	-1.9	-58
8 Sa	06:20 AM	11.6	354
	11:53 AM	5.6	171
	04:59 PM	10.8	329
	11:51 PM	-1.8	-55
9 Su	07:06 AM	11.6	354
	12:43 PM	5.9	180
	05:40 PM	10.2	311
10 M	12:31 AM	-1.4	-43
	07:51 AM	11.5	351
	01:37 PM	6.1	186
	06:25 PM	9.5	290
11 Tu	01:13 AM	-0.8	-24
	08:36 AM	11.3	344
	02:36 PM	6.2	189
	07:14 PM	8.8	268
12 W	01:57 AM	0.0	0
	09:24 AM	11.1	338
	03:42 PM	6.0	183
	08:11 PM	8.1	247
13 Th	02:44 AM	0.9	27
	10:12 AM	10.9	332
	04:57 PM	5.6	171
	09:19 PM	7.5	229
14 F ◑	03:35 AM	1.9	58
	11:01 AM	10.7	326
	06:05 PM	5.0	152
	10:39 PM	7.2	219
15 Sa	04:32 AM	2.8	85
	11:48 AM	10.6	323
	06:58 PM	4.1	125
16 Su	12:05 AM	7.2	219
	05:36 AM	3.7	113
	12:30 PM	10.6	323
	07:39 PM	3.2	98
17 M	01:25 AM	7.7	235
	06:40 AM	4.4	134
	01:08 PM	10.6	323
	08:11 PM	2.3	70
18 Tu	02:31 AM	8.4	256
	07:40 AM	4.9	149
	01:42 PM	10.6	323
	08:41 PM	1.3	40
19 W	03:23 AM	9.2	280
	08:32 AM	5.4	165
	02:14 PM	10.7	326
	09:10 PM	0.4	12
20 Th	04:06 AM	9.9	302
	09:19 AM	5.8	177
	02:46 PM	10.7	326
	09:41 PM	-0.5	-15
21 F	04:45 AM	10.5	320
	10:02 AM	6.1	186
	03:18 PM	10.8	329
	10:15 PM	-1.2	-37
22 Sa ●	05:23 AM	11.1	338
	10:45 AM	6.3	192
	03:52 PM	10.7	326
	10:52 PM	-1.8	-55
23 Su	06:02 AM	11.5	351
	11:29 AM	6.5	198
	04:29 PM	10.7	326
	11:32 PM	-2.1	-64
24 M	06:43 AM	11.8	360
	12:15 PM	6.5	198
	05:10 PM	10.5	320
25 Tu	12:14 AM	-2.2	-67
	07:27 AM	11.9	363
	01:05 PM	6.5	198
	05:57 PM	10.1	308
26 W	01:00 AM	-1.9	-58
	08:13 AM	12.0	366
	02:01 PM	6.2	189
	06:51 PM	9.6	293
27 Th	01:48 AM	-1.2	-37
	09:01 AM	12.0	366
	03:04 PM	5.8	177
	07:56 PM	8.9	271
28 F	02:40 AM	-0.2	-6
	09:51 AM	11.9	363
	04:13 PM	5.1	155
	09:14 PM	8.3	253
29 Sa ◐	03:37 AM	1.0	30
	10:41 AM	11.9	363
	05:24 PM	4.0	122
	10:44 PM	7.9	241
30 Su	04:40 AM	2.4	73
	11:31 AM	11.9	363
	06:28 PM	2.8	85

December

Day	Time (h m)	Height (ft)	Height (cm)
1 M	12:22 AM	8.1	247
	05:49 AM	3.6	110
	12:20 PM	11.8	360
	07:23 PM	1.4	43
2 Tu	01:54 AM	8.8	268
	07:02 AM	4.7	143
	01:06 PM	11.8	360
	08:11 PM	0.2	6
3 W	03:08 AM	9.7	296
	08:10 AM	5.4	165
	01:50 PM	11.7	357
	08:54 PM	-0.8	-24
4 Th	04:08 AM	10.6	323
	09:12 AM	5.9	180
	02:31 PM	11.5	351
	09:35 PM	-1.5	-46
5 F	04:58 AM	11.3	344
	10:08 AM	6.2	189
	03:12 PM	11.3	344
	10:13 PM	-1.9	-58
6 Sa ○	05:42 AM	11.7	357
	10:59 AM	6.4	195
	03:52 PM	10.9	332
	10:51 PM	-1.9	-58
7 Su	06:21 AM	11.9	363
	11:47 AM	6.5	198
	04:33 PM	10.5	320
	11:29 PM	-1.7	-52
8 M	06:57 AM	11.9	363
	12:34 PM	6.5	198
	05:15 PM	10.0	305
9 Tu	12:07 AM	-1.3	-40
	07:32 AM	11.9	363
	01:21 PM	6.3	192
	05:59 PM	9.5	290
10 W	12:45 AM	-0.7	-21
	08:07 AM	11.8	360
	02:09 PM	6.1	186
	06:47 PM	8.9	271
11 Th	01:25 AM	0.1	3
	08:42 AM	11.7	357
	03:01 PM	5.8	177
	07:40 PM	8.3	253
12 F	02:06 AM	1.0	30
	09:20 AM	11.5	351
	03:55 PM	5.3	162
	08:41 PM	7.7	235
13 Sa	02:49 AM	2.1	64
	09:59 AM	11.3	344
	04:52 PM	4.7	143
	09:53 PM	7.3	223
14 Su ◑	03:36 AM	3.2	98
	10:40 AM	11.2	341
	05:47 PM	3.9	119
	11:16 PM	7.2	219
15 M	04:31 AM	4.4	134
	11:21 AM	11.0	335
	06:35 PM	3.0	91
16 Tu	12:46 AM	7.6	232
	05:35 AM	5.5	168
	12:03 PM	10.9	332
	07:17 PM	2.0	61
17 W	02:09 AM	8.3	253
	06:45 AM	6.3	192
	12:43 PM	10.8	329
	07:56 PM	1.0	30
18 Th	03:11 AM	9.2	280
	07:52 AM	6.8	207
	01:23 PM	10.8	329
	08:33 PM	0.0	0
19 F	03:58 AM	10.0	305
	08:50 AM	7.0	213
	02:02 PM	10.9	332
	09:11 PM	-0.9	-27
20 Sa	04:38 AM	10.8	329
	09:40 AM	7.1	216
	02:42 PM	11.0	335
	09:50 PM	-1.7	-52
21 Su	05:14 AM	11.4	347
	10:27 AM	7.1	216
	03:24 PM	11.0	335
	10:31 PM	-2.3	-70
22 M ●	05:51 AM	11.9	363
	11:13 AM	6.9	210
	04:08 PM	11.0	335
	11:13 PM	-2.5	-76
23 Tu	06:29 AM	12.2	372
	12:01 PM	6.5	198
	04:57 PM	10.8	329
	11:58 PM	-2.4	-73
24 W	07:09 AM	12.5	381
	12:51 PM	6.0	183
	05:50 PM	10.5	320
25 Th	12:43 AM	-1.9	-58
	07:50 AM	12.6	384
	01:45 PM	5.4	165
	06:49 PM	9.9	302
26 F	01:30 AM	-0.9	-27
	08:32 AM	12.7	387
	02:43 PM	4.7	143
	07:54 PM	9.2	280
27 Sa	02:19 AM	0.4	12
	09:16 AM	12.6	384
	03:45 PM	3.8	116
	09:10 PM	8.5	259
28 Su ◐	03:12 AM	2.0	61
	10:02 AM	12.4	378
	04:50 PM	2.9	88
	10:40 PM	8.2	250
29 M	04:12 AM	3.6	110
	10:49 AM	12.2	372
	05:55 PM	1.8	55
30 Tu	12:25 AM	8.3	253
	05:23 AM	5.1	155
	11:39 AM	11.9	363
	06:54 PM	0.8	24
31 W	02:05 AM	9.1	277
	06:45 AM	6.2	189
	12:30 PM	11.6	354
	07:48 PM	-0.1	-3

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Referenced to Station: SEATTLE (Madison St.), Elliott Bay (9447130) Time offset in mins (high:10 low: 11) Height offset in feet (high: * 0.97 low: *0.95)

APPENDIX B

VISUAL INSPECTION FIELD FORMS AND COPIES OF LOGBOOK PAGES

Photo Stations for Slip 4 EAA Visual Monitoring

Date: 12 July 2014 Photographer: Susan FitzGerald Equipment: Olympus Stylus Tough - 8010

Photo Station ID	Target Coordinates Latitude	Target Coordinates Longitude	Marker Type/Condition	Target Photo Orientation (Degrees True North)	Actual Photo Orientation	Photo ID	Photo Numbers	Photo Time	Photo Target Area Description	Notes
A	47.536176	-122.319524	Good	55	39 m	A1	0119, 0120	1157	East-Central Sediment Cap	—
B	47.536635	-122.319241	Good	48	~~27~~ 22 m	B1	0121–0123	1203	North Sediment Cap	0122 azmuith was off ≈ 20 m
C	47.537207	-122.318901	Good	178	~~162~~ m	C1	0098, 0099	1108	Northwest Slope Cap, South Sediment Cap	—
				217	201 m	C2	0100, 0101, 0102	1110	Northwest Slope Cap	—
D	47.537020	-122.319224	Good	24	≈ 8 magnetic	D1	0092, 0093	1054	Northwest Beach/Anchored Logs	—
E	47.537169	-122.319075	Good, but tilted on arrival; straightened up	102	≈ 86 magnetic	E1	0094, 0095	1101	North Slope Cap, Outfalls	—
				144	128 m	E2	0096, 0097	1104	Northeast Slope Cap, North Rip Rap Slough	—
F	47.536756	-122.319169	marker on its side, but same location	133	117 m	F1	0124, 0125	1210	East Slope Cap, East Sediment Cap, Central Rip Rap Slough	—
				160	144 m	F2	0126, 0127	1213	Southeast Slope and Sediment Cap	—
G	47.536813	-122.318864	Good	200	184 m	G1	0113, 0114	1128	South Rip Rap Slough	—
				27	11 m	G2	0115, 0116	1130	North Rip Rap Slough, Sediment Cap, North Slope Cap	—
				0-360	NA	G3	0103–0112	1126	Entire Slip 4 EAA	—
H	47.536879	-122.318546	Good	306	290 NA	H1	0128, 0129	1240	Northwest Slope Cap, Beach Cap, Sediment Cap	Supplemental picture of slip facing 200° m #0130 (mouth of slip)
I	47.536322	-122.318486	Good	278	262 m	I1	0132, 0133	1248	West Sediment Cap	Supplemental picture of beach log facing 0° m #0131
J	47.535834	-122.319738	Good	130	114 m	J1	0117, 0118	1152	Southeast Slope Cap	—

Note: Magnetic North declination from True North for Seattle in July 2014 is 16.16 degrees (NOAA 2014: http://www.ngdc.noaa.gov/geomag-web/#declination).

Notes recorded by Jane Saxton (Integral)

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: SOUTHEAST SLOPE CAP **Time:** 0905

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☒ wood/shell fragments

Estimated thickness of fine sediment deposit: <1cm (~1-2mm)

Stratification: ~3cm gravel with brown sandy beneath

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): minimal scattered woody detritus, few leaves, algae on surface of cobble

Presence/description of debris/litter/garbage: styrofoam cups, trash on high tide mark carrot

Assessment of the re-establishment of intertidal aquatic habitat: No evidence

Observations of wildlife use (including avifauna and macroinvertebrates): Bird droppings

Observations of cap disturbance / erosion / changed conditions: no apparent change

Assessment of the cap integrity: good

Other observations /Notes: None

Observer: Susan

Area Observed: **Time:**

Substrate Classification: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit:

Stratification:

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.):

Organic matter accumulation (e.g., leaf litter, logs, woody debris):

Presence/description of debris/litter/garbage:

Assessment of the re-establishment of intertidal aquatic habitat:

Observations of wildlife use (including avifauna and macroinvertebrates):

Observations of cap disturbance / erosion / changed conditions:

Assessment of the cap integrity:

Other observations /Notes:

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: NORTHEAST SLOPE CAP **Time:** 0946

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: 1 mm or less

Stratification: 4 cm gravel over brown sandy gravel

Color: ☐ drab olive ☒ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Algae below high tide line, trace leaf litter, woody debris at high tide line

Presence/description of debris/litter/garbage: paper debris above high tide line

Assessment of the re-establishment of intertidal aquatic habitat: None

Observations of wildlife use (including avifauna and macroinvertebrates): Bird droppings

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

Area Observed: EAST SLOPE CAP **Time:** 0924

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: Algae growing on surface below high tide line

Stratification: None

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): ~~Plastic bottles, minor plastic trash~~ None

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Woody debritus at high tide line, leaf litter at high tide line

Presence/description of debris/litter/garbage: Minor plastic trash, plastic bottles, plastic cup, PVC pipe ~ 6-8 in in length

Assessment of the re-establishment of intertidal aquatic habitat: None observed

Observations of wildlife use (including avifauna and macroinvertebrates): None observed

Observations of cap disturbance / erosion / changed conditions: None

Assessment of the cap integrity: Good

Other observations /Notes: Supplemental photo #91 brown surface over black organic deposit (≈ 5 mm thick) on top of the gravel. H2S odor pervasive at boundary of unamended areas, scattered areas.

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: North Sediment Cap **Time:** 0954

Substrate Classification: ☐ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: trace (1mm or less)

Stratification: gravel (2cm) over clayey gravel, brown on surface dark gray below

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): woody detritus, algae

Presence/description of debris/litter/garbage: None observed

Assessment of the re-establishment of intertidal aquatic habitat: None observed

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

Area Observed: East Sediment Cap **Time:** 0929

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☒ organic matter ☒ wood/shell fragments

Estimated thickness of fine sediment deposit: ≈ 1 mm woody detritus minimal

Stratification: Similar to SE Sediment cap

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): trace leaf litter, algae, few shell fragments or wood debris

Presence/description of debris/litter/garbage: plastic bottle

Assessment of the re-establishment of intertidal aquatic habitat: None observed

Observations of wildlife use (including avifauna and macroinvertebrates): ~~None~~ Birds foraging

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: North Slope Cap **Time:** 1000

Substrate Classification: ☒ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments ☒ boulders

Estimated thickness of fine sediment deposit: 1-2 mm of sediment + organics (algae) on surface of boulders

Stratification: Some areas with no cobble 1.5 cm of organic clayey deposits over gravel with black below

Color: ☐ drab olive ☐ gray ☐ black ☒ brown surface ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): woody detritus, chitons, algae below high tide line

Presence/description of debris/litter/garbage: trace plastic litter

Assessment of the re-establishment of intertidal aquatic habitat: Barnacles on underside of boulders.

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

Area Observed: North Slope Cap @ outfalls **Time:** 1007

Substrate Classification: ☒ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit:

Stratification: Sandy gravel in between gravel at mouth of outfall

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): woody debris, increased leaf litter over the general area (immediately in front of outfall)

Presence/description of debris/litter/garbage: ~~None observed~~ yes, glass bottle, plastic debris near mouth of outfall

Assessment of the re-establishment of intertidal aquatic habitat: None

Observations of wildlife use (including avifauna and macroinvertebrates): None observed

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: NORTH RIPRAP SLOUGH **Time:** 1011

Substrate Classification: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: riprap extends 15' from outfall; silty sand in slough with patches of

Stratification: of gravel ~~in sedimentation area~~ // 1-5 mm fine sediment // up to 2 cm fines observed fine surface deposit of sand (black) below; alternating layers of sands + fines

Color: ☐ drab olive ☐ gray ☒ black below ☒ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): leaf + woody debris

Presence/description of debris/litter/garbage: strap (nylon web), cup, piece of plastic (≈ 3 in) plastic bottle

Assessment of the re-establishment of intertidal aquatic habitat: worm tubes

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: possibly larger area of fine deposits

Assessment of the cap integrity: Good

Other observations /Notes: Heterogeneous surface.

Observer:

Area Observed: CENTRAL RIPRAP SLOUGH **Time:** 1114

Substrate Classification: ☒ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: ~~[illegible]~~ 1-18 cm

Stratification: Fines on top cobble

Color: ☐ drab olive ☐ gray ☒ black below ☐ brown ☒ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): wood debris, leaf litter

Presence/description of debris/litter/garbage: ~~None observed~~ beverage lid

Assessment of the re-establishment of intertidal aquatic habitat: Barnacles

Observations of wildlife use (including avifauna and macroinvertebrates): Birds, droppings.

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes: Heterogeneous surface.

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: NORTH WEST SEDIMENT CAP **Time:** 1030

Substrate Classification: ☐ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: trace to 2.5 cm

Stratification: Brown surface, black below Fines on top of gravels in limited areas

Color: ☐ drab olive ☐ gray ☐ black ~~☒ brown~~ ☒ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Woody debris scattered

Presence/description of debris/litter/garbage: small plastic ribbon

Assessment of the re-establishment of intertidal aquatic habitat: ~~Birds~~, None observed

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: ~~Pictures~~ None observed

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

Area Observed: ~~SOUTH~~ WEST SEDIMENT CAP **Time:** 1138

Substrate Classification: ☐ cobble ☒ gravel ☒ sand C M F ☒ silt ~~clay~~ ☒ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: 0-9 cm observed

Stratification: Heterogeneous area and gravel appears hummocky similar to 2013. In between hummocks (poss. associated w/ drainage) is where fine seds occur

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☒ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): little wood debris

Presence/description of debris/litter/garbage: None observed

Assessment of the re-establishment of intertidal aquatic habitat: barnacles, green sea grass

Observations of wildlife use (including avifauna and macroinvertebrates): Birds, seagulls, ducks

Observations of cap disturbance / erosion / changed conditions: Since placement hummocks have developed but similar to 2013.

Assessment of the cap integrity: good.

Other observations /Notes: Fines on top of sand, fine deposit brown surface w/ black below

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: Northwest Slope Cap **Time:** 1022

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: 1 cm or less in limited areas

Stratification: 2cm gravel over sandy gravel

Color: ☐ drab olive ☒ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Woody detritus, algae below the high tide line

Presence/description of debris/litter/garbage: None observed

Assessment of the re-establishment of intertidal aquatic habitat: None observed

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: None overall, however gravel deposit is thinner in NW corner; possibly associated with drainage. Also areas of thin fine deposits in lower slope since 2012

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

Area Observed: Northwest Beach Cap + Anchored Logs **Time:** 1043

Substrate Classification: ☐ cobble ☐ gravel ☒ sand C (M) F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: Ø

Stratification: None observed

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Scattered woody debris, logs, planks

Presence/description of debris/litter/garbage: styrofoam cup, plastic bottle, chip bag

Assessment of the re-establishment of intertidal aquatic habitat: None observed

Observations of wildlife use (including avifauna and macroinvertebrates): Feathers, bird droppings, Birds

Observations of cap disturbance / erosion / changed conditions: Increased shrub growth, logs in good condition

Assessment of the cap integrity: Good

Other observations /Notes: —

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: South Riprap Slough **Time:** 1132

Substrate Classification: ☒ cobble ☒ gravel ☐ sand C M F ☒ silt ~~clay~~ ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: 0-5 cm

Stratification: Fines on top of cobbles

Color: ☐ drab olive ☐ gray ☒ black ☐ brown ☒ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed below

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Woody debris, branches, sticks

Presence/description of debris/litter/garbage: plastic debris

Assessment of the re-establishment of intertidal aquatic habitat: Barnacles, worm tubes

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: Increased fine deposition in lower areas

Assessment of the cap integrity: Good

Other observations /Notes: ~~Some posts~~ gas

Observer:

Area Observed: Central Sediment Cap **Time:** 1218

Substrate Classification: ☐ cobble ☒ gravel ☒ sand C M F ☒ silt ~~clay~~ ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: 0-2 cm as observed

Stratification: 2 cm of gravel over sandy gravel; areas of fine deposits.

Color: ☐ drab olive ☐ gray ☒ black ☐ brown ☒ brown surface ☐ other gravel is brown

Evidence of Pollution (sheen, etc.): None observed below for fines

Organic matter accumulation (e.g., leaf litter, logs, woody debris): trace small twigs

Presence/description of debris/litter/garbage: None observed

Assessment of the re-establishment of intertidal aquatic habitat: Barnacles, green sea grass (less dense than west sediment cap)

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: No observed change

Assessment of the cap integrity: Good

Other observations /Notes: Areas of fine deposits appeared to have occurred since 2012.

Observer:

VISUAL INSPECTION FORM

integral consulting inc.

Project Name: Slip 4 Long Term Monitoring **Project No.:** A0006-14O

Date: 12 July 2014 **Weather:**

Crew: J.Sexton, S.FitzGerald (Integral)

Area Observed: South Sediment Cap **Time:** 1207

Substrate Classification: ☐ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: Trace, but small areas up to 2.5cm (brown surface w/ dk gray below)

Stratification: 2cm of gravel over sandy gravel

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other

Evidence of Pollution (sheen, etc.): None observed

Organic matter accumulation (e.g., leaf litter, logs, woody debris): Trace wood debris (sm. sticks)

Presence/description of debris/litter/garbage: None observed

Assessment of the re-establishment of intertidal aquatic habitat: small patch of bright green sea grass, benthic aquatic invertebrate in sediment.

Observations of wildlife use (including avifauna and macroinvertebrates): Birds

Observations of cap disturbance / erosion / changed conditions: None observed

Assessment of the cap integrity: Good

Other observations /Notes:

Observer:

Area Observed: Southeast Sediment Cap **Time:** 0915

Substrate Classification: ☐ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Estimated thickness of fine sediment deposit: ≃ 1-2 mm in some locations of fine deposition (ranged)

Stratification: Algae on gravel with some ~~clayey sand underneath~~ Areas of sandy gravel

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface ☐ other ~~surface (yes)~~

Evidence of Pollution (sheen, etc.): None

Organic matter accumulation (e.g., leaf litter, logs, woody debris): minor leaf litter & small woody debris, algae

Presence/description of debris/litter/garbage: plastic bag, strawberry

Assessment of the re-establishment of intertidal aquatic habitat: No evidence

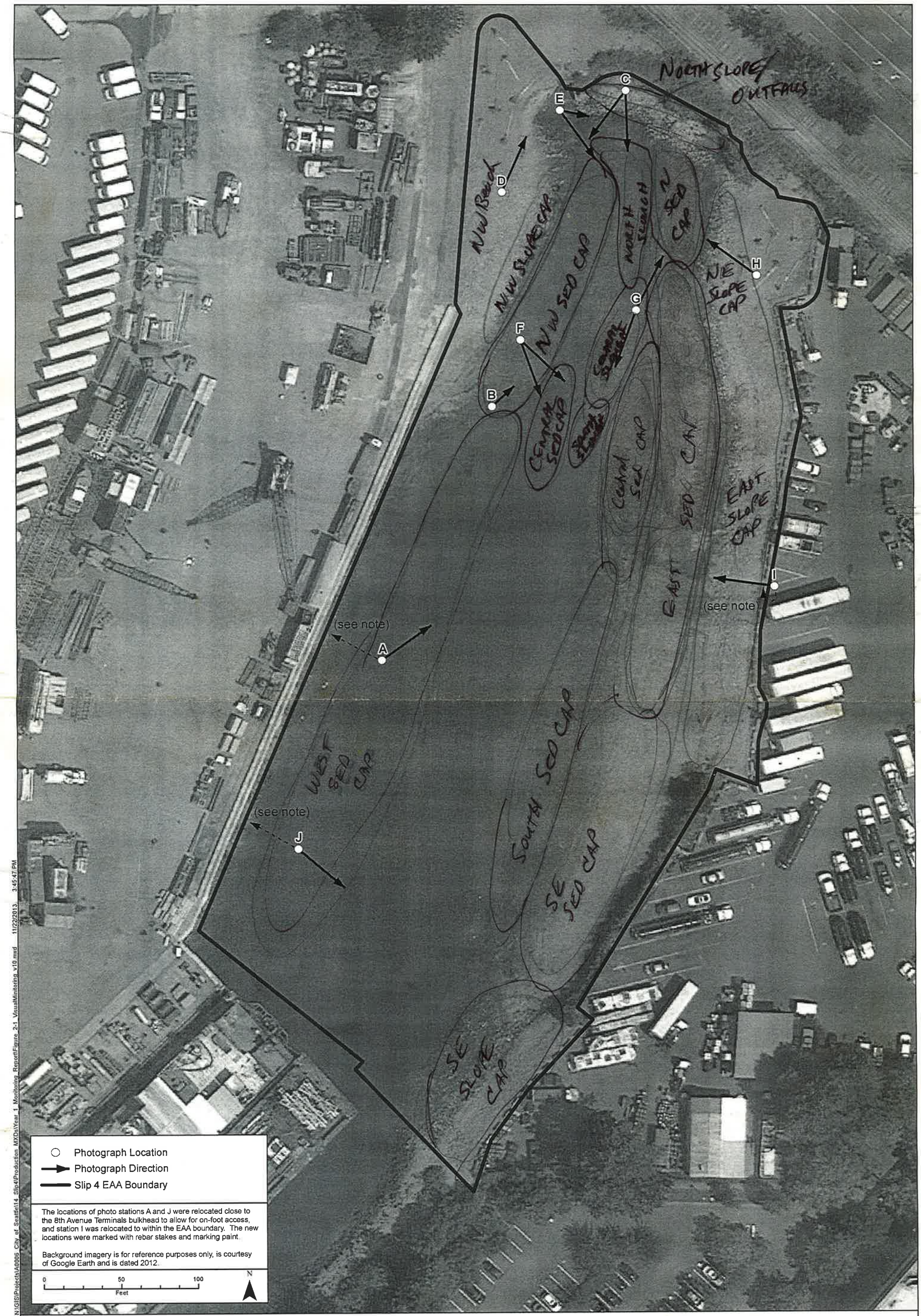
Observations of wildlife use (including avifauna and macroinvertebrates): Flies, Bird feather

Observations of cap disturbance / erosion / changed conditions: Sandy gravel areas may be evidence of ~~sediment~~ gravel redistribution

Assessment of the cap integrity: Good

Other observations /Notes:

Observer:



N:\GIS\Projects\A0006 City of Seattle\14 Slip4\Production MXDs\Year 1 Monitoring Report\Figure 2-1 VisualMonitoring v10.mxd 11/22/2013 3:45:47 PM

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Figure 2-1.
Visual Monitoring Station Locations
Slip 4 Early Action Area
Long-Term Monitoring Data Report - Year 1 (2013)

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CONTENTS

PAGE	REFERENCE	DATE
2-5	Year 1 Monitoring	22-23 July 2003
6	Year 2 Monitoring	12 July 2004

Year 2 Monitoring

12 JULY 2014 Susan Fitzgerald

0845 Arrived @ Webster parking lot: Susan Fitzgerald + Jane Sexton (Integral).

0848 Health + Safety briefing, covered Slips/trips/falls + heat stress hazards.

1329 Done w/ Year 2 CAP monitoring. Also decontaminated boots + spoon/ruler + discarded wash water + seal on site.

1344 We checked sign on dolphin. Appears in good shape

~~1345~~ Left site. ~1340

Rite in the Rain.

APPENDIX C

VISUAL INSPECTION PHOTOGRAPHS

APPENDIX C1

YEAR 2 (2014)

A1 East Central Sediment Cap. Azimuth 55° True. 1157 Pacific Daylight Time (PDT), water level approximately –3 feet MLLW.

B1 North Sediment Cap. Azimuth 38° True. 1203 PDT, water level approximately –3 feet MLLW.

C1 Northwest Slope Cap, South Sediment Cap. Azimuth 178° True. 1108 PDT, water level approximately –3 feet MLLW.

C2 Northwest Slope Cap. Azimuth 217° True. 1110 PDT, water level approximately –3 feet MLLW.

D1 Northwest Beach/Anchored Logs. Azimuth 24° True. 1054 PDT, water level approximately –3 feet MLLW.

E1 North Slope Cap, Outfalls. Azimuth 102° True. 1101 PDT, water level approximately –3 feet MLLW.

E2 Northeast Slope Cap, North Rip Rap Slough. Azimuth 144° True. 1104 PDT, water level approximately –3 feet MLLW.

F1 East Slope Cap, East Sediment Cap, Central Rip Rap Slough. Azimuth 133° True. 1210 PDT, water level approximately –3 feet MLLW.

F2 Southeast Slope and Sediment Cap. Azimuth 160° True. 1213 PDT, water level approximately –3 feet MLLW.

G1 South Rip Rap Slough. Azimuth 200° True. 1128 PDT, water level approximately –3 feet MLLW.

G2 North Riprap Slough, Sediment Cap, North Slope Cap. Azimuth 27° True. 1130 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (1 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (2 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (3 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (4 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (5 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (6 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (7 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (8 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (9 of 10). 1126 PDT, water level approximately –3 feet MLLW.

G3 Entire Slip 4 EAA (10 of 10). 1126 PDT, water level approximately –3 feet MLLW.

H1 Northwest Slope Cap, Beach Cap, Sediment Cap. Azimuth 306° True.1240 PDT, water level approximately –2 feet MLLW.

I1 West Sediment Cap. Azimuth 278° True.1248 PDT, water level approximately –2 feet MLLW.

J1 Southeast Slope Cap. Azimuth 130° True. 1152 PDT, water level approximately –3 feet MLLW.

Additional photo: Northeast Pocket Beach. Azimuth 344° True. 1240 PDT.

APPENDIX C2

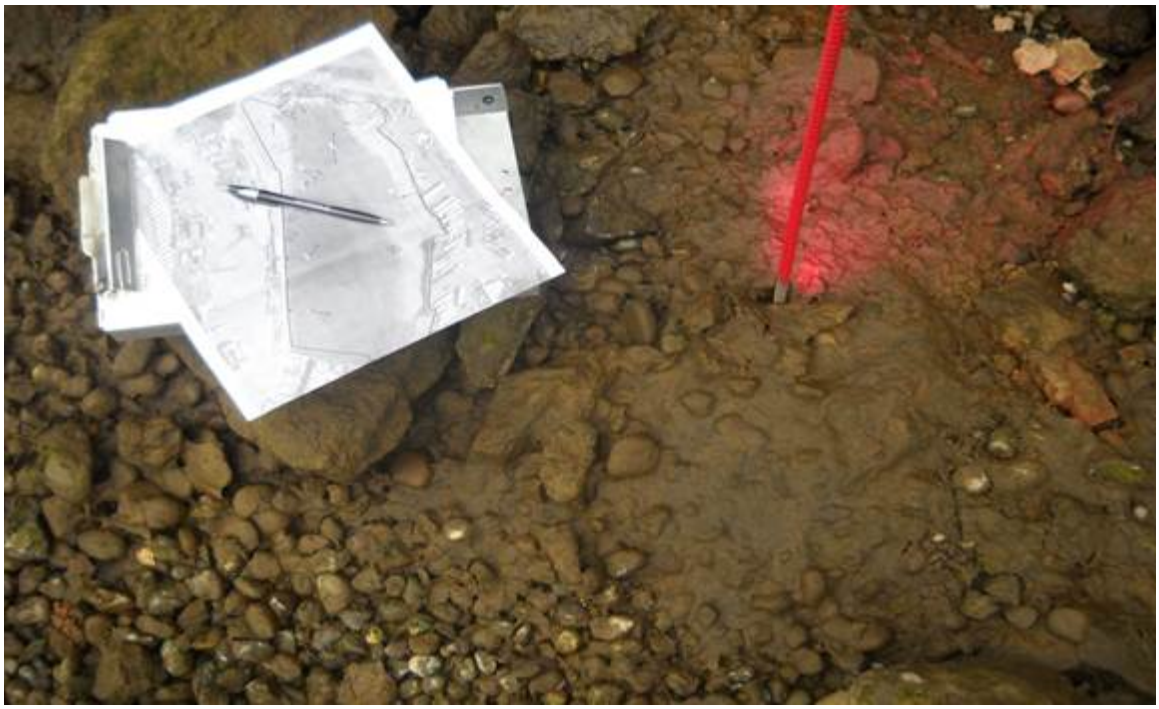
PRIOR YEARS

A1_East Central Sediment Cap_2013

A1_East Central Sediment Cap – Azimuth 55 M_2013

A1_East Central Sediment Cap_2012

B1_North Sediment Cap – Azimuth 48 T_2013



B1_North Sediment Cap Fines_2013

C1_Northwest Slope Cap and South Sediment Cap – Azimuth 178 T_2013

C1_Northwest Slope Cap and South Sediment Cap_2012

C2_Northwest Slope Cap - Azimuth 217T_2013

D1_Northwest Beach/Anchored Logs – Azimuth 24 T_2013

D1_Northwest Beach/Anchored Logs_2012

E1_North Slope Cap and Outfalls – Azimuth 102 T_2013

E1_North Slope Cap and Outfalls _2012

E2_Northeast Slope Cap and North Rip Rap Slough – Azimuth 144 T_2013

E2_Northeast Slope Cap and North Rip Rap Slough_2012

F1_East Slope Cap, East Sediment Cap, and Central Rip Rap Slough – Azimuth 133
T_2013

F1_East Slope Cap, East Sediment Cap, and Central Rip Rap Slough_2012

F2_Southeast Slope and Sediment Cap – Azimuth 160 T_2013

F2_Southeast Slope and Sediment Cap –2012

G1_South Rip Rap Slough – Azimuth 200 T_2013

G1_South Rip Rap Slough_2012

G2_North Rip Rap Slough, Sediment Cap, and North Slope Cap – Azimuth 27 T_2013

G2_North Rip Rap Slough, Sediment Cap, and North Slope Cap_2012

G2_North Rip Rap Slough – Sediment Fines_2013

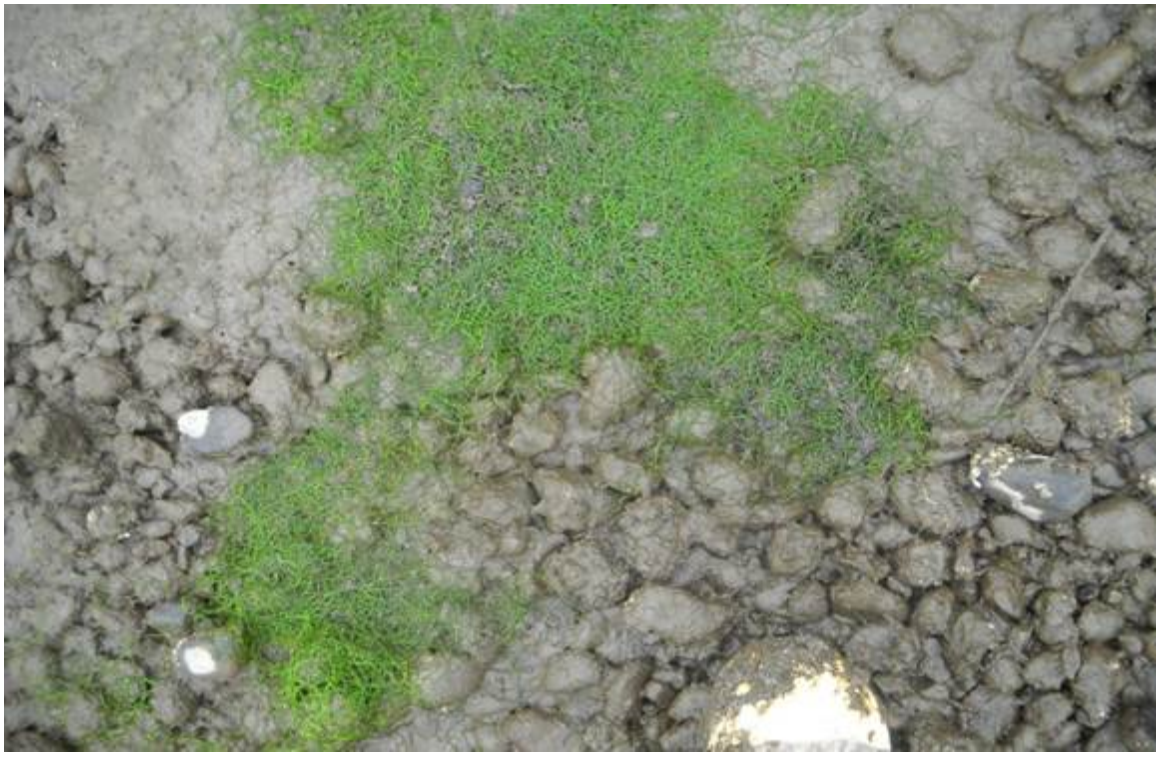
H1_Marker Stake – Azimuth 70 T_2013

H1_Northwest Slope Cap, Beach Cap, and Sediment Cap – Azimuth 306 T_2013

I1_West Sediment Cap_2013_Azimuth 278 T_2013

I1_West Sediment Cap_2013

I1_West Sediment Cap – 2013



I1_West Sediment Cap – Sediment Fines_algae_2013

J1_Southeast Slope Cap – Azimuth 130 T (estimated)_2013

J1_Southeast Slope Cap – Azimuth 130_2013

G3_Entire Slip 4 EAA 1 of 12 – taken in 2013

G3_Entire Slip 4 EAA 2 of 12 – taken in 2013

G3_Entire Slip 4 EAA 3 of 12 – taken in 2013

G3_Entire Slip 4 EAA 4 of 12 – taken in 2013

G3_Entire Slip 4 EAA 5 of 12 – taken in 2013

G3_Entire Slip 4 EAA 6 of 12 – taken in 2013

G3_Entire Slip 4 EAA 7 of 12 – taken in 2013

G3_Entire Slip 4 EAA 8 of 12 – taken in 2013

G3_Entire Slip 4 EAA 9 of 12 – taken in 2013

G3_Entire Slip 4 EAA 10 of 12 – taken in 2013

G3_Entire Slip 4 EAA 11 of 12 – taken in 2013

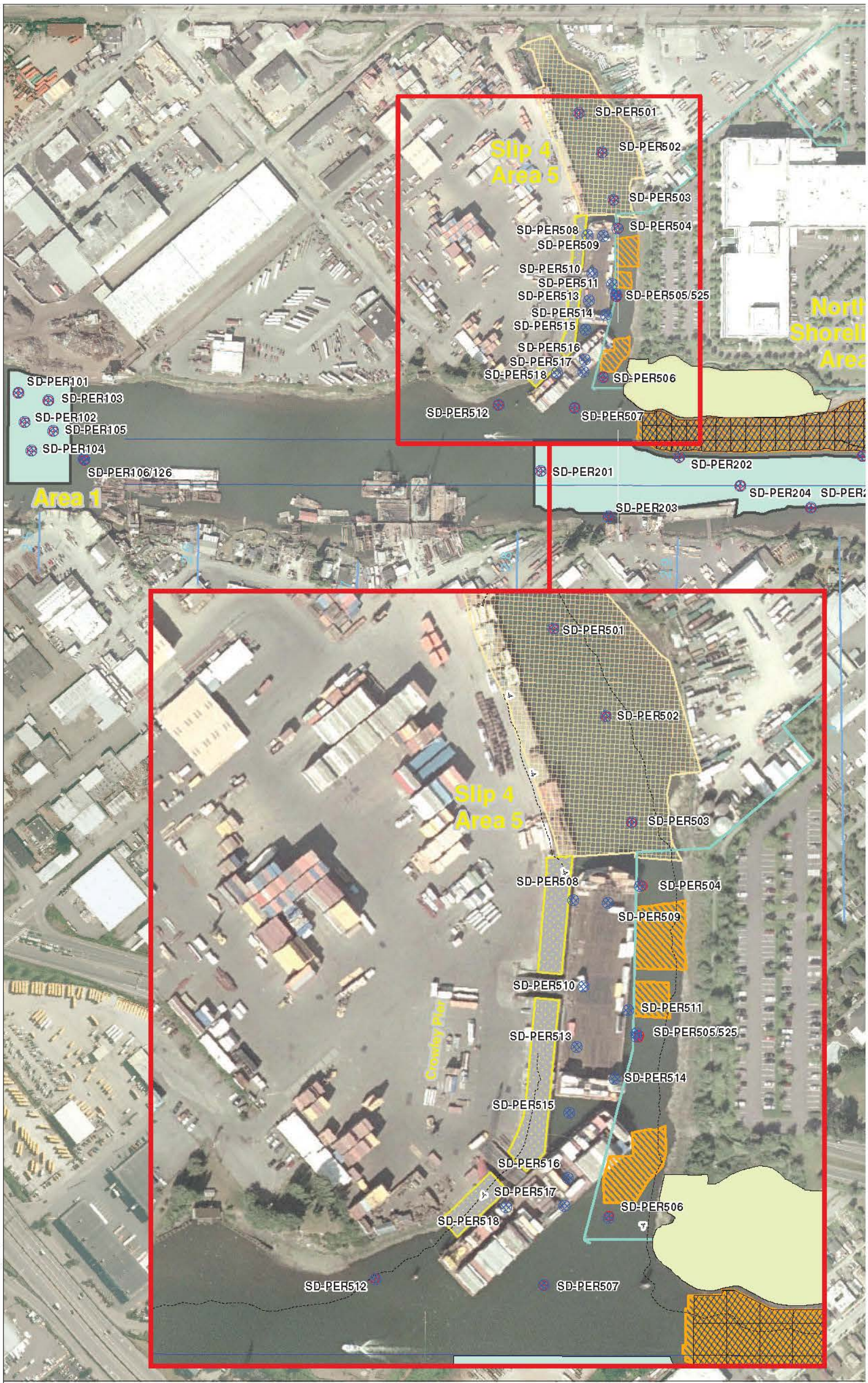
G3_Entire Slip 4 EAA 12 of 12 – taken in 2013

APPENDIX C3

YEAR 2 (2014) PHOTOS IN JPEG FORMAT (ON CD)

APPENDIX D

BOEING PERIMETER MONITORING SAMPLE RESULTS FROM AMEC (2014)



(Excerpted from AMEC 2014)

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Figure D-1.
Boeing Sample Locations
Slip 4 Early Action Area
Long-Term Monitoring Data Report – Year 2 (2014)

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS 1, 2

2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

	Location	SD-PER501												SD-PER502												SD-PER503											
	Contruction Season	Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3					
	Sampling Event	Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction		
	Collection Date	12/21/2012			3/27/2013			9/10/2014						12/21/2012			3/27/2013			9/10/2014						12/21/2012			3/27/2013			9/10/2014					
	Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID	SD-PER501-1212			SD-PER501-0313			SD-PER501-0914						SD-PER502-1212			SD-PER502-0313			SD-PER502-0914						SD-PER503-1212			SD-PER503-0313			SD-PER503-0914					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																					
Total Organic Carbon (percent)	—	2.13		J	0.805			3.47						1.48		J	1.26			2.44						2.73		J	4.14			2.82					
Metals (mg/kg)																																					
Arsenic	57	7.4			3.2			13.3						4.2			4.2			11.4						11.5			11.7			14.4					
Cadmium	5.1	0.6			0.4			0.8						0.4			0.5			0.6	U					0.6			0.9			0.5	U				
Chromium	260	27.2			14.5		J	43						25.6			17.6			40						34			29			38					
Copper	390	41.1			20.9		J	83.6						20.9			19.4			72.3						43.6			50.6			72.6					
Lead	450	17			3			41						5			4			30						15			18			31					
Mercury	0.41	0.06			0.02	U		0.13						0.06			0.03			0.14						0.11			0.12			0.16					
Silver	6.1	0.5	U		0.3	U		0.9	U					0.4	U		0.4	U		0.9	U					0.5	U		0.7	U		0.8	U				
Zinc	410	99			33			233						45			38			156						93			98			147					
PCBs (µg/kg)																																					
Aroclor 1016	NE	4	U		3.7	U		11	U					3.9	U		3.8	U		10	U					3.9	U		3.9	U		10	U				
Aroclor 1221	NE	4	U		3.7	U		11	U					3.9	U		3.8	U		10	U					3.9	U		3.9	U		10	U				
Aroclor 1232	NE	4	U		3.7	U		11	U					3.9	U		3.8	U		10	U					3.9	U		3.9	U		10	U				
Aroclor 1242	NE	4	U		3.7	U		11	U					3.9	U		3.8	U		10	U					3.9	U		3.9	U		10	U				
Aroclor 1248	NE	30			5.6	Y	UY	130						13			9.6	Y	UY	87						26			50			120					
Aroclor 1254	NE	57			9.9			170						31			18			120						54			83			140					
Aroclor 1260	NE	30			4.6			94						14			11			83						36			61			97					
Total PCBs (µg/kg Dry-Weight)	130	117			14.5			394						58			29			290						116			194			357					
Total PCBs (mg/kg OC) [4]	12	5.5		J [8]	1.8			11.4						3.9		J [8]	2.3			11.9						4.2		J [8]	—			12.7					

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   Y = analyte not detected at the reporting limit provided.
   The reporting limit is raised due to chromatographic interferences.
2. Validation qualifiers (Q2) are defined as follows:
   UY = material was not detected; raised reporting limit
   J = analyte positively identified; value is approximate concentration in sample.
3. Criteria obtained from Table 3 of Construction and Post-Construction Sediment Monitoring QAPP (AMEC et al. 2012g).
4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
6. Split sample analyzed at this location
7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

Abbreviation(s)

ft = feet
mg/kg = milligrams per kilogram
mg/kg OC = milligrams per kilogram organic carbon
PCBs = polychlorinated biphenyls
Q1 = laboratory qualifiers
Q2 = validation qualifiers
QAPP = Quality Assurance Project Plan
SMS SQS = Washington Sediment Management Standards Sediment Quality Standards (173-204-320 WAC)
µg/kg = micrograms per kilogram
µg/kg Dry-Weight = micrograms per kilogram dry weight

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS 1, 2

2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

	Location	SD-PER504												SD-PER505												SD-PER506											
	Contruction Season	Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3					
	Sampling Event	Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction		
	Collection Date	12/14/2012			3/6/2013			9/10/2014						12/13/2012			3/6/2013			9/10/2014						12/13/2012			3/7/2013			9/11/2014					
	Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID	SD-PER504-1212			SD-PER504-0313			SD-PER504-0914						SD-PER505-1212			SD-PER505-0313			SD-PER505-0914						SD-PER506-1212			SD-PER506-0313			SD-PER506-0914					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																					
Total Organic Carbon (percent)	—	3.21			3.86			3						3.05			2.34		J	2.73		J				3.02			3.53			2.74					
Metals (mg/kg)																																					
Arsenic	57	15.8			14.7			15.3						13			13.1			16.3						10.6			10.1			10.6					
Cadmium	5.1	0.7			1.1			0.5	U					0.7			0.9			0.5						0.8			0.9			0.5					
Chromium	260	35			35			37						33			30			51		J				32			28			34					
Copper	390	64.7			68.8			63.5						58.4			52.8			63.6						54.3			46.7			57.5					
Lead	450	25			23			25						25			20			25						20			18			24					
Mercury	0.41	0.19			0.17			0.15						0.14			0.12			0.11						0.13		J	0.13			0.16					
Silver	6.1	0.8	U		0.8	U		0.8	U					0.7	U		0.7	U		0.7	U					0.7	U		0.7	U		0.6	U				
Zinc	410	123			122			131						116			103			131						110			97			116					
PCBs (µg/kg)																																					
Aroclor 1016	NE	20	U		3.9	U		4	U					20	U		3.9	U		3.9	U					3.9	U		4	U		9	U				
Aroclor 1221	NE	20	U		3.9	U		4	U					20	U		3.9	U		3.9	U					3.9	U		4	U		9	U				
Aroclor 1232	NE	20	U		3.9	U		4	U					20	U		3.9	U		3.9	U					3.9	U		4	U		9	U				
Aroclor 1242	NE	20	U		3.9	U		4	U					20	U		3.9	U		3.9	U					3.9	U		4	U		9	U				
Aroclor 1248	NE	44			51			64		J				99			100		J	80						32			62			67					
Aroclor 1254	NE	110			86			110						230			160		J	120						66			100			120					
Aroclor 1260	NE	75			64			84						93			99			98						35			55			64					
Total PCBs (µg/kg Dry-Weight)	130	229			201			258		J [7]				422			359		J [7]	298						133			217			251					
Total PCBs (mg/kg OC) [4]	12	7.1			5.2			8.6		J [8]				13.8			15.3		J [8]	10.9		J [8]				4.4			6.1			9.2					

Note(s)

1. Laboratory data flags (Q1) are as follows:
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   Y = analyte not detected at the reporting limit provided.
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4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
6. Split sample analyzed at this location
7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS 1, 2

2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

	Location	SD-PER507												SD-PER508												SD-PER509											
	Contruction Season	Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3					
	Sampling Event	Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction		
	Collection Date	12/5/2012			3/7/2013			9/11/2014						2/14/2012			3/5/2013			9/10/2014						2/14/2012			3/6/2013			9/10/2014					
	Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID	SD-PER507-1212			SD-PER507-0313			SD-PER507-0914						SD0052 [5]			SD-PER508-0313			SD-PER508-0914						SD0051 [5]			SD-PER509-0313			SD-PER509-0914					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																					
Total Organic Carbon (percent)	—	3.35		J	3.56			3						0.085			3.54			2.87		J				0.171			2.57			2.96					
Metals (mg/kg)																																					
Arsenic	57	19.3			11.8			12.1									15.3			17									14.9			15.5					
Cadmium	5.1	0.6			0.9			0.5									1.1			0.5	U								1.1			0.5					
Chromium	260	31			27			77									35			39									34			36					
Copper	390	53.3			42.4			58.7									69.4			70									67.8			62.7					
Lead	450	21			13			24									24			29									21			27					
Mercury	0.41	0.13			0.17			0.13									0.18			0.15									0.16			0.27					
Silver	6.1	0.7	U		0.8	U		0.7	U								0.7	U		0.8	U								0.8	U		0.8	U				
Zinc	410	110		J	88			125									128			141									117			130					
PCBs (µg/kg)																																					
Aroclor 1016	NE	3.8	U		3.9	U		9.2	U					4	U		3.8	U		9.9	U					3.9	U		3.9	U		10	U				
Aroclor 1221	NE	3.8	U		3.9	U		9.2	U					4	U		3.8	U		9.9	U					3.9	U		3.9	U		10	U				
Aroclor 1232	NE	3.8	U		3.9	U		9.2	U					4	U		3.8	U		9.9	U					3.9	U		3.9	U		10	U				
Aroclor 1242	NE	3.8	U		3.9	U		9.2	U					4	U		3.8	U		9.9	U					3.9	U		3.9	U		10	U				
Aroclor 1248	NE	38	Y	UY	64			62						4	U		68			82		J				3.9	U		63			83		J			
Aroclor 1254	NE	83			100			130						4	U		100			120						3.9	U		110			140					
Aroclor 1260	NE	55			59			76						4	U		73			95						3.9	U		73			100					
Total PCBs (µg/kg Dry-Weight)	130	138			223			268						4	U		241			297		J [7]				3.9	U		246			323		J [7]			
Total PCBs (mg/kg OC) [4]	12	4.1		J [8]	6.3			8.9						—			6.8			10.3		J [8]				—			9.6			10.9		J [8]			

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   Y = analyte not detected at the reporting limit provided.
   The reporting limit is raised due to chromatographic interferences.
2. Validation qualifiers (Q2) are defined as follows:
   UY = material was not detected; raised reporting limit
   J = analyte positively identified; value is approximate concentration in sample.
3. Criteria obtained from Table 3 of Construction and Post-Construction Sediment Monitoring QAPP (AMEC et al. 2012g).
4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
6. Split sample analyzed at this location
7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS 1, 2

2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

	Location	SD-PER510												SD-PER511															SD-PER512											
	Contruction Season	Construction Season 1						Construction Season 3						Construction Season 1									Construction Season 3						Construction Season 1						Construction Season 3					
	Sampling Event	Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction		
	Collection Date	10/31/2012			3/5/2013			9/10/2014						10/31/2012			10/31/2012			3/6/2013			9/10/2014						12/5/2012			3/8/2013			9/11/2014					
	Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID	SD0058 [5]			SD-PER510-0313			SD-PER510-0914						SD0062 [5,6]			SD0063 [5,6]			SD-PER511-0313			SD-PER511-0914						SD-PER512-1212			SD-PER512-0313			SD-PER512-0914					
Analyte	SMS SQS Criteria [3]	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2	Value	Q1	Q2
Conventionals																																								
Total Organic Carbon (percent)	—	3.19			3.85			2.83						3.14			3.14			4.55			1.79						2.48			2.21			1.62					
Metals (mg/kg)																																								
Arsenic	57				16			14.9												13.2			16.2						16			31.7			26.1					
Cadmium	5.1				1.2			0.5	U											1.2			0.6						0.4			0.8			0.3	U				
Chromium	260				36			38												33			38						29			27.3			30.7					
Copper	390				75.5			65												61.2			64						49.1			58.1			60.1					
Lead	450				24			27												23			26						23			27			26					
Mercury	0.41				0.2			0.16												0.15			0.22						0.1			0.07			0.05					
Silver	6.1				0.7	U		0.8	U											0.8	U		0.8	U					0.6	U		0.5	U		0.5	U				
Zinc	410				124			134												120			132						146			160			158					
PCBs (µg/kg)																																								
Aroclor 1016	NE	19	U		3.8	U		4	U					19	U		20	U		3.9	U		10	U					3.9	U		4	U		3.9	U				
Aroclor 1221	NE	19	U		3.8	U		4	U					19	U		20	U		3.9	U		10	U					3.9	U		4	U		3.9	U				
Aroclor 1232	NE	19	U		3.8	U		4	U					19	U		20	U		3.9	U		10	U					3.9	U		4	U		3.9	U				
Aroclor 1242	NE	19	U		3.8	U		4	U					19	U		20	U		3.9	U		10	U					3.9	U		4	U		3.9	U				
Aroclor 1248	NE	150			95			70						130			160			69			94						19	Y		36			22					
Aroclor 1254	NE	320			130			130						300			370			120			210						55			63			56					
Aroclor 1260	NE	150			84			100						110			150			78			160						37			37			35					
Total PCBs (µg/kg Dry-Weight)	130	620			309			300						540			680			267			464						92			136			113					
Total PCBs (mg/kg OC) [4]	12	19.4			8.0			10.6						17.2			21.7			—			25.9						3.7			6.2			7.0					

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   Y = analyte not detected at the reporting limit provided.
   The reporting limit is raised due to chromatographic interferences.
2. Validation qualifiers (Q2) are defined as follows:
   UY = material was not detected; raised reporting limit
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3. Criteria obtained from Table 3 of Construction and Post-Construction Sediment Monitoring QAPP (AMEC et al. 2012g).
4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
6. Split sample analyzed at this location
7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS 1, 2

2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

	Location	**SD-PER513**												**SD-PER514**												**SD-PER515**											
	Contruction Season	**Construction Season 1**						**Construction Season 3**						**Construction Season 1**						**Construction Season 3**						**Construction Season 1**						**Construction Season 3**					
	Sampling Event	**Pre-Construction**			**Post-Construction**			**Pre-Construction**			**Post-Construction**			**Pre-Construction**			**Post-Construction**			**Pre-Construction**			**Post-Construction**			**Pre-Construction**			**Post-Construction**			**Pre-Construction**			**Post-Construction**		
	Collection Date	**10/31/2012**			**3/5/2013**			**9/10/2014**						**10/30/2012**			**3/6/2013**			**9/12/2014**						**10/30/2012**			**3/5/2013**			**9/12/2014**					
	Sample Depth (ft)	**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**		
	Sample ID	**SD0059 [5]**			**SD-PER513-0313**			**SD-PER513-0914**						**SD0061 [5]**			**SD-PER514-0313**			**SD-PER514-0914**						**SD0060 [5]**			**SD-PER515-0313**			**SD-PER515-0914**					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																					
Total Organic Carbon (percent)	—	3.78			3.89			2.33						2.92			4.73			1.99						3.35			4.07			2.19					
Metals (mg/kg)																																					
Arsenic	57				14.7			14.6									11.7			13.3									13.1			14.3					
Cadmium	5.1				1.2			0.5	U								1.1			0.4	U								1.1			0.5					
Chromium	260				36			38									32			35									34			35					
Copper	390				73.5			70.2									57.8			61.9									62.5			66.4					
Lead	450				24			29									21			25									24			27					
Mercury	0.41				0.23			0.19									0.18			0.12									0.17			0.12					
Silver	6.1				0.8	U		0.8	U								0.7	U		0.6	U								0.7	U		0.7	U				
Zinc	410				120			135									111			126									116			129					
PCBs (µg/kg)																																					
Aroclor 1016	NE	19	U		3.8	U		10	U					40	U		4	U		3.9	U					38	U		3.9	U		4	U				
Aroclor 1221	NE	19	U		3.8	U		10	U					40	U		4	U		3.9	U					38	U		3.9	U		4	U				
Aroclor 1232	NE	19	U		3.8	U		10	U					40	U		4	U		3.9	U					38	U		3.9	U		4	U				
Aroclor 1242	NE	19	U		3.8	U		10	U					40	U		4	U		3.9	U					38	U		3.9	U		4	U				
Aroclor 1248	NE	68			130			90						38			81			57						29			68			62					
Aroclor 1254	NE	150			150			150						84			130			120						64			100			120					
Aroclor 1260	NE	98			82			110						48			97			74						47			82			73					
Total PCBs (µg/kg Dry-Weight)	130	316			362			350						170			308			251						140			250			255					
Total PCBs (mg/kg OC) [4]	12	8.4			9.3			15.0						5.8			—			12.6						4.2			—			11.6					

Note(s)

1. Laboratory data flags (Q1) are as follows:
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4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
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7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

TABLE 9-5

PERIMETER MONITORING SAMPLE RESULTS [1, 2]
2012-2015 Construction Completion Report
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

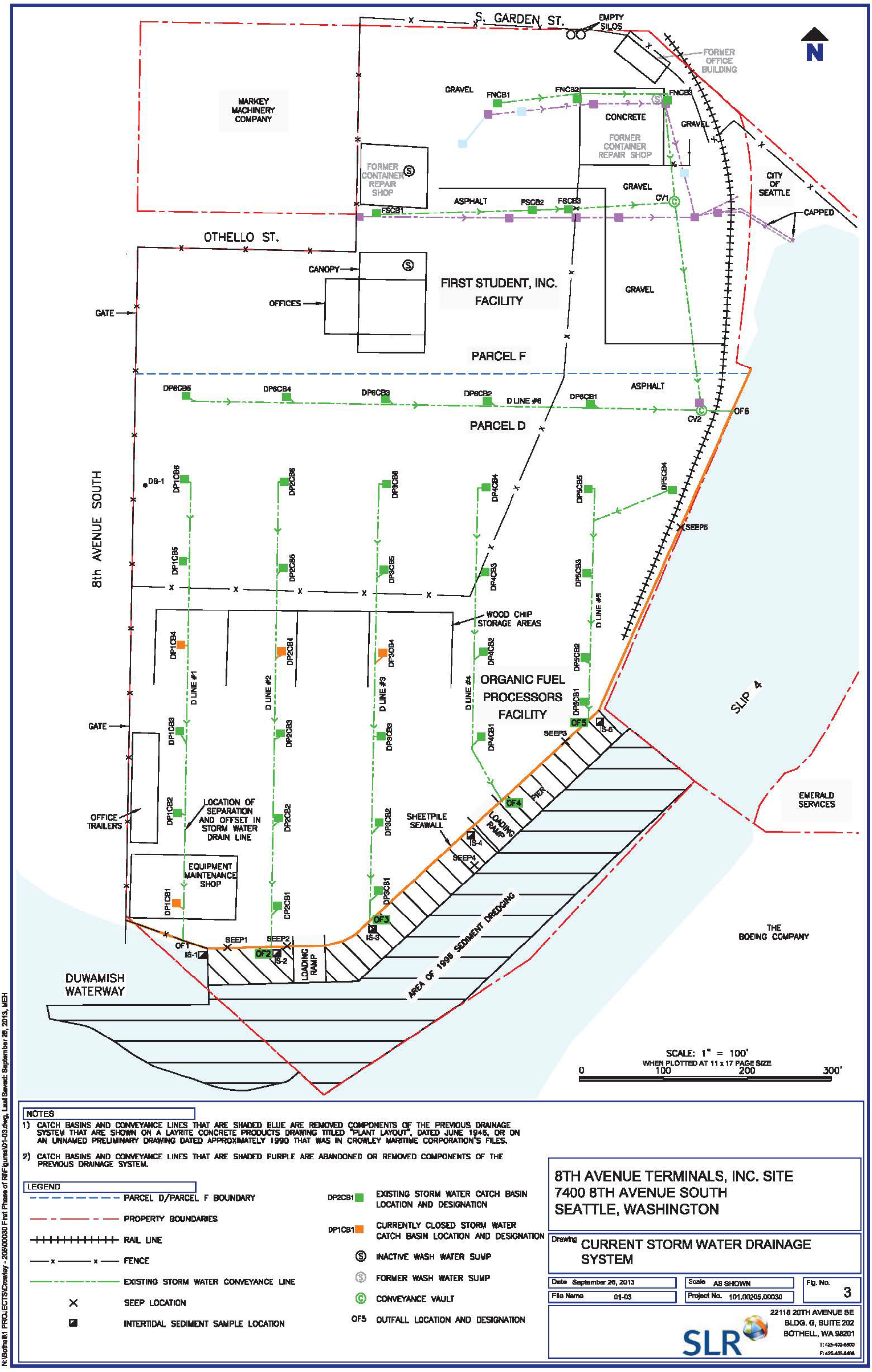
	Location	SD-PER516												SD-PER517												SD-PER518												SD-PER525 (Field Dup. for SD-PER505)											
	Contruction Season	Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3						Construction Season 1						Construction Season 3					
	Sampling Event	Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction			Pre-Construction			Post-Construction		
	Collection Date				3/7/2013			9/16/2014									3/7/2013			9/12/2014									3/7/2013			9/11/2014						12/13/2012			3/6/2013			9/10/2014					
	Sample Depth (ft)				0 - 0.33			0 - 0.33			0 - 0.33						0 - 0.33			0 - 0.33			0 - 0.33						0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID				SD-PER516-0313			SD-PER516-0914									SD-PER517-0313			SD-PER517-0914									SD-PER518-0313			SD-PER518-0914						SD-PER525-1212			SD-PER525-0313			SD-PER525-0914					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																																	
Total Organic Carbon (percent)	—				3.41			1.14									6.27			2.72									2.34			3						2.64			3.39		J	1.47		J			
Metals (mg/kg)																																																	
Arsenic	57				9.6			12.1									11.2			12.4									13.9			12.2						10.4			13.1			14					
Cadmium	5.1				0.9			0.5									0.7			0.5									0.9			0.5						0.7			1.2			0.5					
Chromium	260				26			35									19			34									30			56						29			34			36		J			
Copper	390				46.1			65.4									33			57.6									58.1			62.4						48.2			65			62.9					
Lead	450				18			25									14			24									23			25						22			26			26					
Mercury	0.41				0.15			0.11									0.11			0.15									0.15		J	0.14						0.08			0.17			0.16					
Silver	6.1				0.7	U		0.7	U								0.8	U		0.6	U								0.7	U		0.7	U					0.7	U		0.7	U		0.7	U				
Zinc	410				94			122									67			121									109			119						101			124			127					
PCBs (µg/kg)																																																	
Aroclor 1016	NE				3.8	U		4	U								4	U		3.8	U								4	U		9.2	U					19	U		3.9	U		4	U				
Aroclor 1221	NE				3.8	U		4	U								4	U		3.8	U								4	U		9.2	U					19	U		3.9	U		4	U				
Aroclor 1232	NE				3.8	U		4	U								4	U		3.8	U								4	U		9.2	U					19	U		3.9	U		4	U				
Aroclor 1242	NE				3.8	U		4	U								4	U		3.8	U								4	U		9.2	U					19	U		3.9	U		4	U				
Aroclor 1248	NE				60			58									75			55									86			72						99			190		J	64					
Aroclor 1254	NE				100			110									130			110									140			140						200			300		J	100					
Aroclor 1260	NE				53			64									76			67									100			80						86			120			80					
Total PCBs (µg/kg Dry-Weight)	130				213			232									281			232									326			292						385			610		J [7]	244					
Total PCBs (mg/kg OC) [4]	12				6.2			20.4									—			8.5									13.9			9.7						14.6			18.0		J [8]	16.6		J [8]			

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   Y = analyte not detected at the reporting limit provided.
   The reporting limit is raised due to chromatographic interferences.
2. Validation qualifiers (Q2) are defined as follows:
   UY = material was not detected; raised reporting limit
   J = analyte positively identified; value is approximate concentration in sample.
3. Criteria obtained from Table 3 of Construction and Post-Construction Sediment Monitoring QAPP (AMEC et al. 2012g).
4. — = no carbon normalized value calculated due to carbon being outside the normal carbon normalization range of 0.5 to 4.0 percent
5. These samples were collected by the City of Seattle and reported analytes were determined by the City.
6. Split sample analyzed at this location
7. If 20% of total detected Aroclors are qualified as an estimated concentration the total calculated PCB concentration will also be considered to be estimated and will be assigned a "J" qualifier.
8. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier then the organic carbon normalized value will also be assigned a "J" qualifier.
   Organic Carbon Normalized PCB values will also be considered estimated if the TOC value is qualified as estimated.

APPENDIX E

CROWLEY SITE SAMPLE RESULT TABLES FROM SLR (2014a,b)



NOTES

1) CATCH BASINS AND CONVEYANCE LINES THAT ARE SHADED BLUE ARE REMOVED COMPONENTS OF THE PREVIOUS DRAINAGE SYSTEM THAT ARE SHOWN ON A LAYRITE CONCRETE PRODUCTS DRAWING TITLED "PLANT LAYOUT", DATED JUNE 1945, OR ON AN UNNAMED PRELIMINARY DRAWING DATED APPROXIMATELY 1990 THAT WAS IN CROWLEY MARITIME CORPORATION'S FILES.

2) CATCH BASINS AND CONVEYANCE LINES THAT ARE SHADED PURPLE ARE ABANDONED OR REMOVED COMPONENTS OF THE PREVIOUS DRAINAGE SYSTEM.

LEGEND

- PARCEL D/PARCEL F BOUNDARY
- PROPERTY BOUNDARIES
- RAIL LINE
- FENCE
- EXISTING STORM WATER CONVEYANCE LINE
- SEEP LOCATION
- INTERTIDAL SEDIMENT SAMPLE LOCATION
- DP2CB1 EXISTING STORM WATER CATCH BASIN LOCATION AND DESIGNATION
- DP1CB1 CURRENTLY CLOSED STORM WATER CATCH BASIN LOCATION AND DESIGNATION
- INACTIVE WASH WATER SUMP
- FORMER WASH WATER SUMP
- CONVEYANCE VAULT
- OF5 OUTFALL LOCATION AND DESIGNATION

8TH AVENUE TERMINALS, INC. SITE
7400 8TH AVENUE SOUTH
SEATTLE, WASHINGTON

Drawing: CURRENT STORM WATER DRAINAGE SYSTEM

Date: September 28, 2013	Scale: AS SHOWN	Fig. No. 3
File Name: 01-03	Project No. 101.00205.00030	

SLR
22118 20TH AVENUE SE
BLDG. G, SUITE 202
BOTHELL, WA 98201
T: 425-402-5800
F: 425-402-5806

N:\Bothell\1 PROJECTS\Crowley - 205\00030 First Phase of RIF\figures\01-03.dwg, Last Saved: September 28, 2013, MEH

integral consulting inc.

Figure E-1.
SLR (2014a) Site Diagram of Seep, Stormwater, Catch Basin Solids, and Intertidal Sediment Sample Locations, Crowley Site
Slip 4 Early Action Area
Long-Term Monitoring Data Report – Year 2 (2014)

SEEP SAMPLES

Table 9
Goundwater Sample Analytical Results - Total Metals
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Zinc (µg/L)	Total Suspended Solids (mg/L)
Preliminary Groundwater Cleanup Levels[a] (µg/L)			**3.87**	**0.87**	**122**	**4.0**	**0.25**	**50**	**2.4**	**0.54**	**0.0052**	**8.2**	**5.0**	**1.53**	**0.47**	**32.6**	**NV**
Preliminary Groundwater Screening Levels[b] (µg/L)			**3.87**	**0.87**	**2.0**	**4.0**	**0.25**	**50**	**2.4**	**0.54**	**0.0052**	**8.2**	**5.0**	**1.53**	**0.47**	**32.6**	**NV**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.052**	**0.15**	**0.25**	**0.098**	**0.094**	**0.14**	**0.34**	**0.14**	**0.00015**	**0.36**	**0.56**	**0.064**	**0.074**	**0.61**	**NV**
FMW-1	FMW-1	4/1/1990					U	5 U		U		U				17	
FMW-2	FMW-2	4/1/1990					U	11		U		U				4	
FMW-2	FMW2-090490	9/4/1990															
FMW-3	FMW-3	4/1/1990		U			U	5 U		U		U				7	
HC-1	HC1-WELL-111888	11/18/1988				1 U		1 U	2	U	U	2 U	5 U	1 U	U	28	
HC-1	HC1R-122888	12/28/1988		U													
HC-1	HC01-090490	9/4/1990															
HC-4	HC4-WELL-111888	11/18/1988	U	U		1 U	U	1		U	U	2		1 U	U	7	
HC-4	HC-4-092413	9/24/2013	1.25 U	0.47 IP		0.098 U	0.094 U	0.63	2.15	0.14 U	0.0015 U	4.31	0.85 IP	0.064 U	0.074 U	3.5	9.7 U
HC-20	HC-20-0713	7/11/2013	0.67			0.098 U	0.25 UJ	0.98	0.34 U	0.35	0.0011	2	0.56 U	0.064 U	0.074 U	9.81	11.2
HC-20	HC-20-092313	9/23/2013	1.25 U	IP		0.098 U	0.094 U	1.41	2 U	0.14 U	0.0015 U	1.35	0.56 U	0.064 U	0.074 U	7.63	10 U
HC-20	HC-20-100113	10/1/2013	0.34	IP		0.098 U	0.094 U	1.43	0.34 U	0.14 U	0.0015 U	1.07	0.56 U	0.064 U	0.074 U	4.24	9.7 U
MW-1 (1994)	MW1-070794	7/7/1994								U							
MW-2	MW2-070794	7/7/1994								U							
MW-3	MW3-070794	7/7/1994								U							
SLR-1	SLR1-082511	8/23/2011	0.30			0.29 U	0.25 U	1 U	1	0.34 U	0.004 U	4.06	U	0.22 U	0.21 U	1.36	
SLR-1	SLR-1-0713	7/11/2013	0.11			0.098 U	0.25 UJ	1.68	0.34 U	0.17	0.0012	1.39	0.56 U	0.064 U	0.074 U	0.61 U	10 U
SLR-1	SLR-1-092313	9/23/2013	1.93	IP		0.098 U	0.094 U	3.74			0.0046	3.2	0.56 U	0.064 U	0.074 U		10 U
SLR-1	SLR-1-100313	10/3/2013	0.14	IP		0.098 U	0.094 U	1.91	0.60	0.14 U	0.0015 U	1.36	0.83 IP	0.064 U	0.074 U	0.6 U	9.7 U
SLR-2	SLR2-082511	8/23/2011	0.30			0.29 U	0.25 U	1 U	0.75 U	0.34 U	0.004 U	2.54	U	0.22 U	0.21 U	2.72	
SLR-2	SLR-2-0713	7/11/2013	1.28	0.49		0.098 U	0.25 UJ	0.29	1.37	0.14 U	0.0012	1.64	0.56 U	0.064 U	0.074 U	1.87	10 U
SLR-2	SLR-2-092313	9/23/2013	2.49	IP		0.098 U	0.094 U	1.02	2.38	0.31	0.0018	1.92	0.56 U	0.064 U	0.074 U	4.35	10 U
SLR-2	SLR-2-100213	10/2/2013	2.2	IP		0.098 U	0.094 U	0.76		0.27	0.0034	1.57	0.94 IP	0.064 U	0.074 U	1.94	9.7 U
SLR-3	SLR3-082511	8/23/2011	0.72			0.29 U		29.1			0.004 U		U	0.22 U	0.21 U	8.22	
SLR-3	SLR-3-0713	7/12/2013	0.84			0.98 U		32			0.0043	5.29		0.64 U	0.074 U	6 U	10 U
SLR-3	SLR-3-092313	9/23/2013	1.25 U	IP		0.098 U		24	2 U		0.0022	3.51	IP	0.43	0.074 U	4.37	10 U
SLR-3	SLR-3-100313	10/3/2013	0.74	IP		0.20		27.6			0.004	3.6	IP	0.35	0.074 U	3.89	9.7 U
SLR-6	SLR6-082511	8/23/2011	0.65	0.74		0.29 U	0.25 U	1 U		0.34 U		3.13	U	0.22 U	0.21 U	3.86	
SLR-6	SLR-6-0713	7/12/2013	0.18	0.24		0.098 U	0.25 U	0.27	2.28	0.14 U	0.0015 U	1.47	0.56 U	0.064 U	0.074 U	2.08	10 U
SLR-6	SLR-6-092313	9/23/2013	1.25 U	0.25 IP		0.098 U	0.094 U	2.09	2 U	0.14 U	0.0015 U	2	0.56 U	0.064 U	0.074 U	2.5 U	10 U
SLR-6	SLR-6-100113	10/1/2013	0.76	IP		0.098 U	0.094 U	0.83				1.04	0.56 U	0.064 U	0.074 U	14.5	9.7 U
SLR-7	SLR7-082511	8/23/2011	0.18 U			0.29 U	0.25 U	1 U	0.75 U	0.34 U	0.004 U	6.74	U	0.22 U	0.21 U	4.83	
SLR-7	SLR-7-0713	7/11/2013	0.16			0.098 U	0.25 UJ	0.35	0.34 U	0.14 U	0.0015 U	3.69	0.56 U	0.064 U	0.074 U	0.96	10 U
SLR-7	SLR-7-092313	9/23/2013	1.25 U	IP		0.098 U	0.094 U	0.74	2 U	0.14 U	0.0015 U	3.7	0.56 U	0.064 U	0.074 U	2.5 U	16
SLR-7	SLR-7-100113	10/1/2013	0.11	IP		0.098 U	0.094 U	0.28	0.68	0.14 U	0.0015 U	3.29	0.56 U	0.064 U	0.074 U	5.95	9.7 U
Groundwater Seep Samples																	
Seep-1	Seep-1	7/24/2013	0.79			0.98 U	0.25 UJ	2.27		0.15 E	0.0025	6.86		0.064 UJ	0.074 UJ	15.4	10 U
Seep-2	Seep-2	7/24/2013	0.52 UJ			0.98 U	0.25 UJ	2.53		0.14 UJ	0.0015 U	7.24		0.064 UJ	0.074 UJ	12.3	10 U
Seep-3	Seep-3	7/24/2013	3.1			0.98 U	0.25 UJ	3.96		0.14 UJ	0.0026			0.064 UJ	0.074 UJ		10 U
Seep-4	Seep-4	7/23/2013	0.52 U			0.98 U	0.25 UJ	1.89		0.14 UJ	0.0016	6.02		0.064 UJ	0.074 UJ	7.39	10 U
Seep-5	Seep-5	7/23/2013	0.97			0.98 U	0.25 UJ	2.16		0.14 UJ	0.0023	5.85		0.064 UJ	0.074 UJ	10.8	10 U

Notes:

Values in bold and highlighted in orange exceed the preliminary groundwater cleanup levels at the groundwater compliance wells.
Detected values in bold and highlighted in yellow exceed the preliminary groundwater screening levels.
Non-detected valued highlighted in blue exceed the preliminary groundwater cleanup levels at the groundwater compliance wells.
Groundwater compliance wells are highlighted in green.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NA = Not analyzed
NV = No available value.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
IP = The laboratory report noted that compounds in the sample matrix interfered with the quantitation of the analyte.
[a] Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
[b] Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is higher.

Table 11
Groundwater Sample Analytical Results - PAHs
8th Avenue Terminals Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Anthracene (µg/L)	Benz[a]anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(ghi)perylene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenzo(a,h)anthracene (µg/L)	Fluoranthene (µg/L)	Fluorene (µg/L)	Indeno(1,2,3-cd)pyrene (µg/L)	Naphthalene (µg/L)	Phenanthrene (µg/L)	Pyrene (µg/L)
Preliminary Groundwater Cleanup Levels[a] (µg/L)			**2.61**	**10.8**	**10.8**	**0.0042**	**0.0078**	**0.0052**	**0.0044**	**0.0076**	**0.0038**	**0.0040**	**2.26**	**2.04**	**0.007**	**53.8**	**4.8**	**9.8**
Preliminary Groundwater Screening Levels[b] (µg/L)			**2.61**	**10.8**	**10.8**	**0.0042**	**0.0078**	**0.0052**	**0.0044**	**0.0076**	**0.0038**	**0.0040**	**2.26**	**2.04**	**0.007**	**53.8**	**4.8**	**9.8**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.0038**	**0.0025**	**0.0027**	**0.0042**	**0.0078**	**0.0052**	**0.0044**	**0.0076**	**0.0038**	**0.004**	**0.0046**	**0.004**	**0.007**	**0.004**	**0.0066**	**0.0036**
Groundwater Seep Samples																		
Seep-1	Seep-1	7/24/2013	0.0038 U	0.0024 U	0.0028 U	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038 U	0.004 U	0.0063	0.004 U	0.007 U	0.011	0.0092	0.0044
Seep-2	Seep-2	7/24/2013	0.0044	0.0024 U	0.0028 U	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038 U	0.004 U	0.0047	0.004 U	0.007 U	0.0046	0.0082	0.0036 U
Seep-3	Seep-3	7/24/2013	0.005	0.0024 U	0.0028 U	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038 U	0.004 U	0.0046 U	0.004 U	0.007 U	0.0048	0.0066 U	0.0036 U
Seep-4	Seep-4	7/23/2013	0.035	0.0024 U	0.0028 U		0.0078 U			0.0076 U		0.004 U	0.019	0.004 U		0.0051	0.011	0.021
Seep-5	Seep-5	7/23/2013	0.0038 U	0.0024 U	0.0028 U	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038 U	0.004 U	0.0046 U	0.004 U	0.007 U	0.0056	0.0067	0.0036 U

Notes:
Values in bold and highlighted in orange exceed the preliminary groundwater cleanup levels at the groundwater compliance wells
Detected values in bold and highlighted in yellow exceed the preliminary groundwater screening levels
Non-detected values highlighted in blue exceed the preliminary groundwater cleanup levels at the groundwater compliance wells
Groundwater compliance wells are highlighted in green
µg/L = micrograms per liter.
NA = Not analyzed.
ND = Analyte not detected; however, detection limit not available
U = The laboratory report noted that the analyte was not detected at or above the reported result
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range
[a] Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
[b] Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is highe

Table 12
Groundwater Sample Analytical Results - PCBs and Petroleum Hydrocarbons
8th Avenue Terminals, Inc. Site
Seattle, Washington

			PCBs							Petroleum Hydrocarbons			
Location	Sample ID	Sample Date	Aroclor 1016 (µg/L)	Aroclor 1221 (µg/L)	Aroclor 1232 (µg/L)	Aroclor 1242 (µg/L)	Aroclor 1248 (µg/L)	Aroclor 1254 (µg/L)	Aroclor 1260 (µg/L)	Gasoline Range Organics (µg/L)	Diesel Range Organics (µg/L)	Heavy Oil Range Organics (µg/L)	Total Petroleum Hydrocarbons (µg/L)
Preliminary Groundwater Cleanup Levels[a] (µg/L)			**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**800**	**500**	**500**	**500**
Preliminary Groundwater Screening Levels[b] (µg/L)			**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**800**	**500**	**500**	**500**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**12**	**6.9**	**52**	**52**
Groundwater Seep Samples													
Seep-1	Seep-1	7/24/2013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12	6.9	52	
Seep-2	Seep-2	7/24/2013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12	6.9	52	
Seep-3	Seep-3	7/24/2013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12	6.9	52	
Seep-4	Seep-4	7/23/2013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12	6.9	52	
Seep-5	Seep-5	7/23/2013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12	6.9	52	

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary groundwater screening levels.
Non-detected values highlighted in blue exceed the preliminary groundwater cleanup levels at the groundwater compliance wells
Groundwater compliance wells are highlighted in green.
µg/L = micrograms per liter.
NA = Not analyzed
ND = The laboratory report noted that the analyte not detected; however, detection limit not available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
[a] Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
[b] Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is higher.

Table 13
Groundwater Sample Analytical Results - Phenols
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	2,3,4,5-Tetrachlorophenol (µg/L)	2,3,4-Trichlorophenol (µg/L)	2,3,5,6-Tetrachlorophenol (µg/L)	2,3,6-Trichlorophenol (µg/L)	2,4,5-Trichlorophenol (µg/L)	2,4,6-Trichlorophenol (µg/L)	2,4-Dichlorophenol (µg/L)	2,4-Dimethylphenol (µg/L)	2,4-Dinitrophenol (µg/L)	2-Chlorophenol (µg/L)	2-Methylphenol (o-Cresol) (µg/L)	2-Nitrophenol (µg/L)	3,4,5-Trichlorophenol (µg/L)	3-Methylphenol and 4-Methylphenol coelution (µg/L)	4,6-Dinitro-2-Methylphenol (µg/L)	4-Chloro-3-methylphenol (µg/L)	4-Methylphenol (p-Cresol) (µg/L)	4-Nitrophenol (µg/L)	Pentachlorophenol (µg/L)	Phenol (µg/L)
Preliminary Groundwater Screening Levels[a] (µg/L)			**NV**	**NV**	**NV**	**NV**	**NV**	**0.56**	**NV**	**0.3**	**NV**	**NV**	**7.11**	**NV**	**NV**	**77.2**	**NV**	**NV**	**NV**	**NV**	**1.47**	**78.4**
Preliminary Groundwater Screening Levels[b] (µg/L)			**NV**	**NV**	**NV**	**NV**	**NV**	**0.56**	**NV**	**0.3**	**NV**	**NV**	**7.11**	**NV**	**NV**	**77.2**	**NV**	**NV**	**NV**	**NV**	**1.47**	**78.4**
2013 Practical Quantitation Limits (µg/L)			**NV**	**NV**	**NV**	**NV**	**0.22**	**0.28**	**NV**	**0.28**	**2.4**	**0.016**	**0.26**	**0.17**	**NV**	**0.41**	**0.38**	**0.24**	**NV**	**1.3**	**0.32**	**0.14**
EMW-10D	EMW-10D-0713	7/10/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 UJ	0.32 U	1.4 U
EMW-10D	EMW-56D-0713(dupl.)	7/10/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 UJ	0.32 U	1.4 U
EMW-10D	EMW-10D-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 UJ	0.24 U	NA	1.3 U	0.32 U	0.14 U
EMW-10D	EMW-56D-100113(dupl.)	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
EMW-11S	EMW-11S-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
EMW-11S	EMW-11S-093013	9/30/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 UJ	0.24 U	NA	1.3 U	0.32 U	0.38
EMW-12S	EMW-12S-0713	7/12/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 UJ	0.32 U	0.21
EMW-12S	EMW-12S-100313	10/3/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
EMW-13S	EMW-13S-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
EMW-13S	EMW-13S-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.57
EMW-14D	EMW-14D-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
EMW-14D	EMW-14D-093013	9/30/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
EMW-15D	EMW-15D-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
EMW-15D	EMW-15D-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
EMW-16D	EMW-16D-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
EMW-16D	EMW-16D-100213	10/2/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
FMW-1	FMW-1	4/27/1990	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA	5 U	ND
FMW-2	FMW-2	4/27/1990	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA	1.1 J	ND
FMW-3	FMW-3	4/27/1990	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA	8 U	ND
HC-1	HC1/WELL-111888	11/18/1988	NA	NA	NA	NA	4 U	4 U	4 U	2 U	20 U	2 U	2 U	4 U	NA	NA	20 U	4 U	2 U	20 U	20 U	2 U
HC-2	HC2/MWHC2-111788	11/17/1988	NA	NA	NA	NA	4 U	4 U	4 U	2 U	20 U	2 U	2 U	4 U	NA	NA	20 U	4 U	2 U	20 U	20 U	2 U
HC-4	HC4/WELL-111888	11/18/1988	NA	NA	NA	NA	4 U	4 U	4 U	2 U	20 U	2 U	2 U	4 U	NA	NA	20 U	4 U	2 U	20 U	20 U	2 U
HC-20	HC-20-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 UJ	0.32 U	1.4 U
HC-20	HC-20-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
MW-1 (1988)	MW-1-1	11/17/1988	NA	NA	NA	NA	4 U	4 U	4 U	2 U	20 U	2 U	2 U	4 U	NA	NA	20 U	4 U	2 U	20 U	20 U	2 U
SLR-1	SLR1-082511	8/23/2011	NA	NA	NA	NA	10 U	10 U	10 U	2.8 U	30 U	10 U	3.94 U	10 U	NA	8.01 U	30 U	10 U	NA	10 U	0.98 U	0.96 U
SLR-1	SLR-1-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
SLR-1	SLR-1-100313	10/3/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.23
SLR-2	SLR2-082511	8/23/2011	NA	NA	NA	NA	10 U	10 U	10 U	2.8 U	30 U	10 U	3.94 U	10 U	NA	8.01 U	30 U	10 U	NA	10 U	0.98 U	0.96 U
SLR-2	SLR-2-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
SLR-2	SLR-2-100213	10/2/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
SLR-3	SLR3-082511	8/23/2011	NA	NA	NA	NA	10 U	10 U	10 U	2.8 U	30 U	10 U	3.94 U	10 U	NA	8.01 U	30 U	10 U	NA	10 U	0.98 U	0.96 U
SLR-3	SLR-3-0713	7/12/2013	NA	NA	NA	NA	2.2 U	2.8 U	2.6 U	2.8 U	24 U	1.6 U	2.6 U	1.7 U	NA	4.2 U	3.8 U	2.4 U	NA	13 U	3.2 U	14 U
SLR-3	SLR-3-100313	10/3/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
SLR-6	SLR6-082511	8/23/2011	NA	NA	NA	NA	10 U	10 U	10 U	2.8 U	30 U	10 U	3.94 U	10 U	NA	8.01 U	30 U	10 U	NA	10 U	0.98 U	0.96 U
SLR-6	SLR-6-0713	7/12/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
SLR-6	SLR-6-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 UJ	0.24 U	NA	1.3 U	0.32 U	0.14
SLR-7	SLR7-082511	8/23/2011	NA	NA	NA	NA	10 U	10 U	10 U	2.8 U	30 U	10 U	3.94 U	10 U	NA	8.01 U	30 U	10 U	NA	10 U	0.98 U	0.96 U
SLR-7	SLR-7-0713	7/11/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.4 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	1.4 U
SLR-7	SLR-7-100113	10/1/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 U	2.4 U	0.16 U	NA	0.17 U	NA	0.42 U	0.38 UJ	0.24 U	NA	1.3 U	0.32 U	0.26
Groundwater Seep Samples																						
Seep-1	Seep-1	7/24/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
Seep-2	Seep-2	7/24/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
Seep-3	Seep-3	7/24/2013	NA	NA	NA	NA	2.2 U	2.8 U	2.6 U	2.8 UJ	24 U	1.6 U	2.6 U	1.7 U	NA	4.2 U	3.8 U	2.4 U	NA	13 U	3.2 U	1.4 U
Seep-4	Seep-4	7/23/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U
Seep-5	Seep-5	7/23/2013	NA	NA	NA	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	NA	0.42 U	0.38 U	0.24 U	NA	1.3 U	0.32 U	0.14 U

Notes:

Non-detected values highlighted in blue exceed the preliminary groundwater cleanup levels at the groundwater compliance wells.
Groundwater compliance wells are highlighted in green.
µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
ND = Analyte not detected; however,the detection limit is not available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
[a] Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
[b] Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is higher.

Table 14
Groundwater Sample Analytical Results - Phthalates
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Bis(2-ethylhexyl) phthalate (µg/L)	Butyl benzyl phthalate (µg/L)	Dibutyl phthalate (µg/L)	Diethyl phthalate (µg/L)	Dimethyl phthalate (µg/L)	Di-N-Octyl Phthalate (µg/L)
Preliminary Groundwater Cleanup Levels[a] (µg/L)			**1.2**	**0.41**	**46.6**	**484**	**143**	**0.3**
Preliminary Groundwater Screening Levels[b] (µg/L)			**1.2**	**0.41**	**46.6**	**484**	**143**	**0.3**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.17**	**0.086**	**0.068**	**0.06**	**0.05**	**0.044**
EMW-8S	EMW-8S-0713	7/12/2013	0.35 E	0.086 UJ	0.068 U	0.06 U	0.05 U	0.044 UJ
EMW-8S	EMW-8S-100313	10/3/2013	0.18	0.086 U	0.068 U	0.065	0.05 U	0.044 U
EMW-9S	EMW-9S-0713	7/12/2013	0.3 E	0.086 UJ	0.068 UJ	0.06 UJ	0.05 UJ	0.044 UJ
EMW-9S	EMW-9S-093013	9/30/2013	0.17 E	0.086 U	0.068 U	0.077	0.05 U	0.044 U
EMW-10D	EMW-10D-0713	7/10/2013	0.51 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-10D	EMW-56D-0713(dupl.)	7/10/2013	0.73 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-10D	EMW-10D-100113	10/1/2013	0.3 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-10D	EMW-56D-100113(dupl.)	10/1/2013	0.31 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-11S	EMW-11S-0713	7/11/2013	0.49 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-11S	EMW-11S-093013	9/30/2013	0.2 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-12S	EMW-12S-0713	7/12/2013	0.45 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-12S	EMW-12S-100313	10/3/2013	0.24 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-13S	EMW-13S-0713	7/11/2013	0.35 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-13S	EMW-13S-100113	10/1/2013	0.41 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-14D	EMW-14D-0713	7/11/2013	0.33 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 UJ
EMW-14D	EMW-14D-093013	9/30/2013	0.17 U	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-15D	EMW-15D-0713	7/11/2013	0.33 E	0.086 UJ	0.068 U	0.06 U	0.05 U	0.044 UJ
EMW-15D	EMW-15D-100113	10/1/2013	0.33 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
EMW-16D	EMW-16D-0713	7/11/2013	0.22 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 UJ
EMW-16D	EMW-16D-100213	10/2/2013	0.19 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
FMW-1	FMW-1	4/27/1990	29 B	ND U	ND U	ND U	ND U	ND U
FMW-2	FMW-2	4/27/1990	6.7 B	ND U	ND U	ND U	ND U	ND U
FMW-3	FMW-3	4/27/1990	17 B	ND U	ND U	ND U	ND U	ND U
HC-1	HC1/WELL-111888	11/18/1988	4 B	2 U	4 U	2 U	2 U	2 U
HC-2	HC2/MWHC2-111788	11/17/1988	5 B	2 U	4 U	2 U	2 U	2 U
HC-4	HC4/WELL-111888	11/18/1988	6 B	2 U	4 U	2 U	2 U	2 U
HC-20	HC-20-0713	7/11/2013	0.67 E	0.086 U	0.068 U	0.08 lc	0.05 U	0.044 U
HC-20	HC-20-100113	10/1/2013	0.4 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
MW-1 (1988)	MW-1-1	11/17/1988	47 B	2 U	4 U	2 U	2 U	2 U
SLR-1	SLR1-082511	8/23/2011	1.43 U	0.54 U	1 U	1 U	1 U	1 U
SLR-1	SLR-1-0713	7/11/2013	0.64 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
SLR-1	SLR-1-100313	10/3/2013	0.3 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
SLR-2	SLR2-082511	8/23/2011	1.43 U	0.54 U	1 U	1 U	1 U	1 U
SLR-2	SLR-2-0713	7/11/2013	0.53 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
SLR-2	SLR-2-100213	10/2/2013	0.23 B	0.086 U	0.068 U	0.14	0.05 U	0.044 U
SLR-3	SLR3-082511	8/23/2011	1.43 U	0.54 U	1 U	1 U	1 U	1 U
SLR-3	SLR-3-0713	7/12/2013	1.7 U	0.86 U	0.68 U	0.6 U	0.5 U	0.44 U
SLR-3	SLR-3-100313	10/3/2013	1 E	0.086 U	0.068 U	0.065	0.05 U	0.044 U
SLR-6	SLR6-082511	8/23/2011	1.43 U	0.54 U	1 U	1 U	1 U	1 U
SLR-6	SLR-6-0713	7/12/2013	0.82 E	0.086 U	0.068 U	0.17 lc	0.05 U	0.044 U
SLR-6	SLR-6-100113	10/1/2013	0.36 E	0.086 U	0.068 U	0.13	0.05 U	0.044 U
SLR-7	SLR7-082511	8/23/2011	1.43 U	0.54 U	1 U	1 U	1 U	1 U
SLR-7	SLR-7-0713	7/11/2013	0.31 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
SLR-7	SLR-7-100113	10/1/2013	0.31 B	0.086 UJ	0.068 U	0.06 U	0.05 U	0.044 UJ
Groundwater Seep Samples								
Seep-1	Seep-1	7/24/2013	1.2 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
Seep-2	Seep-2	7/24/2013	0.28 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 UJ
Seep-3	Seep-3	7/24/2013	1.7 U	0.86 U	0.68 U	0.6 U	0.5 U	0.44 U
Seep-4	Seep-4	7/23/2013	0.51 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
Seep-5	Seep-5	7/23/2013	0.55 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U

Table 15
Groundwater Sample Analytical Results - SVOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,2,4-Trichlorobenzene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	2,4-Dinitrotoluene (µg/L)	2,6-Dinitrotoluene (µg/L)	2-Chloronaphthalene (µg/L)	2-Methylnaphthalene (µg/L)	2-Nitroaniline (µg/L)	3,3-Dichlorobenzidine (µg/L)	4-Bromophenyl phenyl ether (µg/L)	4-Chloroaniline (µg/L)	4-Chlorophenyl-Phenylether (µg/L)	4-Nitroaniline (µg/L)	Benzoic acid (µg/L)	Benzyl Alcohol (µg/L)	Bis(2-chloroethoxy) methane (µg/L)	Bis(2-Chloroethyl) Ether (µg/L)	Bis(2-chloroisopropyl) ether (µg/L)	Carbazole (µg/L)	Dibenzofuran (µg/L)	Hexachlorobenzene (µg/L)	Hexachlorobutadiene (µg/L)	Hexachlorocyclopentadiene (µg/L)	Hexachloroethane (µg/L)	Isophorone (µg/L)	m-Nitroaniline (µg/L)	Nitrobenzene (µg/L)	N-Nitrosodi-n-propylamine (µg/L)	N-Nitrosodi -phenylamine (µg/L)
Preliminary Groundwater Cleanup Levels[a] (µg/L)			**1.13**	**5.19**	**600**	**1.7**	**NV**	**NV**	**NV**	**18.2**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**2,243**	**182**	**NV**	**NV**	**NV**	**NV**	**1.3**	**0.05**	**0.9**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**1.38**
Preliminary Groundwater Screening Levels[b] (µg/L)			**1.13**	**5.19**	**600**	**1.7**	**NV**	**NV**	**NV**	**18.2**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**2,243**	**182**	**NV**	**NV**	**NV**	**NV**	**1.3**	**0.05**	**0.9**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**1.38**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.05**	**0.024**	**0.034**	**0.034**	**0.056**	**0.062**	**0.044**	**0.034**	**0.086**	**0.807**	**0.056**	**0.056**	**0.072**	**0.56**	**14**	**0.4**	**0.034**	**0.06**	**0.03**	**0.048**	**0.034**	**0.05**	**0.07**	**0.094**	**0.06**	**0.03**	**0.46**	**0.044**	**0.11**	**0.05**
SLR-1	SLR1-082511	8/23/2011	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.014	1 U	NA	1 U	3 U	1 U	10 U	94.5 U	10 U	1 U	10 U	10 U	0.048 U	0.034 U	1 U	1 U	0.094 U	0.06 U	0.03 U	0.46 U	1 U	10 U	1 U
SLR-1	SLR-1-0713	7/11/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	1 U	1 U	0.05 U	0.07 U	3 U	1 U	1 U	3 U	0.044 U	0.11 U	0.05 U
SLR-1	SLR-1-100313	10/3/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U	0.26 U	0.044 U
SLR-2	SLR2-082511	8/23/2011	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.009 U	1 U	NA	1 U	3 U	1 U	10 U	94.5 U	10 U	1 U	10 U	10 U	0.048 U	0.034 U	1 U	1 U	0.094 U	0.06 U	0.03 U	0.46 U	1 U	10 U	1 U
SLR-2	SLR-2-100213	10/2/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U	0.26 U	0.044 U
SLR-2	SLR-2-0713	7/11/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	1 U	1 U	0.05 U	0.07 U	3 U	1 U	1 U	3 U	0.044 U	0.11 U	0.05 U
SLR-3	SLR3-082511	8/23/2011	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.067	1 U	NA	1 U	3 U	1 U	10 U	94.5 U	10 U	1 U	10 U	10 U	0.48 U	0.34 U	1 U	1 U	0.94 U	0.6 U	0.3 U	4.6 U	1 U	10 U	1 U
SLR-3	SLR-3-100313	10/3/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U	0.26 U	0.044 U
SLR-3	SLR-3-0713	7/12/2013	0.5 U	0.24 U	0.34 U	0.34 U	0.56 U	0.62 U	0.44 U	0.34 U	0.86 U	NA	0.56 U	0.56 UJ	0.72 U	5.6 U	140 U	4 U	0.34 U	0.6 U	0.3 U	1 U	1 U	0.5 U	0.7 U	3 U	1 U	1 U	3 U	0.44 U	1.1 U	0.5 U
SLR-6	SLR6-082511	8/23/2011	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.012	1 U	NA	1 U	3 U	1 U	10 U	94.5 U	10 U	1 U	10 U	10 U	0.048 U	0.034 U	1 U	1 U	0.094 U	0.06 U	0.03 U	0.46 U	1 U	10 U	1 U
SLR-6	SLR-6-0713	7/12/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 UJ	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	1 U	1 U	0.05 U	0.07 U	3 U	1 U	1 U	3 U	0.044 U	0.11 U	0.05 U
SLR-6	SLR-6-100113	10/1/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U	0.26 U	0.044 U
SLR-7	SLR7-082511	8/23/2011	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.091	1 U	NA	1 U	3 U	1 U	10 U	94.5 U	10 U	1 U	10 U	10 U	0.048 U	0.034 U	1 U	1 U	0.094 U	0.06 U	0.03 U	0.46 U	1 U	10 U	1 U
SLR-7	SLR-7-0713	7/11/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 UJ	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	1 U	1 U	0.05 U	0.07 U	3 U	1 U	1 U	3 U	0.044 U	0.11 U	0.05 U
SLR-7	SLR-7-100113	10/1/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U	0.26 U	0.044 U
Groundwater Seep Samples																																
Seep-1	Seep-1	7/24/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
Seep-2	Seep-2	7/24/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
Seep-3	Seep-3	7/24/2013	0.5 U	0.24 U	0.34 U	0.34 U	0.56 U	0.62 U	0.44 U	0.34 U	0.86 U	NA	0.56 U	0.56 U	0.72 U	5.6 U	140 U	4 U	0.34 U	0.6 U	0.3 U	0.48 U	0.34 U	0.5 U	0.7 U	0.94 U	0.6 U	0.3 U	4.6 U	0.44 U	1.1 U	0.5 U
Seep-4	Seep-4	7/23/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
Seep-5	Seep-5	7/23/2013	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	NA	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U

Notes:

Detected values in bold and highlighted in orange exceed the preliminary groundwater cleanup levels at the groundwater compliance wells
Detected values in bold and highlighted in yellow exceed the preliminary groundwater screening levels
Non-detected values highlighted in blue exceed the preliminary groundwater cleanup levels at the groundwater compliance wells
Groundwater compliance wells are highlighted in green
µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
NR = Not recorded
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
[b] Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is higher.

Table 16
Groundwater Sample Analytical Results - VOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,1,1,2-Tetrachloroethane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,1-Dichloropropene (µg/L)	1,2,3-Trichlorobenzene (µg/L)	1,2,3-Trichloropropane (µg/L)	1,2,4-Trichlorobenzene (µg/L)	1,2,4-Trimethylbenzene (µg/L)	1,2-Dibromo-3-Chloropropane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,3,5-Trimethylbenzene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,3-Dichloropropane (µg/L)	1,4-Dichlorobenzene (µg/L)	2,2-Dichloropropane (µg/L)	2-Chlorotoluene (µg/L)	2-Hexanone (µg/L)	4-Chlorotoluene (µg/L)	Acetone (µg/L)	Benzene (µg/L)	Bromobenzene (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)	Carbon Disulfide (µg/L)	Carbon Tetrachloride (µg/L)	CFC-11 (µg/L)	CFC-113 (µg/L)	CFC-12 (µg/L)	Chloroethane (µg/L)	Chlorodibromomethane (µg/L)	Chloromethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Cis-1,3-Dichloroethene (µg/L)	Cis-1,3-Dichloropropene (µg/L)	Cumene (µg/L)	Dibromomethane (µg/L)	Dichlorobromomethane (µg/L)	Ethylbenzene (µg/L)	Ethylene dibromide (µg/L)	Hexachlorobutadiene (µg/L)	Methyl ethyl ketone (µg/L)	Methyl isobutyl ketone (µg/L)	Methyl t-butyl ether (µg/L)	Methylene Chloride (µg/L)	Naphthalene (µg/L)	n-Propylbenzene (µg/L)	o-Isopropyltoluene (µg/L)	Sec-Butylbenzene (µg/L)	Styrene (µg/L)	Tert-Butylbenzene (µg/L)	Tetrachloroethene (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)	Trans-1,3-Dichloroethene (µg/L)	Trans-1,3-Dichloropropene (µg/L)	Trichloroethene (µg/L)	Vinyl Acetate (µg/L)	Vinyl Chloride (µg/L)
Preliminary Groundwater Cleanup Levels* (µg/L)			**NV**	**200**	**0.33**	**0.77**	**1**	**0.73**	**NV**	**NV**	**NV**	**1.13**	**303**	**NV**	**5.19**	**0.48**	**3.7**	**45.2**	**600**	**NV**	**4**	**NV**	**NV**	**NV**	**2,600**	**6,000**	**1.2**	**NV**	**140**	**NV**	**NV**	**0.46**	**NV**	**NV**	**NV**	**20**	**NV**	**0.24**	**4.3**	**18.9**	**130**	**NV**	**NV**	**NV**	**17**	**1.7**	**NV**	**0.9**	**4,800**	**640**	**NV**	**5**	**53.8**	**NV**	**NV**	**NV**	**100**	**NV**	**0.28**	**1,000**	**1,000**	**NV**	**NV**	**0.49**	**NV**	**0.13**
Preliminary Groundwater Screening Levels* (µg/L)			**NV**	**200**	**0.33**	**0.77**	**1**	**0.73**	**NV**	**NV**	**NV**	**1.13**	**303**	**NV**	**5.19**	**0.48**	**3.7**	**45.2**	**600**	**NV**	**4**	**NV**	**NV**	**NV**	**2,600**	**6,000**	**1.2**	**NV**	**140**	**NV**	**NV**	**0.46**	**NV**	**NV**	**NV**	**20**	**NV**	**0.24**	**4.3**	**18.9**	**130**	**NV**	**NV**	**NV**	**17**	**1.7**	**NV**	**0.9**	**4,800**	**640**	**NV**	**5**	**53.8**	**NV**	**NV**	**NV**	**100**	**NV**	**0.28**	**1,000**	**1,000**	**NV**	**NV**	**0.49**	**NV**	**0.13**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.32**	**0.2**	**0.24**	**0.28**	**0.18**	**0.19**	**0.26**	**0.38**	**0.28**	**0.34**	**0.11**	**0.44**	**0.13**	**0.11**	**0.32**	**0.18**	**0.15**	**0.2**	**0.09**	**0.3**	**0.13**	**1**	**0.16**	**2.6**	**0.13**	**0.18**	**0.22**	**0.2**	**NV**	**0.24**	**0.17**	**NV**	**0.16**	**0.1**	**0.24**	**0.18**	**0.24**	**0.22**	**0.24**	**0.2**	**NV**	**0.28**	**0.38**	**0.16**	**0.24**	**0.46**	**0.94**	**1.3**	**0.13**	**3**	**0.004**	**0.14**	**0.15**	**0.12**	**0.22**	**0.15**	**0.28**	**0.13**	**0.72**	**0.24**	**0.34**	**0.17**	**NV**	**0.13**
Groundwater Samples (continued)																																																																										
SLR-2	SLR2-082511	8/23/2011	1 U	0.58 U	1 U	0.57 U	0.6 U	0.36 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	5.6	0.35 U	1 U	1 U	1 U	NA	0.7 U	1 U	NA	10 U	0.3 U	1 U	1 U	0.4 U	0.8 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	10 U	10 U	1 U	4.7 U	1 U	1 U	1 U	1 U	0.32 U	1 U	0.23 U	0.35 U	0.14 U	1 U	1 U	0.58 U	NA	0.36 U
SLR-2	**SLR-2-0713**	**7/11/2013**	**0.32 U**	**0.2 U**	**0.24 U**	**0.28 U**	**0.18 U**	**0.19 U**	**0.26 U**	**0.38 U**	**0.28 U**	**0.34 U**	**0.11 U**	**0.44 U**	**0.13 U**	**0.11 U**	**0.32 U**	**0.18 U**	**0.15 U**	**0.2 U**	**0.09 UJ**	**0.3 U**	**0.13 U**	**1 U**	**0.16 U**	**2.6 U**	**0.13 U**	**0.18 U**	**0.22 U**	**0.2 UJ**	**NA**	**0.24 U**	**0.17 U**	**NA**	**0.16 U**	**0.1 U**	**0.24 U**	**0.18 U**	**0.24 U**	**0.22 U**	**0.24 U**	**0.2 U**	**0.15 U**	**0.28 U**	**0.38 U**	**0.16 U**	**0.24 U**	**0.46 U**	**0.94 UJ**	**1.3 U**	**0.13 U**	**3 U**	**0.28 U**	**0.14 U**	**0.15 U**	**0.12 U**	**0.22 U**	**0.15 U**	**0.28 U**	**0.13 U**	**0.22 U**	**0.24 U**	**0.34 U**	**0.17 U**	**NA**	**0.13 U**
SLR-2	SLR-2-100213	10/2/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 UJ	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-3	SLR3-082511	8/23/2011	1 U	0.58 U	1 U	0.57 U	0.6 U	0.36 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	15	0.35 U	1 U	1 U	1 U	NA	0.7 U	1 U	NA	10 U	0.3 U	1 U	1 U	0.4 U	0.8 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	10 U	10 U	1 U	4.7 U	1 U	1 U	1 U	1 U	0.32 U	1 U	0.23 U	0.35 U	0.14 U	1 U	1 U	0.58 U	NA	0.36 U
SLR-3	SLR-3-0713	7/12/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 UJ	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-3	SLR-3-100313	10/3/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 UJ	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-6	SLR6-082511	8/23/2011	1 U	0.58 U	1 U	0.57 U	0.6 U	0.36 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	5.5 U	0.35 U	1 U	1 U	1 U	NA	0.7 U	1 U	NA	10 U	0.3 U	1 U	1 U	0.4 U	0.8 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	10 U	10 U	1 U	4.7 U	1 U	1 U	1 U	1 U	0.32 U	1 U	0.23 U	0.35 U	0.14 U	1 U	1 U	0.58 U	NA	0.36 U
SLR-6	SLR-6-0713	7/12/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 UJ	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	**1.3**	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-6	SLR-6-100113	10/1/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 UJ	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-7	**SLR7-082511**	**8/23/2011**	**1 U**	**0.58 U**	**1 U**	**0.57 U**	**0.6 U**	**0.36 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**10 U**	**1 U**	**0.5 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**10 U**	**1 U**	**14**	**0.35 U**	**1 U**	**1 U**	**1 U**	**NA**	**0.7 U**	**1 U**	**NA**	**10 U**	**0.3 U**	**1 U**	**1 U**	**0.4 U**	**0.8 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**0.2 U**	**1 U**	**1 U**	**10 U**	**10 U**	**1 U**	**4.7 U**	**1 U**	**1 U**	**1 U**	**1 U**	**0.32 U**	**1 U**	**0.23 U**	**0.35 U**	**0.14 U**	**1 U**	**1 U**	**0.58 U**	**NA**	**0.36 U**
SLR-7	SLR-7-0713	7/11/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
SLR-7	SLR-7-100113	10/1/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 UJ	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
Groundwater Seep Samples																																																																										
Seep-1	Seep-1	7/24/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
Seep-2	Seep-2	7/24/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
Seep-3	Seep-3	7/24/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	0.13 U
Seep-4	Seep-4	7/23/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.09 UJ	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 UJ	NA	0.24 U	0.17 U	NA	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	NA	**0.15**
Seep-5	**Seep-5**	**7/23/2013**	**0.32 U**	**0.2 U**	**0.24 U**	**0.28 U**	**0.18 U**	**0.19 U**	**0.26 U**	**0.38 U**	**0.28 U**	**0.34 U**	**0.11 U**	**0.44 U**	**0.13 U**	**0.11 U**	**0.32 U**	**0.18 U**	**0.15 U**	**0.2 U**	**0.09 UJ**	**0.3 U**	**0.13 U**	**1 U**	**0.16 U**	**2.6 U**	**0.13 U**	**0.18 U**	**0.22 U**	**0.2 UJ**	**NA**	**0.24 U**	**0.17 U**	**NA**	**0.16 U**	**0.1 U**	**0.24 U**	**0.18 U**	**0.24 U**	**0.22 U**	**0.24 U**	**0.2 U**	**0.15 U**	**0.28 U**	**0.38 U**	**0.16 U**	**0.24 U**	**0.46 U**	**0.94 U**	**1.3 U**	**0.13 U**	**3 U**	**0.28 U**	**0.14 U**	**0.15 U**	**0.12 U**	**0.22 U**	**0.15 U**	**0.28 U**	**0.13 U**	**0.22 U**	**0.24 U**	**0.34 U**	**0.17 U**	**NA**	**0.13 U**

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary groundwater screening levels.
Non-detected values highlighted in blue exceed the preliminary groundwater cleanup levels in the groundwater compliance wells.
Results that exceed the screening levels due to possible interference from laboratory contamination are highlighted in purple.
Groundwater compliance wells are highlighted in green.
µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
E = The laboratory report noted that the reported results is an estimate because it exceeds calibration range.
J = The laboratory report noted that the analyte was positively identified and reported result is an estimate.
Ic = The laboratory report noted that the presence of the compound indicated is likely due to laboratory contamination.
* Preliminary cleanup levels are based on the most stringent ARAR that applies to the site conditions, the background concentration (if available), or the practical quantitation limit (PQL), whichever is higher.
* Preliminary screening levels are based on the most stringent potential ARARs for the site, the background concentration (if available), or the PQL, whichever is higher.

STORMWATER SAMPLES

Table 25
Storm Water Sample Analytical Results - Total Metals
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Zinc (µg/L)	Total Suspended Solids (mg/L)	Chloride (mg/L)	Total Organic Carbon (mg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**3.87**	**5**	**2**	**4**	**15.9**	**50**	**2.4**	**2.5**	**0.012**	**8.2**	**5**	**22**	**0.47**	**56**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.052**	**0.15**	**0.25**	**0.098**	**0.094**	**0.14**	**0.34**	**0.144**	**0.00015**	**0.36**	**0.56**	**0.064**	**0.074**	**0.61**	**NV**	**NV**	**NV**
OF1	OF-1-062613	6/26/2013	1.04	1.33		0.098 U	0.15	2.2		2.43	0.0065	2.31	0.56 U	0.064 U	0.074 UJ		24	2.2	11.3
OF1	OF1-022014	2/20/2014	0.591	0.615		0.098 U	0.094 U	1.18		1.5	0.0042	1.1	0.922	0.064 U	0.074 U		9.7 U	27.7	5.09
OF2	OF-2-062613	6/26/2013	1.52	2.31		0.098 U	0.20	4.16			0.01	3.87	0.56 U	0.064 U	0.074 UJ		23	4.9	19.2
OF2	OF2-022014	2/20/2014	0.52 U	0.454		0.098 U	0.094 U	0.667	U	0.609	0.0033	0.46 U	0.707	0.064 U	0.074 U	9.37	9.7 U	3.7	1.82
OF2	OF9-022014 (dupl.)	2/20/2014	0.52 U	0.445		0.098 U	0.094 U	0.607	U	0.525	0.0028	0.46 U	0.766	0.064 U	0.074 U	8.63	9.7 U	3.6	1.5 U
OF3	OF-3-062613	6/26/2013	1.14	3.13		0.098 U	0.39	3.56			0.012	4.69	0.56 U	0.064 U	0.074 UJ		20	15	22.8
OF3	OF3-022014	2/20/2014	1.4			0.098 U	0.444	6.68					1.84	0.064 U	0.074 U		57	172	112
OF4	OF-4-062613	6/26/2013	1.55	2.28		0.098 U	0.25	3.76				3.3	0.56 U	0.064 U	0.074 UJ		10	4.8	10.7
OF4	OF4-022014	2/20/2014	1.22			0.098 U	0.436	6.46					2.41	0.064 U	0.074 U		38	291	177
OF5	OF-5-062613	6/26/2013	0.93	1.23		0.098 U	0.24	2.12			0.006	3.05	0.56 U	0.064 U	0.074 UJ		10 U	3.1	10.8
OF5	OF5-022014	2/20/2014	0.52 U	0.908		0.098 U	0.111	1.64		1.58	0.0041	2.54	0.697	0.064 U	0.074 U		9.7 U	5.4	4.74
OF6	OF-6-062613	6/26/2013	1.71	2.15		0.098 U	0.16	2.39			0.0051	2.09	0.56 U	0.064 U	0.074 UJ		12	37	7.33
OF6	OF6-022014	2/20/2014	1.15	1.46		0.098 U	0.119	1.3			0.01	1.12	1.35	0.064 U	0.074 U		9.7 U	64.9	4.34

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary storm water screening levels.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NV = No available value.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher. However, if there is an ARAR for surface water discharge (NPDES), then the NPDES value was selected as the storm water screening level.

Table 26
Storm Water Sample Analytical Results - PAHs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Anthracene (µg/L)	Benz[a]anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(ghi)perylene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenzo(a,h)anthracene (µg/L)	Fluoranthene (µg/L)	Fluorene (µg/L)	Indeno(1,2,3-cd)pyrene (µg/L)	Naphthalene (µg/L)	Phenanthrene (µg/L)	Pyrene (µg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**643**	**10.8**	**2,400**	**0.0042**	**0.0078**	**0.0052**	**0.0044**	**0.0076**	**0.0038**	**0.004**	**90.2**	**640**	**0.007**	**160**	**4.8**	**9.8**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.0038**	**0.0024**	**0.0027**	**0.0042**	**0.0078**	**0.0052**	**0.0044**	**0.0076**	**0.0038**	**0.004**	**0.0047**	**0.004**	**0.007**	**0.004**	**0.0066**	**0.0037**
OF1	OF-1-062613	6/26/2013	0.0038 U	0.0024 U	0.0029	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U		0.004 U	0.015	0.004 U	0.007 U	0.0045	0.0075	0.0077
OF1	OF1-022014	2/20/2014	0.0038 U	0.0024 UJ	0.0028 U	0.0042 UJ	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038	0.004 U	0.011	0.004 U	0.007 U	0.0091	0.012	0.012
OF2	OF-2-062613	6/26/2013	0.0038 U	0.0024 U	0.0054		0.0078 U		0.0044 U	0.0076 U		0.004 U	0.019	0.004 U	0.007 U	0.004 U	0.0075	0.025
OF2	OF2-022014	2/20/2014	0.0038 U	0.0024 UJ	0.0028 U	0.0042 UJ	0.0078 U	0.0052 U	0.0044 U	0.0076 U		0.004 U	0.013	0.004 U	0.007 U	0.011	0.014	0.014
OF2	OF9-022014	2/20/2014	0.0038 U	0.0024 UJ	0.0028 U	0.0042 UJ	0.0078 U	0.0052 U	0.0044 U	0.0076 U		0.004 U	0.011	0.004 U	0.007 U	0.0079	0.013	0.011
OF3	OF-3-062613	6/26/2013	0.0038 U	0.0024 U	0.0045	E	0.0078 UJ	E	0.0044 UJ	0.0076 UJ	E	0.004 UJ	0.014	0.004 U	0.007 UJ	0.004	0.0083	0.019
OF3	OF3-022014	2/20/2014	0.0038 U	0.0024 UJ	0.0028 U							0.004 U	0.094	0.013	E	0.03	0.069	0.1
OF4	OF-4-062613	6/26/2013	0.0038 U	0.0024 U	0.003	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U	0.0038 U	0.004 U	0.007	0.004 U	0.007 U	0.004 U	0.0066 U	0.0054
OF4	OF4-022014	2/20/2014	0.0038 U	0.0024 UJ	0.0094		0.0078 U			0.0076 U		0.004 U	0.03	0.004 U	E	0.004 U	0.025	0.032
OF5	OF-5-062613	6/26/2013	0.0038 U	0.0024 U	0.013	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U		0.004 U	0.014	0.004 U	0.007 U	0.004 U	0.011	0.02
OF5	OF5-022014	2/20/2014	0.0051	0.0024 UJ	0.0028 U	0.0042 UJ	0.0078 U		0.0044 U	0.0076 U		0.004 U	0.023	0.0055	0.007 U	0.0054	0.011	0.037
OF6	OF-6-062613	6/26/2013	0.0038 U	0.0024 U	0.003	0.0042 U	0.0078 U	0.0052 U	0.0044 U	0.0076 U		0.004 U	0.0077	0.004 U	0.007 U	0.0045	0.0066 U	0.008
OF6	OF6-022014	2/20/2014	0.0096	0.0024 UJ	0.0064	E	0.0078 U		0.0044 U	0.0076 U		0.004 U	0.042	0.0057	0.007 U	0.01	0.026	0.041

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary storm water screening levels.

µg/L = micrograms per liter

U = The laboratory report noted that the analyte was not detected at or above the reported result.

UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.

E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.

[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher. However, if there is an ARAR for surface water discharge (NPDES), then the NPDES value was selected as the stormwater screening level.

Table 27
Storm Water Sample Analytical Results - PCBs and Petroleum Hydrocarbons
8th Avenue Terminals, Inc. Site
Seattle, Washington

			PCBs							Petroleum Hydrocarbons		
Location	Sample ID	Sample Date	Aroclor 1016 (µg/L)	Aroclor 1221 (µg/L)	Aroclor 1232 (µg/L)	Aroclor 1242 (µg/L)	Aroclor 1248 (µg/L)	Aroclor 1254 (µg/L)	Aroclor 1260 (µg/L)	Gasoline Range Organics (µg/L)	Diesel Range Organics (µg/L)	Heavy Oil Range Organics (µg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**800**	**500**	**500**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**12**	**6.9**	**52**
OF1	OF-1-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	18	120
OF1	OF1022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	17	100
OF2	OF-2-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	420	**1,400**
OF2	OF2022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	66	240
OF2	OF9022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	76	340
OF3	OF-3-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	63	**510**
OF3	OF3022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	79	380
OF4	OF-4-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	26	130
OF4	OF4022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	13	22	160
OF5	OF-5-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	27	190
OF5	OF5022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	21	66
OF6	OF-6-062613	6/26/2013	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	43	240
OF6	OF6022014	2/20/2014	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	12 U	20	110

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary storm water screening levels.

µg/L = micrograms per liter.

NA = Not analyzed

U = The laboratory report noted that the analyte was not detected at or above the reported result.

UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.

[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher. However, if there is an ARAR for surface water discharge (NPDES), then the NPDES value was selected as the storm water screening level.

Table 28
Storm Water Sample Analytical Results - Phenols
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	2,3,4,5-Tetrachlorophenol (µg/L)	2,4,5-Trichlorophenol (µg/L)	2,4,6-Trichlorophenol (µg/L)	2,4-Dichlorophenol (µg/L)	2,4-Dimethylphenol (µg/L)	2,4-Dinitrophenol (µg/L)	2-Chlorophenol (µg/L)	(2-Methylphenol)o-Cresol (µg/L)	2-Nitrophenol (µg/L)	3-Methylphenol and 4-Methylphenol coelution (µg/L)	4,6-Dinitro-2-Methylphenol (µg/L)	4-Chloro-3-methylphenol (µg/L)	4-Nitrophenol (µg/L)	Pentachlorophenol (µg/L)	Phenol (µg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**NV**	**NV**	**0.56**	**NV**	**0.3**	**NV**	**NV**	**7.11**	**NV**	**77.2**	**NV**	**NV**	**NV**	**1.47**	**78.4**
2013 Laboratory Practical Quantitation Limits (µg/L)			**NV**	**0.22**	**0.28**	**NV**	**0.28**	**2.4**	**0.016**	**0.26**	**0.17**	**0.4**	**0.38**	**0.24**	**1.3**	**0.32**	**0.14**
OF1	OF-1-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF1	OF1-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF2	OF-2-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF2	OF2-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF2	OF9-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF3	OF-3-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF3	OF3-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF4	OF-4-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF4	OF4-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF5	OF-5-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF5	OF5-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF6	OF-6-062613	6/26/2013	NA	0.22 U	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U
OF6	OF6-022014	2/20/2014	0.22 U	NA	0.28 U	0.26 U	0.28 UJ	2.4 U	0.16 U	0.26 U	0.17 U	0.4 U	0.38 U	0.24 U	1.3 U	0.32 U	0.14 U

Notes:

µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 29
Storm Water Sample and Analytical Results - Phthalates
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Bis(2-ethylhexyl) phthalate (µg/L)	Butyl benzyl phthalate (µg/L)	Dibutyl phthalate (µg/L)	Diethyl phthalate (µg/L)	Dimethyl phthalate (µg/L)	Di-n-octyl phthalate (µg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**1.2**	**0.41**	**46.6**	**484**	**143**	**0.3**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.17**	**0.086**	**0.068**	**0.06**	**0.05**	**0.044**
OF1	OF-1-062613	6/26/2013	**1.4** E	0.086 UJ	0.068 U	0.27 E	0.3	0.044 U
OF1	OF1-022014	2/20/2014	0.78 E	0.086 U	0.29	0.06 U	0.05 U	0.22
OF2	OF-2-062613	6/26/2013	**8.3** E	0.086 U	0.068 U	0.25 E	0.28	0.21 E
OF2	OF2-022014	2/20/2014	1.2 E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
OF2	OF9-022014	2/20/2014	**1.6** E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
OF3	OF-3-062613	6/26/2013	**3.6** E	0.086 U	0.068 U	0.77 E	0.08	0.14 E
OF3	OF3-022014	2/20/2014	**3.1** E	0.086 U	0.11	0.13	0.077	0.1
OF4	OF-4-062613	6/26/2013	**2.8** E	0.18	0.068 U	0.22 E	0.05 U	0.044 U
OF4	OF4-022014	2/20/2014	**3.3** E	0.086 U	0.068 U	0.06 U	0.05 U	0.044 U
OF5	OF-5-062613	6/26/2013	1 E	0.086 U	0.07	0.22 E	0.077	0.044 U
OF5	OF5-022014	2/20/2014	0.64 E	0.086 U	0.068 U	0.07	0.05 U	0.052
OF6	OF-6-062613	6/26/2013	**2.3** E	0.1	0.068 U	0.17 E	0.075	0.11 E
OF6	OF6-022014	2/20/2014	1 E	0.086 U	0.068 U	0.1	0.05 U	0.044 U

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary storm water screening levels.
µg/L = micrograms per liter.
NA = Not analyzed
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 30
Storm Water Sample Sample Analytical Results - SVOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,2,4-Trichlorobenzene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	2,4-Dinitrotoluene (µg/L)	2,6-Dinitrotoluene (µg/L)	2-Chloronaphthalene (µg/L)	2-Methylnaphthalene (µg/L)	2-Nitroaniline (µg/L)	4-Bromophenyl phenyl ether (µg/L)	4-Chloroaniline (µg/L)	4-Chlorophenyl-Phenylether (µg/L)	4-Nitroaniline (µg/L)	Benzoic acid (µg/L)	Benzyl alcohol (µg/L)	Bis(2-chloroethoxy)methane (µg/L)	Bis(2-Chloroethyl)Ether (µg/L)	Bis(2-chloroisopropyl) ether (µg/L)	Carbazole (µg/L)	Dibenzofuran (µg/L)	Hexachlorobenzene (µg/L)	Hexachlorobutadiene (µg/L)	Hexachlorocyclopentadiene (µg/L)	Hexachloroethane (µg/L)	Isophorone (µg/L)	m-Nitroaniline (µg/L)	Nitrobenzene (µg/L)	N-Nitrosodi-n-propylamine (µg/L)	N-Nitrosodiphenylamine (µg/L)
Preliminary Storm Water Screening Levels[a] (µg/L)			**1.13**	**5.19**	**600**	**1.7**	**NV**	**NV**	**NV**	**18.2**	**NV**	**NV**	**NV**	**NV**	**NV**	**2,243**	**182**	**NV**	**NV**	**NV**	**NV**	**1.3**	**0.05**	**0.9**	**NV**	**NV**	**NV**	**NV**	**NV**	**1.38**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.05**	**0.024**	**0.034**	**0.034**	**0.056**	**0.062**	**0.044**	**0.034**	**0.086**	**0.056**	**0.056**	**0.072**	**0.6**	**13.66**	**0.4**	**0.034**	**0.06**	**0.03**	**0.048**	**0.034**	**0.05**	**0.07**	**0.094**	**0.06**	**0.03**	**0.46**	**0.044**	**0.11**	**0.05**
OF1	OF-1-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.035	0.46 U	0.044 U	0.11 U	0.05 U
OF1	OF1-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF2	OF-2-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF2	OF2-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF2	OF9-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF3	OF-3-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF3	OF3-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF4	OF-4-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.035	0.46 U	0.044 U	0.11 U	0.05 U
OF4	OF4-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF5	OF-5-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.032	0.46 U	0.044 U	0.11 U	0.05 U
OF5	OF5-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 U	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF6	OF-6-062613	6/26/2013	0.05 U	0.024 U	0.034 U	0.068 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.6 U	7.4 U	0.4 U	0.034 U	0.06 U	0.03 U	0.048 U	0.034 U	0.05 U	0.07 U	0.094 U	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U
OF6	OF6-022014	2/20/2014	0.05 U	0.024 U	0.034 U	0.034 U	0.056 U	0.062 U	0.044 U	0.034 U	0.086 U	0.056 U	0.056 U	0.072 U	0.56 U	14 UJ	0.4 U	0.034 U	0.06 U	0.03 UJ	0.048 U	0.034 U	0.05 U	0.07 U	0.094 UJ	0.06 U	0.03 U	0.46 U	0.044 U	0.11 U	0.05 U

Notes:

µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported result
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 31
Storm Water Sample Analytical Results - VOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,1,1,2-Tetrachloroethane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,1-Dichloropropene (µg/L)	1,2,3-Trichlorobenzene (µg/L)	1,2,3-Trichloropropane (µg/L)	1,2,4-Trichlorobenzene (µg/L)	1,2,4-Trimethylbenzene (µg/L)	1,2-Dibromo-3-Chloropropane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,3,5-Trimethylbenzene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,3-Dichloropropane (µg/L)	1,4-Dichlorobenzene (µg/L)	2,2-Dichloropropane (µg/L)	2-Chlorotoluene (µg/L)	2-Hexanone (µg/L)	4-Chlorotoluene (µg/L)	Acetone (µg/L)	Benzene (µg/L)	Bromobenzene (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)	Carbon tetrachloride (µg/L)	CFC-11 (µg/L)	CFC-12 (µg/L)	Chloroethane (µg/L)	Chloromethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	cis-1,2-Dichloroethene (µg/L)	cis-1,3-Dichloropropene (µg/L)	Cumene (µg/L)	Dibromomethane (µg/L)	Dichlorobromomethane (µg/L)	Ethylbenzene (µg/L)	Ethylene dibromide (µg/L)	Hexachlorobutadiene (µg/L)	Methyl ethyl ketone (µg/L)	Methyl isobutyl ketone (µg/L)	Methyl t-butyl ether (µg/L)	Methylene chloride (µg/L)	Naphthalene (µg/L)	n-Propylbenzene (µg/L)	p-Isopropyltoluene (µg/L)	sec-Butylbenzene (µg/L)	Styrene (µg/L)	tert-Butylbenzene (µg/L)	Tetrachloroethene (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)	trans-1,2-Dichloroethene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Trichloroethene (µg/L)	Vinyl chloride (µg/L)
Preliminary Storm Water Screening Levels* (µg/L)			**NV**	**200**	**0.33**	**0.77**	**1**	**0.73**	**NV**	**NV**	**NV**	**1.13**	**393**	**NV**	**5.19**	**0.48**	**3.7**	**45.2**	**600**	**NV**	**4**	**NV**	**NV**	**NV**	**2,600**	**6,000**	**1.2**	**NV**	**160**	**NV**	**0.46**	**NV**	**NV**	**20**	**NV**	**0.24**	**4.3**	**18.9**	**130**	**NV**	**NV**	**NV**	**17**	**1.7**	**NV**	**0.9**	**4,800**	**640**	**NV**	**5**	**160**	**NV**	**NV**	**NV**	**100**	**NV**	**0.28**	**1,000**	**1,000**	**NV**	**NV**	**0.49**	**0.13**
2013 Laboratory Practical Quantitation Limits (µg/L)			**0.32**	**0.2**	**0.24**	**0.28**	**0.18**	**0.19**	**0.26**	**0.38**	**0.28**	**0.34**	**0.11**	**0.44**	**0.13**	**0.11**	**0.32**	**0.18**	**0.15**	**0.2**	**0.09**	**0.3**	**0.13**	**1**	**0.16**	**2.6**	**0.13**	**0.18**	**0.22**	**0.2**	**0.24**	**0.17**	**0.16**	**0.1**	**0.24**	**0.18**	**0.24**	**0.22**	**0.24**	**0.2**	**NV**	**0.28**	**0.38**	**0.16**	**0.24**	**0.46**	**0.94**	**1.3**	**0.13**	**3**	**0.004**	**0.14**	**0.15**	**0.12**	**0.22**	**0.15**	**0.28**	**0.13**	**0.22**	**0.24**	**0.34**	**0.17**	**0.13**
OF1	OF-1-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	2.6 U	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	2.5 B	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 U	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF1	OF1-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	2.5 B	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF2	OF-2-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	2.6 U	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	0.22 U	0.24 U	0.2 U	0.15 UJ	0.28 U	0.38 U	0.16 UJ	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 UJ	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF2	OF2-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	**13**	2.8 B	0.24 U	0.2 U	0.15 U	0.28 U	0.44	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF2	OF9-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	**15**	2.7 B	0.24 U	0.2 U	0.15 U	0.28 U	0.4	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF3	OF-3-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	2.6 U	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	0.22 U	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 UJ	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF3	OF3-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	2.6 B	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF4	OF-4-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	2.6 U	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	0.22 U	0.24 U	0.2 U	0.15 UJ	0.28 U	0.38 U	0.16 UJ	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 UJ	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF4	OF4-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	2.4 B	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF5	OF-5-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	3.4	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	0.22 U	0.24 U	0.2 U	0.15 UJ	0.28 U	0.38 U	0.16 UJ	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 UJ	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF5	OF5-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 U	0.24 U	0.18 U	0.24 U	2.4 B	0.24 U	0.2 U	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U
OF6	OF-6-062613	6/26/2013	0.32 U	0.2 U	0.24 U	0.28 U	0.18 UJ	0.19 UJ	0.26 U	0.38 U	0.28 U	0.34 U	0.11 UJ	0.44 U	0.13 UJ	0.11 UJ	0.32 U	0.18 UJ	0.15 UJ	0.2 U	0.094 UJ	0.3 U	0.13 UJ	1 U	0.16 UJ	2.6 U	0.13 UJ	0.18 UJ	0.22 U	0.2 UJ	0.24 U	0.17 UJ	0.16 UJ	0.1 UJ	0.24 U	0.18 UJ	0.24 U	2.4 B	0.24 U	0.2 UJ	0.15 U	0.28 U	0.38 U	0.16 UJ	0.24 U	0.46 U	0.94 U	1.3 U	0.13 UJ	3 U	0.28 U	0.14 U	0.15 UJ	0.12 UJ	0.22 U	0.15 UJ	0.28 U	0.13 UJ	0.22 U	0.24 U	0.34 U	0.17 U	0.13 UJ
OF6	OF6-022014	2/20/2014	0.32 U	0.2 U	0.24 U	0.28 U	0.18 U	0.19 U	0.26 U	0.38 U	0.28 U	0.34 U	0.11 U	0.44 U	0.13 U	0.11 U	0.32 U	0.18 U	0.15 U	0.2 U	0.094 U	0.3 U	0.13 U	1 U	0.16 U	2.6 U	0.13 U	0.18 U	0.22 U	0.2 U	0.24 U	0.17 U	0.16 U	0.1 UJ	0.24 U	0.18 U	0.24 U	2.6 B	0.24 U	0.2 UJ	0.15 U	0.28 U	0.38 U	0.16 U	0.24 U	0.46 U	0.94 U	1.3 U	0.13 U	3 U	0.28 U	0.14 U	0.15 U	0.12 U	0.22 U	0.15 U	0.28 U	0.13 U	0.22 U	0.24 U	0.34 U	0.17 U	0.13 U

Notes:

Detected values in bold and highlighted in orange exceed the preliminary soil cleanup levels.
µg/L = micrograms per liter.
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
B = The laboratory report noted that the analyte was detected in the sample and method blank and the reported result is sample concentration without blank correction.
* Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

CATCH BASIN SOLIDS SAMPLES

Table 17
Catch Basin Solids Sample Analytical Results - Metals
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**7.30**	**3.10**	**540**	**NV**	**3.70**	**35.6**	**310**	**40**	**0.41**	**140**	**3.0**	**6.1**	**0.52**	**410**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**0.11**	**0.42**	**0.052**	**NV**	**0.2**	**0.47**	**0.071**	**0.05**	**0.002**	**0.21**	**0.91**	**0.079**	**0.044**	**0.97**
DP1CB2	DP1CB2-061013	6/11/2013	0.85	**9.19**	173	0.12	1.5	30.9	77.7 E	**84.3**	0.27	20.5	0.91 U	0.13	0.046	**543**
DP1CB3	DP1CB3-061013	6/10/2013	0.68	**3.87**	122	0.17	0.87	19.1	53.4 E	**52.6**	0.097	20.8	0.91 U	0.15	0.043 U	285
DP2CB2	DP2CB2-061013	6/11/2013	2.61	**8.05**	158	0.13	1.68	**51.3**	187 E	**78.7**	0.1	41.9	0.91 U	0.34	0.043 U	**882**
DP2CB5	DP2CB5-060613	6/6/2013	1.87	**5.57**	71	0.13	0.91	**87.5**	62.4 E	**344**	0.06	21.6	0.91 U	0.13	0.084	**429**
DP3CB1	DP3CB1-060613	6/6/2013	**12.7**	**13.8**	156	0.86 U	**8.84**	**161**	289 E	**81**	0.055	130	9.12 U	0.78 U	0.43 U	**1,380**
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	7.1	**12.9**	167	0.86 U	2.04 U	**154**	295 E	**87.2**	**0.44**	119	9.12 U	0.78 U	0.43 U	**1,910**
DP3CB3	DP3CB3-060613	6/6/2013	2.42	4.22 U	92.7	0.86 U	2.04 U	22.7	53.1 E	**42.4**	0.091	24.9	9.12 U	0.78 U	**0.67**	256
DP3CB5	STORM13-121509	12/15/2009	NA	**7.6**	230	NA	1.5	**81**	NA	**280**	0.047	NA	**3.1**	0.78 U	NA	26.1
DP4CB2	DP4CB2-061013	6/11/2013	2.83	**25.1**	215	0.86 U	2.04 U	**105**	149 E	**206**	0.086	56.6	9.12 U	0.78 U	**0.60**	**2,300**
DP4CB3	CB37	2004	NA	20 U	NA	NA	NA	NA	173	**250**	0.08	NA	NA	NA	NA	**1,220**
DP4CB3	STORM14-121509	12/15/2009	NA	**14**	170	NA	1.6	**65**	NA	**310**	0.1	NA	2.2 U	1.1 U	NA	**627**
DP4CB4	DP4CB4-061013	6/10/2013	5.19	**14.3**	209	0.20	**3.89**	**114**	202 E	**526**	0.086	39.6	0.91 U	0.48	0.40	**1,230**
DP4CB4	DP4CB4-021314	2/13/2014	5.62	**11.2**	110	0.086 U	2.19 U	**117**	138	**405**	0.14	36.5	0.92 U	2.06	0.235 E	**1,180**
DP5CB1	DP5CB1-061013	6/11/2013	4.23	**16.5**	152	0.86 U	2.04 U	**124**	**447** E	**87.7**	0.099	132	9.12 U	0.78 U	0.45	**983**
DP5CB1 and DP3CB1	CB123-071908	7/19/2008	NA	**20**	NA	NA	NA	NA	175	**99**	0.07 U	NA	NA	NA	NA	**1,950**
DP5CB4	DP5CB4-061013	6/11/2013	4.66	**18.6**	127	0.20	2.22	**56.9**	119 E	**181**	0.14	32.7	0.91 U	0.31	0.14	**983**
DP6CB1	STORM5-121509	12/15/2009	NA	**4.4**	160	NA	1.4	**37**	NA	**110**	0.052	NA	2.9	0.72 U	NA	27.2
DP6CB1	DP6CB1-060613	6/6/2013	3.93	**24.4**	73.7	0.86 U	2.04 U	**45.9**	95.9 E	**95.6**	0.044	31.6	9.12 U	0.78 U	0.43 U	**922**
DP6CB4	DP6CB4-061013	6/10/2013	4.17	**8.61**	102	0.16	2.01	**87.8**	163 E	**327**	0.1	35.4	0.91 U	0.38	0.23	**878**
DP6CB4	DP6CB4-021314	2/13/2014	4.56	**7.17**	97.8	0.086 U	2.19 U	**53.7**	115	**243**	0.14	25.4	0.92 U	1.03	0.18 E	**885**

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detecteded values highlighted in blue exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram.
NA = Not analyzed
ND = Analyte not detected; however, the detection limit was not available.
NV = No available value.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 18
Catch Basin Solids Sample Analytical Results - PAHs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benz[a]anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**0.50**	**0.56**	**0.96**	**0.062**	**0.062**	**0.062**	**0.67**	**0.062**	**0.062**	**0.062**	**1.7**	**0.54**	**0.062**	**2.1**	**1.5**	**2.6**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**0.000007**	**0.000046**	**0.000044**	**0.00009**	**0.00011**	**0.000091**	**0.00017**	**0.00018**	**0.000095**	**0.00017**	**0.00014**	**0.000075**	**0.00031**	**0.00011**	**0.00016**	**0.00013**
DP1CB2	DP1CB2-061013	6/11/2013	0.056	0.036	0.035				0.14				0.24	0.06		0.088	0.13	0.22
DP1CB3	DP1CB3-061013	6/10/2013	0.056	0.036	0.035				0.14				0.12	0.06		0.088	0.13	0.11
DP2CB2	DP2CB2-061013	6/11/2013	0.056	0.036	0.035				0.24				0.6	0.06		0.088	0.29	0.57
DP2CB5	DP2CB5-060613	6/6/2013	0.056	0.036	0.063				0.29				0.74	0.06		0.088	0.47	0.69
DP3CB1	DP3CB1-060613	6/6/2013	0.056	0.036	0.046				0.14				0.65	0.06		0.12	0.41	0.66
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.056	0.036	0.035				0.16				0.5	0.06		0.097	0.26	0.52
DP3CB3	DP3CB3-060613	6/6/2013	0.028	0.018	0.021				0.12				0.37	0.03		0.044	0.24	0.35
DP3CB5	STORM13-121509	12/15/2009	0.031	0.031	0.76				0.16			0.031	0.42	0.031	0.031	0.031	0.72	0.86
DP4CB2	DP4CB2-061013	6/11/2013	0.056	0.036	0.047				0.2				1	0.06		0.088	0.66	0.79
DP4CB3	CB37	2004	0.17	0.14	0.82				0.14					0.35		0.14		2.6
DP4CB3	STORM14-121509	12/15/2009	0.045	0.045		0.045	0.045	0.045	0.045	0.045		0.045	0.47	0.045	0.045	0.18	0.61	0.88
DP4CB4	DP4CB4-061013	6/10/2013	0.087	0.036	0.33				0.57				1.4	0.06		0.088	0.81	1.3
DP4CB4	DP4CB4-021314	2/13/2014	0.035	0.018	0.079				0.46				1.3	0.059		0.044	0.83	1.1
DP5CB1 and DP3CB1	CB123-071908	7/19/2008		0.42					0.29							0.36		
DP5CB1	DP5CB1-061013	6/11/2013	0.056	0.036	0.084				0.17				0.73	0.06		0.088	0.38	0.79
DP5CB4	DP5CB4-061013	6/11/2013	0.056	0.036	0.17				0.24				0.92	0.06		0.088	0.27	1.1
DP6CB1	STORM5-121509	12/15/2009	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.084	0.029	0.029	0.029	0.029	0.2
DP6CB1	DP6CB1-060613	6/6/2013	0.056	0.036	0.34				0.14				0.63	0.06		0.088	0.54	0.52
DP6CB4	DP6CB4-061013	6/10/2013	0.056	0.036	0.035				0.28				0.69	0.06		0.088	0.44	0.73
DP6CB4	DP6CB4-021314	2/13/2014	0.028	0.018	0.018				0.29				0.57	0.035		0.044	0.37	0.66

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram
NA = Not analyzed.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
J = The laboratory report noted that the reported result is an estimate because the internal standard associated with the analyte is out of control limits.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 19
Catch Basin Solids Sample Analytical Results - PCBs and Petroleum Hydrocarbons
8th Avenue Terminals, Inc. Site
Seattle, Washington

			PCBs									Petroleum Hydrocarbons		
Location	Sample ID	Sample Date	Aroclor 1016 (mg/kg)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Total PCBs (U=1/2 MRL) (mg/kg)	Total PCBs (U=0) (mg/kg)	Gasoline Range Organics (mg/kg)	Diesel Range Organics (mg/kg)	Heavy Oil Range Organics (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.23**	**0.23**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.23**	**0.23**	**NV**	**NV**	**NV**
DP1CB2	DP1CB2-061013	6/11/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	2.7	300	2,600
DP1CB3	DP1CB3-061013	6/10/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	0.73	88	1,400
DP2CB2	DP2CB2-061013	6/11/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	1	720	7,900
DP2CB5	DP2CB5-060613	6/6/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	1.1	180	1,900
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	0.55	240	2,300
DP3CB1	DP3CB1-060613	6/6/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	0.57	210	2,200
DP3CB3	DP3CB3-060613	6/6/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	0.65	220	2,600
DP3CB5	STORM13-121509	12/15/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.39	81	760
DP4CB2	DP4CB2-061013	6/11/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	0.83	750	7,800
DP4CB3	CB37	2004	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		NA	NA	180	650
DP4CB3	STORM14-121509	12/15/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.79	130	990
DP4CB4	DP4CB4-061013	6/10/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	0.87	6,000	21,000
DP4CB4	DP4CB4-021314	2/13/2014	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.11 E	0.033 U	0.21	0.11	27	5,400	24,000
DP5CB1	DP5CB1-061013	6/11/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	0.82	2,200	19,000
DP5CB4	DP5CB4-061013	6/11/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	0.77	1,900	15,000
DP5CB1 and DP3CB1	CB123-071908	7/19/2008	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.03 U	0.079 U		NA	NA	810	1,600
DP6CB1	STORM5-121509	12/15/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.14 U	82	490
DP6CB1	DP6CB1-060613	6/6/2013	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	U	0 U	0.43	230	1,600
DP6CB4	DP6CB4-061013	6/10/2013	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	U	0 U	9.6	3,100	7,500
DP6CB4	DP6CB4-021314	2/13/2014	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.2 E	0.033 U		0.2	2.8	2,500	9,100

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram.
NA = Not analyzed.
NV = No available value.
U = Analyte was not detected at or above the reported result.
E = The laboratory report indicated that the analyte result in the laboratory control sample was out of control limits and the reported concentration should be considered an estimate.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 20
Catch Basin Solids Sample Analytical Results - Phenols
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	2,4,5-Trichlorophenol (mg/kg)	2,4,6-Trichlorophenol (mg/kg)	2,4-Dichlorophenol (mg/kg)	2,4-Dimethylphenol (mg/kg)	2,4-Dinitrophenol (mg/kg)	2-Chlorophenol (mg/kg)	2-Methylphenol (o-Cresol) (mg/kg)	2-Nitrophenol (mg/kg)	3-Methylphenol and 4-Methylphenol coelution (mg/kg)	4,6-Dinitro-2-Methylphenol (mg/kg)	4-Chloro-3-methylphenol (mg/kg)	4-Nitrophenol (mg/kg)	Pentachlorophenol (mg/kg)	Phenol (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**NV**	**NV**	**NV**	**0.029**	**NV**	**NV**	**0.063**	**NV**	**0.67**	**NV**	**NV**	**NV**	**0.36**	**0.42**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**0.0097**	**0.0081**	**0.0058**	**0.0186**	**0.0139**	**0.0061**	**0.0065**	**0.0083**	**0.0145**	**0.0106**	**0.0045**	**0.0177**	**0.0062**	**0.0054**
DP1CB2	DP1CB2-061013	6/11/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP1CB3	DP1CB3-061013	6/10/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP2CB2	DP2CB2-061013	6/11/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP2CB5	DP2CB5-060613	6/6/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP3CB1	DP3CB1-060613	6/6/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP3CB3	DP3CB3-060613	6/6/2013	1.9 U	1.6 U	1.2 U	3.7 U	2.8 U	1.2 U	1.3 U	1.6 U	2.9 U	2.1 U	0.88 U	3.6 U	1.2 U	1.1 U
DP4CB2	DP4CB2-061013	6/11/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP4CB4	DP4CB4-061013	6/10/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP4CB4	DP4CB4-021314	2/13/2014	0.19 U	0.16 U	0.12 U	0.37 U	0.28 UJ	0.12 U	0.13 U	0.16 U	**21**	0.2 U	0.09 U	0.36 UJ	0.12 UJ	**0.56**
DP5CB1	DP5CB1-061013	6/11/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP5CB1andDP3CB1	CB123-071908	7/19/2008	NA	NA	NA	4.2 U	NA	NA	0.42 U	NA	NA	NA	NA	NA	2.1 U	0.42 U
DP5CB4	DP5CB4-061013	6/11/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP6CB1	DP6CB1-060613	6/6/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP6CB4	DP6CB4-061013	6/10/2013	3.8 U	3.2 U	2.3 U	7.4 U	5.5 U	2.5 U	2.6 U	3.3 U	5.8 U	4.2 U	1.8 U	7.1 U	2.5 U	2.2 U
DP6CB4	DP6CB4-021314	2/13/2014	0.19 U	0.16 U	0.12 U	0.37 U	0.28 UJ	0.12 U	0.13 U	0.16 U	**5.3**	0.2 U	0.09 U	0.36 UJ	0.12 UJ	0.4

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram.
NA = Not analyzed
NV = No value available.
U = The laboratory noted that the analyte was not detected at or above the reported result.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 21
Catch Basin Solids Sample Analytical Results - Phthalates
8th Avenue Terminals, Inc. Site
Seattle,Washington

Location	Sample ID	Sample Date	Bis(2-ethylhexyl) phthalate (mg/kg)	Butyl benzyl phthalate (mg/kg)	Dibutyl phthalate(mg/kg)	Diethyl phthalate (mg/kg)	Dimethyl phthalate (mg/kg)	Di-n-octyl phthalate (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**1.3**	**0.063**	**1.4**	**0.2**	**0.071**	**6.2**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**0.014**	**0.0058**	**0.02**	**0.0041**	**0.0012**	**0.0033**
DP1CB2	DP1CB2-061013	6/11/2013	**9.1**	2.3 U	8 U	1.6 U	0.48 U	1.4 UJ
DP1CB3	DP1CB3-061013	6/10/2013	5.4 U	2.3 U	8 U	1.6 U	0.48 U	1.4 U
DP2CB2	DP2CB2-061013	6/11/2013	**6.6**	2.3 U	8 U	1.6 U	0.48 U	1.4 U
DP2CB5	DP2CB5-060613	6/6/2013	**6.2**	**7.6**	8 U	1.6 U	0.48 U	1.4 U
DP3CB1	DP3CB1-060613	6/6/2013	**7.7**	2.3 U	8 U	**4.9**	0.48 U	1.4 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	**7.7** E	2.3 UJ	8 U	**3.1**	0.48 U	1.4 UJ
DP3CB3	DP3CB3-060613	6/6/2013	2.7 U	1.2 U	4 U	0.8 U	0.24 U	0.68 U
DP4CB2	DP4CB2-061013	6/11/2013	**55**	2.3 U	8 U	1.6 U	0.48 U	1.4 U
DP4CB3	CB37	2004	**1.6**	**1.3**	0.14 U	0.14 U	**0.28**	0.14 U
DP4CB4	DP4CB4-061013	6/10/2013	5.4 U	**3.2**	8 U	1.6 U	0.48 U	2.2
DP4CB4	DP4CB4-021314	2/13/2014	**40**	**1.8**	0.4 U	0.8 U	**0.35**	0.64 U
DP5CB1	DP5CB1-061013	6/11/2013	**20**	2.3 U	8 U	**9.7**	0.48 U	1.4 U
DP5CB1 and DP3CB1	CB123-071908	7/19/2008	1.7 B	**2.4**	0.42 U	0.42 U	0.42 U	0.42 U
DP5CB4	DP5CB4-061013	6/11/2013	**24**	2.3 U	8 U	1.6 U	0.48 U	1.4 U
DP6CB1	DP6CB1-060613	6/6/2013	5.4 U	2.3 U	8 U	1.6 U	0.48 U	1.4 U
DP6CB4	DP6CB4-061013	6/10/2013	**40**	2.3 U	8 U	1.6 U	0.48 U	2.8
DP6CB4	DP6CB4-021314	2/13/2014	**25**	**1.4**	0.4 U	0.08 U	0.053	0.64

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels.
Results that exceed the screening levels due to possible interference from laboratory contamination are highlighted in purple.
mg/kg = milligrams per kilogram.
U = The laboratory noted that the analyte was not detected at or above the reported result.
UJ = The laboratory report noted that the analyte was not detected at or above the reported estimate.
B = The laboratory report noted that the analyte was detected in the sample and method blank, and the reported result is sample concentration without blank correction or associated quantitation limit.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 22
Catch Basin Solids Sample Analytical Results - SVOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,2,4-Trichlorobenzene (mg/kg)	1,2-Dichlorobenzene (mg/kg)	1,3-Dichlorobenzene (mg/kg)	1,4-Dichlorobenzene (mg/kg)	2,4-Dinitrotoluene (mg/kg)	2,6-Dinitrotoluene (mg/kg)	2-Chloronaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	2-Nitroaniline (mg/kg)	4-Bromophenyl phenyl ether (mg/kg)	4-Chloroaniline (mg/kg)	4-Chlorophenyl-Phenylether (mg/kg)	4- Nitroaniline (mg/kg)	Benzoic acid (mg/kg)	Benzyl alcohol (mg/kg)	Bis(2-chloroethoxy) methane (mg/kg)	Bis(2-Chloroethyl) Ether (mg/kg)	Bis(2-chloroisopropyl) ether (mg/kg)	Carbazole (mg/kg)	Dibenzofuran (mg/kg)	Hexachloro-benzene (mg/kg)	Hexachloro-butadiene (mg/kg)	Hexachlorocyclo -pentadiene (mg/kg)	Hexachloro-ethane (mg/kg)	Isophorone (mg/kg)	m-Nitroaniline (mg/kg)	Nitrobenzene (mg/kg)	N-Nitrosodi-n -propylamine (mg/kg)	N-Nitrosodi -phenylamine (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**0.031**	**0.035**	**0.17**	**0.11**	**NV**	**NV**	**NV**	**0.67**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.65**	**0.057**	**NV**	**NV**	**NV**	**NV**	**0.54**	**0.022**	**0.011**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**0.0034**	**0.004**	**0.0027**	**0.0024**	**0.0016**	**0.0019**	**0.0014**	**0.001**	**0.0026**	**0.0016**	**0.18**	**0.0016**	**0.18**	**0.055**	**0.00051**	**0.0014**	**0.0016**	**0.0016**	**0.002**	**0.001**	**0.001**	**0.002**	**0.0022**	**0.0033**	**0.0011**	**0.017**	**0.0026**	**0.0031**	**0.0048**
DP1CB2	DP1CB2-061013	6/11/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	**2**	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP1CB3	DP1CB3-061013	6/10/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP2CB2	DP2CB2-061013	6/11/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP2CB5	DP2CB5-060613	6/6/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP3CB1	DP3CB1-060613	6/6/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP3CB3	DP3CB3-060613	6/6/2013	0.68 U	0.8 U	0.52 U	0.48 U	0.32 U	0.36 U	0.28 U	0.2 U	0.52 U	0.32 U	36 U	0.32 U	3.6 U	11 U	1 U	0.28 U	0.32 U	0.32 U	0.4 U	0.2 U	0.2 U	0.4 U	0.44 U	0.68 U	0.24 U	3.5 U	0.52 U	0.6 U	0.2 U
DP4CB2	DP4CB2-061013	6/11/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP4CB4	DP4CB4-061013	6/10/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP4CB4	DP4CB4-021314	2/13/2014	0.068 U	0.08 U	0.052 U	0.048 U	0.032 UJ	0.038 U	0.029 U	0.2 U	0.052 U	0.033 U	3.6 U	0.032 U	0.36 U	**3.1** E	0.1 U	0.029 U	0.032 UJ	0.032 U	0.4 U	0.2 U	0.02 U	0.04 U	0.044 UJ	0.064 U	0.022 U	0.35 U	0.052 U	0.06 U	0.02 U
DP5CB1	DP5CB1-061013	6/11/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP5CB1 and DP3CB1	CB123-071908	7/19/2008	NA	NA	NA	NA	NA	NA	NA	0.57	NA	NA	NA	NA	NA	4.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DP5CB4	DP5CB4-061013	6/11/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP6CB1	DP6CB1-060613	6/6/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP6CB4	DP6CB4-061013	6/10/2013	1.4 U	1.6 U	1 U	0.96 U	0.64 U	0.72 U	0.56 U	0.4 U	1 U	0.64 U	71 U	0.64 U	7.3 U	22 U	2 U	0.56 U	0.64 U	0.64 U	0.8 U	0.4 U	0.4 U	0.8 U	0.88 U	1.4 U	0.48 U	7 U	1 U	1.2 U	0.4 U
DP6CB4	DP6CB4-021314	2/13/2014	0.068 U	0.08 U	0.052 U	0.048 U	0.032 UJ	0.038 U	0.029 U	0.033	0.052 U	0.033 U	3.6 U	0.032 U	0.36 U	**2.3** E	**0.31**	0.029 U	0.032 UJ	0.032 U	0.049	0.02 U	0.02 U	0.04 U	0.044 UJ	0.064 U	0.022 U	0.35 U	0.052 U	0.06 U	0.02 U

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels
mg/kg = milligrams per kilogram
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported resul
E = The laboratory report indicated that the reported result is an estimate because it exceeds calibration range
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 23
Catch Basin Solids Sample Analytical Results - VOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	1,1,1,2-Tetrachloroethane (mg/kg)	1,1,1-Trichloroethane (mg/kg)	1,1,2,2-Tetrachloroethane (mg/kg)	1,1,2-Trichloroethane (mg/kg)	1,1-Dichloroethane (mg/kg)	1,1-Dichloroethene (mg/kg)	1,1-Dichloropropene (mg/kg)	1,2,3-Trichlorobenzene (mg/kg)	1,2,3-Trichloropropane (mg/kg)	1,2,4-Trichlorobenzene (mg/kg)	1,2,4-Trimethylbenzene (mg/kg)	1,2-Dibromo-3-Chloropropane (mg/kg)	1,2-Dichlorobenzene (mg/kg)	1,2-Dichloroethane (mg/kg)	1,2-Dichloropropane (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			NV	NV	NV	NV	NV	NV	NV	NV	NV	0.031	NV	NV	0.035	NV	NV
2013 Laboratory Practical Quantitation Limits (mg/kg)			0.001	0.0012	0.0008	0.001	0.001	0.0006	0.011	0.0014	0.0013	0.0021	0.0016	0.0042	0.0009	0.001	0.0017
DP1CB2	DP1CB2-061013	6/11/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.051	0.08 U	0.016 U	0.016 U	0.034 U
DP1CB3	DP1CB3-061013	6/10/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.025	0.08 U	0.016 U	0.016 U	0.034 U
DP2CB2	DP2CB2-061013	6/11/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.083	0.08 U	0.016 U	0.016 U	0.034 U
DP2CB5	DP2CB5-060613	6/6/2013	0.028 U	0.021 U	0.036 U	0.014 U	0.017 U	0.027 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP3CB1	DP3CB1-060613	6/6/2013	0.028 U	0.021 U	0.036 U	0.014 U	0.017 U	0.027 U	0.024 U	0.019 U	0.022 U	0.036 U	0.1	0.08 U	0.016 U	0.016 U	0.034 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.028 U	0.021 U	0.036 U	0.014 U	0.017 U	0.027 U	0.024 U	0.019 U	0.022 U	0.036 U	0.13	0.08 U	0.016 U	0.016 U	0.034 U
DP3CB3	DP3CB3-060613	6/6/2013	0.028 U	0.021 U	0.036 U	0.014 U	0.017 U	0.027 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP3CB5	STORM13-121509	12/15/2009	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	0.008 U	0.002 U	0.002 U	0.002 U
DP4CB2	DP4CB2-061013	6/11/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP4CB3	STORM14-121509	12/15/2009	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003	0.013 U	0.003 U	0.003 U	0.003 U
DP4CB4	DP4CB4-061013	6/10/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP4CB4	DP4CB4-021314	2/13/2014	0.001 UJ	0.001 U	8E-04 UJ	1E-03 UJ	1E-03 U	6E-04 U	0.001 U	0.002 E	0.001 UJ	0.002 E	0.006 E	0.004 UJ	0.001 E	0.001 U	0.002 U
DP5CB1	DP5CB1-061013	6/11/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP5CB4	DP5CB4-061013	6/11/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP6CB1	STORM5-121509	12/15/2009	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.007 U	0.001 U	0.001 U	0.001 U
DP6CB1	DP6CB1-060613	6/6/2013	0.028 U	0.021 U	0.036 U	0.014 U	0.017 U	0.027 U	0.024 U	0.019 U	0.022 U	0.036 U	0.028	0.08 U	0.016 U	0.016 U	0.034 U
DP6CB4	DP6CB4-061013	6/10/2013	0.028 U	0.022 U	0.036 U	0.014 U	0.017 U	0.026 U	0.024 U	0.019 U	0.022 U	0.036 U	0.016 U	0.08 U	0.016 U	0.016 U	0.034 U
DP6CB4	DP6CB4-021314	2/13/2014	0.001 U	0.001 U	8E-04 U	1E-03 U	1E-03 U	6E-04 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.004 U	9E-04 U	0.001 U	0.002 U

Location	Sample ID	Sample Date	1,3,5-Trimethylbenzene (mg/kg)	1,3-Dichlorobenzene (mg/kg)	1,3-Dichloropropane (mg/kg)	1,4-Dichlorobenzene (mg/kg)	2,2-Dichloropropane (mg/kg)	2-Chloroethyl vinyl ether (mg/kg)	2-Chlorotoluene (mg/kg)	2-Hexanone (mg/kg)	4-Chlorotoluene (mg/kg)	Acetone (mg/kg)	Acrylonitrile (mg/kg)	Benzene (mg/kg)	Benzene, 1,2,3-Trimethyl- (mg/kg)	Bromobenzene (mg/kg)	Bromoform (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			NV	0.17	NV	0.11	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
2013 Laboratory Practical Quantitation Limits (mg/kg)			0.0012	0.0015	0.001	0.001	0.0013	NV	0.0011	0.005	0.0014	0.011	NV	0.0007	NV	0.001	0.0012
DP1CB2	DP1CB2-061013	6/11/2013	0.023	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.2 U	NA	0.014 U	NA	0.012 U	0.034 U
DP1CB3	DP1CB3-061013	6/10/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.2 U	NA	0.014 U	NA	0.012 U	0.034 U
DP2CB2	DP2CB2-061013	6/11/2013	0.038	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.29 lc	NA	0.014 U	NA	0.012 U	0.034 U
DP2CB5	DP2CB5-060613	6/6/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.025 U	NA	0.016 U	0.095 U	0.019 U	0.21 U	NA	0.014 U	NA	0.012 U	0.035 U
DP3CB1	DP3CB1-060613	6/6/2013	0.049	0.02 U	0.02 U	0.032 U	0.025 U	NA	0.016 U	0.095 U	0.019 U	0.21 U	NA	0.014 U	NA	0.012 U	0.035 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.06	0.02 U	0.02 U	0.032 U	0.025 U	NA	0.016 U	0.095 U	0.019 U	0.21 U	NA	0.014 U	NA	0.012 U	0.035 U
DP3CB3	DP3CB3-060613	6/6/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.025 U	NA	0.016 U	0.095 U	0.019 U	0.21 U	NA	0.014 U	NA	0.012 U	0.035 U
DP3CB5	STORM13-121509	12/15/2009	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.078 U	0.002 U	NA	0.002 U	0.8	0.016 U	0.003	0.009	0.002 U	0.002 U
DP4CB2	DP4CB2-061013	6/11/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.24 lc	NA	0.014 U	NA	0.012 U	0.034 U
DP4CB3	STORM14-121509	12/15/2009	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.13 U	0.003 U	NA	0.003 U	1.1	0.027 U	0.004	0.008	0.003 U	0.003 U
DP4CB4	DP4CB4-061013	6/10/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.2 U	NA	0.014 U	NA	0.012 U	0.034 U
DP4CB4	DP4CB4-021314	2/13/2014	0.003 E	0.002 UJ	0.001 UJ	0.001 UJ	0.001 U	NA	0.001 E	0.005 UJ	0.001 UJ	0.32	NA	0.002	NA	1E-03 UJ	0.001 UJ
DP5CB1	DP5CB1-061013	6/11/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.41 lc	NA	0.014 U	NA	0.012 U	0.034 U
DP5CB4	DP5CB4-061013	6/11/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.37 lc	NA	0.014 U	NA	0.012 U	0.034 U
DP6CB1	STORM5-121509	12/15/2009	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.072 U	0.001 U	NA	0.001 U	0.27	0.014 U	0.002	0.001 U	0.001 U	0.001 U
DP6CB1	DP6CB1-060613	6/6/2013	0.02	0.02 U	0.02 U	0.032 U	0.025 U	NA	0.016 U	0.095 U	0.019 U	0.21 U	NA	0.014 U	NA	0.012 U	0.035 U
DP6CB4	DP6CB4-061013	6/10/2013	0.011 U	0.02 U	0.02 U	0.032 U	0.026 U	NA	0.016 U	0.096 U	0.019 U	0.2 U	NA	0.014 U	NA	0.012 U	0.034 U
DP6CB4	DP6CB4-021314	2/13/2014	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	NA	0.001 U	0.005 U	0.001 U	0.4	NA	7E-04 U	NA	1E-03 U	0.001 U

Location	Sample ID	Sample Date	Bromomethane (mg/kg)	Carbon tetrachloride (mg/kg)	CFC-11 (mg/kg)	CFC-113 (mg/kg)	CFC-12 (mg/kg)	Chlorobenzene (mg/kg)	Chlorodibromomethane (mg/kg)	Chloroethane (mg/kg)	Chloroform (mg/kg)	Chloromethane (mg/kg)	cis-1,2-Dichloroethene (mg/kg)	cis-1,3-Dichloropropene (mg/kg)	Cumene (mg/kg)	Dibromomethane (mg/kg)	Dichlorobromomethane (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
2013 Laboratory Practical Quantitation Limits (mg/kg)			0.0015	0.0008	0.0005	NV	0.0015	0.0009	0.0008	0.0011	0.012	0.001	0.0015	0.00009	NV	0.0012	0.0008
DP1CB2	DP1CB2-061013	6/11/2013	0.034 U	0.03 U	0.074	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.017 U	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP1CB3	DP1CB3-061013	6/10/2013	0.034 U	0.03 U	0.021	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.027 lc	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP2CB2	DP2CB2-061013	6/11/2013	0.034 U	0.03 U	0.02 U	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.017 U	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP2CB5	DP2CB5-060613	6/6/2013	0.034 UJ	0.03 U	0.021 U	NA	0.02 U	0.014 UJ	0.025 U	0.024 U	0.02 lc	0.025 U	0.021 U	0.023 U	0.019 U	0.022 U	0.025 U
DP3CB1	DP3CB1-060613	6/6/2013	0.034 UJ	0.03 U	0.021 U	NA	0.02 U	0.014 UJ	0.025 U	0.024 U	0.017 U	0.025 U	0.021 U	0.023 U	0.019 U	0.022 U	0.025 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.034 UJ	0.03 U	0.021 U	NA	0.02 U	0.014 UJ	0.025 U	0.024 U	0.017 U	0.025 U	0.021 U	0.023 U	0.019 U	0.022 U	0.025 U
DP3CB3	DP3CB3-060613	6/6/2013	0.034 UJ	0.03 U	0.021 U	NA	0.02 U	0.014 UJ	0.025 U	0.024 U	0.041 lc	0.025 U	0.021 U	0.023 U	0.019 U	0.022 U	0.025 U
DP3CB5	STORM13-121509	12/15/2009	0.008 U	0.002 U	0.014	0.002 U	0.008 U	0.002 U	0.002 U	0.008 U	0.008 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DP4CB2	DP4CB2-061013	6/11/2013	0.034 U	0.03 U	0.057	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.017 U	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP4CB3	STORM14-121509	12/15/2009	0.013 U	0.003 U	0.017	0.003 U	0.013 U	0.003 U	0.003 U	0.013 U	0.013 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
DP4CB4	DP4CB4-061013	6/10/2013	0.034 U	0.03 U	0.02 U	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.068 lc	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP4CB4	DP4CB4-021314	2/13/2014	0.002 U	8E-04 U	0.002	NA	0.002 U	9E-04 UJ	8E-04 UJ	0.001 U	0.012 U	0.001 U	0.002 U	9E-04 U	8E-04 UJ	0.001 U	8E-04 U
DP5CB1	DP5CB1-061013	6/11/2013	0.034 U	0.03 U	0.02 U	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.017 U	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP5CB4	DP5CB4-061013	6/11/2013	0.034 U	0.03 U	0.046	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.017 U	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP6CB1	STORM5-121509	12/15/2009	0.007 U	0.001 U	0.007 U	0.001 U	0.007 U	0.001 U	0.001 U	0.007 U	0.007 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
DP6CB1	DP6CB1-060613	6/6/2013	0.034 UJ	0.03 U	0.051	NA	0.02 U	0.014 UJ	0.025 U	0.024 U	0.021 lc	0.025 U	0.021 U	0.023 U	0.019 U	0.022 U	0.025 U
DP6CB4	DP6CB4-061013	6/10/2013	0.034 U	0.03 U	0.02 U	NA	0.02 U	0.014 UJ	0.026 U	0.024 U	0.043 lc	0.026 U	0.022 U	0.022 U	0.019 U	0.022 U	0.024 U
DP6CB4	DP6CB4-021314	2/13/2014	0.002 U	8E-04 U	0.001	NA	0.002 U	9E-04 U	8E-04 U	0.001 U	0.012 U	0.001 U	0.002 U	9E-04 U	8E-04 U	0.001 U	8E-04 U

Location	Sample ID	Sample Date	Ethylbenzene (mg/kg)	Ethylene dibromide (mg/kg)	Hexachlorobutadiene (mg/kg)	Isopropyl ether (mg/kg)	Methyl ethyl ketone (mg/kg)	Methyl isobutyl ketone (mg/kg)	Methyl t-butyl ether (mg/kg)	Methylene chloride (mg/kg)	Naphthalene (mg/kg)	n-Butylbenzene (mg/kg)	n-Propylbenzene (mg/kg)	p-Isopropyltoluene (mg/kg)	sec-Butylbenzene (mg/kg)	Styrene (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			0.01	NV	0.011	NV	NV	NV	NV	NV	2.1	NV	NV	NV	NV	NV
2013 Laboratory Practical Quantitation Limits (mg/kg)			0.0009	0.0007	0.011	NV	0.008	0.01	0.0009	0.014	0.00022	NV	0.001	0.0009	0.0012	0.0007
DP1CB2	DP1CB2-061013	6/11/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.081 lc	0.024 U	NA	0.017 U	0.018	0.015 U	0.046
DP1CB3	DP1CB3-061013	6/10/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP2CB2	DP2CB2-061013	6/11/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.31 lc	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP2CB5	DP2CB5-060613	6/6/2013	0.013 U	0.029 U	0.041 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.021 U
DP3CB1	DP3CB1-060613	6/6/2013	0.013 U	0.029 U	0.041 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.021 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	**0.021**	0.029 U	0.041 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.021 U
DP3CB3	DP3CB3-060613	6/6/2013	0.013 U	0.029 U	0.041 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.021 U
DP3CB5	STORM13-121509	12/15/2009	0.002 U	0.002 U	0.002 U	0.002 U	0.07	0.016 U	0.002 U	0.008 U	0.008 U	0.002 U	0.002 U	0.003	0.002 U	0.002
DP4CB2	DP4CB2-061013	6/11/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP4CB3	STORM14-121509	12/15/2009	0.003 U	0.003 U	0.003 U	0.003 U	0.083	0.027 U	0.003 U	0.013 U	0.013 U	0.003 U	0.003 U	0.007	0.003 U	0.003
DP4CB4	DP4CB4-061013	6/10/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP4CB4	DP4CB4-021314	2/13/2014	0.003 E	7E-04 UJ	0.002 UJ	NA	0.084	0.028	9E-04 U	0.014 U	0.005 E	NA	0.001 E	0.02 E	0.002 E	0.002 E
DP5CB1	DP5CB1-061013	6/11/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.31 lc	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP5CB4	DP5CB4-061013	6/11/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP6CB1	STORM5-121509	12/15/2009	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.014 U	0.001 U	0.007 U	0.007 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
DP6CB1	DP6CB1-060613	6/6/2013	0.013 U	0.029 U	0.041 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.021 U
DP6CB4	DP6CB4-061013	6/10/2013	0.013 U	0.03 U	0.04 U	NA	0.14 U	0.14 U	0.013 U	0.054 U	0.024 U	NA	0.017 U	0.012 U	0.015 U	0.022 U
DP6CB4	DP6CB4-021314	2/13/2014	9E-04 U	7E-04 U	0.002 U	NA	0.071	0.01 U	9E-04 U	0.014 UJ	0.001 U	NA	1E-03 U	0.005	0.001 U	7E-04 U

Location	Sample ID	Sample Date	Tert-Butylbenzene (mg/kg)	Tetrachloroethene (mg/kg)	Toluene (mg/kg)	Total Xylenes (mg/kg)	Trans-1,2-Dichloroethene (mg/kg)	trans-1,3-Dichloropropene (mg/kg)	Trichloroethene (mg/kg)	Vinyl chloride (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			NV	0.0016	NV	0.003	NV	NV	0.0011	NV
2013 Laboratory Practical Quantitation Limits (mg/kg)			0.0011	0.0016	0.0011	0.003	0.0013	0.0005	0.0011	0.0009
DP1CB2	DP1CB2-061013	6/11/2013	0.022 U	0.026 U	0.017 U	0.03 U	0.024 U	0.015 U	0.034 U	0.016 U
DP1CB3	DP1CB3-061013	6/10/2013	0.022 U	0.026 U	0.017 U	0.03 U	0.024 U	0.015 U	0.034 U	0.016 U
DP2CB2	DP2CB2-061013	6/11/2013	0.022 U	0.026 U	0.017 U	0.03 U	0.024 U	0.015 U	0.034 U	0.016 U
DP2CB5	DP2CB5-060613	6/6/2013	0.021 U	0.026 U	0.46	0.03 U	0.023 U	0.015 U	0.033 U	0.016 U
DP3CB1	DP3CB1-060613	6/6/2013	0.021 U	0.026 U	0.017 U	**0.026**	0.023 U	0.015 U	0.033 U	0.016 U
DP3CB1	DP10CB1-060613(dupl.)	6/6/2013	0.021 U	0.026 U	0.024	**0.15**	0.023 U	0.015 U	0.033 U	0.016 U
DP3CB3	DP3CB3-060613	6/6/2013	0.021 U	0.026 U	0.017 U	**0.03**	0.023 U	0.015 U	0.033 U	0.016 U
DP3CB5	STORM13-121509	12/15/2009	0.002 U	0.002 U	0.008 U	**0.01**	0.002 U	0.002 U	0.002 U	0.002 U
DP4CB2	DP4CB2-061013	6/11/2013	0.022 U	0.026 U	0.017 U	0.03 U	0.024 U	0.015 U	0.034 U	0.016 U
DP4CB3	STORM14-121509	12/15/2009	0.003 U	0.003 U	0.013	**0.012**	0.003 U	0.003 U	0.003 U	0.003 U
DP4CB4	DP4CB4-061013	6/10/2013	0.022 U	0.026 U	0.017 U	**0.03**	0.024 U	0.015 U	0.034 U	0.016 U
DP4CB4	DP4CB4-021314	2/13/2014	0.001 UJ	0.002 UJ	8.3 E	**0.01** E	0.001 U	5E-04 UJ	0.001 U	0.003
DP5CB1	DP5CB1-061013	6/11/2013	0.022 U	0.026 U	0.017 U	**0.03**	0.024 U	0.015 U	0.034 U	0.016 U
DP5CB4	DP5CB4-061013	6/11/2013	0.022 U	0.026 U	0.017 U	**0.03**	0.024 U	0.015 U	0.034 U	0.016 U
DP6CB1	STORM5-121509	12/15/2009	0.001 U	0.001 U	0.007 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
DP6CB1	DP6CB1-060613	6/6/2013	0.021 U	0.026 U	0.017 U	0.02 U	0.023 U	0.015 U	0.033 U	0.016 U
DP6CB4	DP6CB4-061013	6/10/2013	0.022 U	0.026 U	4.2	0.03 U	0.024 U	0.015 U	0.034 U	0.016 U
DP6CB4	DP6CB4-021314	2/13/2014	0.001 U	0.002 U	0.29 E	7E-04	0.001 U	5E-04 U	0.001 U	9E-04 U

Notes:
Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
Non-detected values highlighted in blue exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram.
NA = Not analyzed
NV = No value available.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
E = The laboratory report noted that the internal standard associated with the analyte is out of control limits and the reported concentration is an estimate.
lc = The laboratory report noted that the presence of the compound indicated is likely due to laboratory contamination.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher

Table 24
Catch Basin Solids Sample Analytical Results - Dioxins/Furans
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Individual Dioxin/Furan Compounds																
			2,3,7,8-TCDD (mg/kg)	1,2,3,7,8-PeCDD (mg/kg)	1,2,3,4,7,8-HxCDD (mg/kg)	1,2,3,6,7,8-HxCDD (mg/kg)	1,2,3,7,8,9-HxCDD (mg/kg)	1,2,3,4,6,7,8-HpCDD (mg/kg)	OCDD (mg/kg)	2,3,7,8-TCDF (mg/kg)	1,2,3,7,8-PeCDF (mg/kg)	2,3,4,7,8-PeCDF (mg/kg)	1,2,3,4,7,8-HxCDF (mg/kg)	1,2,3,6,7,8-HxCDF (mg/kg)	2,3,4,6,7,8-HxCDF (mg/kg)	1,2,3,7,8,9-HxCDF (mg/kg)	1,2,3,4,6,7, 8-HpCDF (mg/kg)	1,2,3,4,7,8, 9-HpCDF (mg/kg)	OCDF (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
DP4CB4	DP4CB4-061013	6/10/2013	3.42E-06	1.51E-05	2.48E-05	5.11E-05	4.41E-05	1.20E-03	8.80E-03	8.29E-06	5.78E-06	1.30E-05	1.41E-05	1.45E-05	2.08E-05	1.95E-06 JT	2.12E-04	1.24E-05	4.37E-04
DP4CB4	DP4CB4-021314	2/13/2014	1.59E-09 JL	6.08E-09 JL	9.97E-09	2.02E-08	1.87E-08	4.65E-07	3.25E-06	4.94E-09	3.49E-09	7.34E-09	7.87E-09	8.84E-09	1.1E-08	1.24E-09 U	9.16E-08	5.19E-09	1.74E-07
DP6CB1	DP6CB1-060613	6/6/2013	3.45E-05	7.68E-05	7.84E-05	2.06E-04	2.37E-04	5.89E-03 E	2.87E-02 E	2.64E-06	2.50E-06	5.23E-06	6.25E-06	7.41E-06	1.12E-05	8.44E-08 U	9.12E-05	6.78E-06	1.28E-04

Location	Sample ID	Sample Date	Total Dioxin/Furan Compounds								Toxicity Equivalence	
			Total TCDD (mg/kg)	Total PeCDD (mg/kg)	Total HxCDD (mg/kg)	Total HpCDD (mg/kg)	Total TCDF (mg/kg)	Total PeCDF (mg/kg)	Total HxCDF (mg/kg)	Total HpCDF (mg/kg)	2,3,7,8-TCDD TEQ (U = 1/2 MRL) (mg/kg)	2,3,7,8-TCDD TEQ (U = 0) (mg/kg)
Preliminary Catch Basin Solids Screening Levels[a] (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**2.20E-06**	**2.20E-06**
2013 Laboratory Practical Quantitation Limits (mg/kg)			**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**1.20E-07**	**1.20E-07**
DP4CB4	DP4CB4-061013	6/10/2013	4.60E-05	1.49E-04	5.50E-04	2.63E-03	1.70E-04	2.19E-04	3.62E-04	5.20E-04	**5.77E-05**	**5.77E-05**
DP4CB4	DP4CB4-021314	2/13/2014	1.04E-06	2.18E-07	2.59E-07	1.58E-07	5.13E-08	1.2E-07	2.59E-08	1.11E-07	**1.80E-06**	**1.71E-06**
DP6CB1	DP6CB1-060613	6/6/2013	1.15E-04	3.51E-04	2.39E-03	1.07E-02	4.57E-05	8.19E-05	1.98E-04	2.41E-04	**2.36E-04**	**2.36E-04**

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels
NV = No available value.
mg/kg = milligrams per kilogram.
U = The laboratory report noted that the analyte was not detected at or above the reported result
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range
JT = The laboratory report noted that the analyte was positively identified and the reported result is an estimate below the associated quantitation limit, but above the method detection lim
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher

SAMPLE RESULTS-CONVENTIONALS
WT61-Friedman & Bruya

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: MB
Reported: 07/03/13

Project: NA
Event: 306117
Date Sampled: 06/06/13
Date Received: 06/11/13

Client ID: DP2CB5-060613
ARI ID: 13-12497 WT61A

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	58.87
Total Organic Carbon	07/02/13 070213#1	EPA 9060M	Percent	0.176	7.90

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT61-Friedman & Bruya

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: NB
Reported: 07/03/13

Project: NA
Event: 306117
Date Sampled: 06/06/13
Date Received: 06/11/13

Client ID: DP3CB1-060613
ARI ID: 13-12498 WT61B

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	80.00
Total Organic Carbon	07/02/13 070213#1	EPA 9060M	Percent	0.156	5.54

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT61-Friedman & Bruya

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized
Reported: 07/03/13

Project: NA
Event: 306117
Date Sampled: 06/06/13
Date Received: 06/11/13

Client ID: DP10CB1-060613
ARI ID: 13-12499 WT61C

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	77.38
Total Organic Carbon	07/02/13 070213#1	EPA 9060M	Percent	0.200	4.76

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT61-Friedman & Bruya

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: DB
Reported: 07/03/13

Project: NA
Event: 306117
Date Sampled: 06/06/13
Date Received: 06/11/13

Client ID: DP6CB1-060613
ARI ID: 13-12500 WT61D

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	69.25
Total Organic Carbon	07/02/13 070213#1	EPA 9060M	Percent	0.240	6.68

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT61-Friedman & Bruya

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: MB
Reported: 07/03/13

Project: NA
Event: 306117
Date Sampled: 06/06/13
Date Received: 06/11/13

Client ID: DP3CB3-060613
ARI ID: 13-12501 WT61E

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	29.16
Total Organic Carbon	07/02/13 070213#1	EPA 9060M	Percent	0.174	33.8

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: MB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/10/13
Date Received: 06/13/13

Client ID: DP4CB4-061013
ARI ID: 13-12730 WT94A

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	29.25
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.200	10.2

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized:
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/10/13
Date Received: 06/13/13

Client ID: DP6CB4-061013
ARI ID: 13-12731 WT94B

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	43.09
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.020	5.29

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: NB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/10/13
Date Received: 06/13/13

Client ID: DP1CB3-061013
ARI ID: 13-12732 WT94C

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	44.39
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.200	19.1

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized:
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/11/13
Date Received: 06/13/13

Client ID: DP1CB2-061113
ARI ID: 13-12733 WT94D

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	65.54
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.198	19.9

RL Analytical reporting limit
U Undetected at reported detection limit

WT94 : 000016

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: DB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/11/13
Date Received: 06/13/13

Client ID: DP2CB2-061113
ARI ID: 13-12734 WT94E

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	61.87
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.020	6.24

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: NB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/11/13
Date Received: 06/13/13

Client ID: DP4CB2-061113
ARI ID: 13-12735 WT94F

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	46.51
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.020	12.0

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: JB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/11/13
Date Received: 06/13/13

Client ID: DP5CB1-061113
ARI ID: 13-12736 WT94G

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	50.38
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.020	10.8

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WT94-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized: MB
Reported: 07/03/13

Project: NA
Event: 306182
Date Sampled: 06/11/13
Date Received: 06/13/13

Client ID: DP5CB4-061113
ARI ID: 13-12737 WT94H

Analyte	Date	Method	Units	RL	Sample
Total Solids	06/17/13 061713#1	SM2540B	Percent	0.01	60.92
Total Organic Carbon	07/03/13 070313#1	EPA 9060M	Percent	0.020	8.61

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XZ76-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized:
Reported: 02/20/14

Project: NA
Event: 402176
Date Sampled: 02/13/14
Date Received: 02/18/14

Client ID: DP4CB4-021314
ARI ID: 14-2686 XZ76A

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/19/14 021914#1	SM2540G	Percent	0.01	40.33
Total Organic Carbon	02/20/14 022014#1	EPA 9060M	Percent	0.198	9.27

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XZ76-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Solid
Data Release Authorized:
Reported: 02/20/14

Project: NA
Event: 402176
Date Sampled: 02/13/14
Date Received: 02/18/14

Client ID: DP6CB4-021314
ARI ID: 14-2687 XZ76B

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/19/14 021914#1	SM2540G	Percent	0.01	33.23
Total Organic Carbon	02/20/14 022014#1	EPA 9060M	Percent	0.196	8.94

RL Analytical reporting limit
U Undetected at reported detection limit

INTERTIDAL SEDIMENT SAMPLES

Table 32
Intertidal Sediment Sample Analytical Results - Metals
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**7.30**	**3.10**	**540**	**NV**	**3.70**	**35.6**	**310**	**40**	**0.41**	**140**	**3.0**	**6.1**	**0.52**	**410**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**0.11**	**0.42**	**0.052**	**NV**	**0.2**	**0.47**	**0.071**	**0.05**	**0.002**	**0.21**	**0.91**	**0.079**	**0.044**	**0.97**
IS-1	IS-1	7/23/2013	0 - 3	**13.5**	**28.6**	73.8	0.86 U	0.2 U	**45.7**	88.6	27.4	0.13	49	0.92 U	0.78 U	0.044 U	145
IS-2	IS-2	7/23/2013	0 - 3	3.3	**26.2**	81.2	0.86 U	2 U	**40.3**	88.7	**74.5**	0.1	27.7	0.92 U	0.78 U	0.44 U	388
IS-3	IS-3	7/23/2013	0 - 3	1.06 U	**19**	86	0.86 U	2 U	33.6	68.5	**45.7**	0.13	23.8	0.92 U	0.78 U	0.44 U	209
IS-4	IS-4	7/23/2013	0 - 3	5.67	**30**	96.7	0.86 U	2 U	**38.8**	110	**96.5**	0.16	29.8	0.92 U	0.78 U	0.044 U	398
IS-5	IS-5	7/24/2013	0 - 3	1.06 U	**17.9**	56.7	0.86 U	2.04 U	**35.8**	128	**71.1**	0.11	37.6	0.92 U	0.78 U	0.044 U	249

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary sediment screening levels.
Non-detecteded values highlighted in blue exceed the preliminary sediment screening levels.
mg/kg = milligrams per kilogram.
NV = No available value.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 33
Intertidal Sediment Sample Analytical Results - PAHs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benz[a]anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**0.5**	**0.56**	**0.96**	**0.062**	**0.062**	**0.062**	**0.67**	**0.062**	**0.062**	**0.062**	**1.7**	**0.54**	**0.062**	**2.1**	**1.5**	**2.6**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**0.00014**	**0.00009**	**0.00009**	**0.0002**	**0.0002**	**0.0002**	**0.0003**	**0.0004**	**0.0002**	**0.0003**	**0.0003**	**0.0002**	**0.0006**	**0.0002**	**0.0003**	**0.0003**
IS-1	IS-1	7/23/2013	0 - 3	0.007 U	0.0046 U	0.036	**0.24**	**0.17**	**0.28**	0.089	**0.13**	**0.33**	0.027	0.54	0.0078	**0.11**	0.011 U	0.11	0.51
IS-2	IS-2	7/23/2013	0 - 3	0.007 U	0.0093	0.043	**0.13**	**0.099**	**0.27**	0.068	**0.074**	**0.2**	0.017 U	0.32	0.012	**0.078**	0.011 U	0.13	0.31
IS-3	IS-3	7/23/2013	0 - 3	0.0082	0.013	0.038	**0.13**	**0.093**	**0.24**	0.074	**0.079**	**0.28**	0.017 U	0.42	0.0096	**0.079**	0.011 U	0.11	0.34
IS-4	IS-4	7/23/2013	0 - 3	0.01	0.018	0.056	**0.16**	**0.16**	**0.33**	0.17	**0.11**	**0.33**	0.034	0.52	0.011	**0.17**	0.011 U	0.24	0.49
IS-5	IS-5	7/24/2013	0 - 3	0.007 U	0.018	0.038	**0.13**	**0.18**	**0.38**	0.19	**0.11**	**0.27**	0.037	0.25	0.0075 U	**0.19**	0.011 U	0.082	0.23

Notes:
Detected values in bold and highlighted in yellow exceed the preliminary sediment screening levels.
mg/kg = milligrams per kilogram
U = The laboratory report noted that the analyte was not detected at or above the reported result.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 34
Intertidal Sediment Sample Analytical Results - PCBs and Petroleum Hydrocarbons
8th Avenue Terminals, Inc. Site
Seattle, Washington

				PCBs									Petroleum Hydrocarbons	
Location	Sample ID	Sample Date	Sample Depth (Inches)	Aroclor 1016 (mg/kg)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Total PCBs (U=1/2 MRL) (mg/kg)	Total PCBs (U=0) (mg/kg)	Diesel Range Organics (mg/kg)	Heavy Oil Range Organics (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.23**	**0.23**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.23**	**0.23**	**NV**	**NV**
IS-1	IS-1	7/23/2013	0 - 3	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.16	0.19			38	230
IS-2	IS-2	7/23/2013	0 - 3	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.09	0.13		0.22	740	6,100
IS-3	IS-3	7/23/2013	0 - 3	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.18	0.2			100	640
IS-4	IS-4	7/23/2013	0 - 3	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.34 E	0.56 E		E	63	470
IS-5	IS-5	7/24/2013	0 - 3	0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	0.25	0.24			49	320

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary sediment screening levels.
mg/kg = milligrams per kilogram.
NV = No available value.
MRL = Method reporting limit.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 35
Intertidal Sediment Sample Analytical Results - Phenols
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	2,4,5-Trichlorophenol (mg/kg)	2,4,6-Trichlorophenol (mg/kg)	2,4-Dichlorophenol (mg/kg)	2,4-Dimethylphenol (mg/kg)	2,4-Dinitrophenol (mg/kg)	2-Chlorophenol (mg/kg)	2-Nitrophenol (mg/kg)	3-Methylphenol and 4-Methylphenol coelution (mg/kg)	4,6-Dinitro-2-Methylphenol (mg/kg)	4-Chloro-3-methylphenol (mg/kg)	4-Nitrophenol (mg/kg)	2-Methylphenol(o-Cresol) (mg/kg)	Pentachlorophenol (mg/kg)	Phenol (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**NV**	**NV**	**NV**	**0.029**	**NV**	**NV**	**NV**	**0.67**	**NV**	**NV**	**NV**	**0.063**	**0.36**	**0.42**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**0.0097**	**0.0081**	**0.0058**	**0.0186**	**0.0139**	**0.0061**	**0.0083**	**0.0145**	**0.0106**	**0.0045**	**0.0177**	**0.0065**	**0.0062**	**0.0054**
IS-1	IS-1	7/23/2013	0 - 3	0.01 U	0.008 U	0.006 U	0.019 U	0.014 U	0.006 U	0.008 U	0.014 U	0.011 U	0.004 U	0.018 U	0.006 U	0.024 E	0.27 U
IS-2	IS-2	7/23/2013	0 - 3	0.01 U	0.008 U	0.006 U	0.019 U	0.014 U	0.006 U	0.008 U	0.014 U	0.011 U	0.004 U	0.018 U	0.006 U	0.031 E	0.057
IS-3	IS-3	7/23/2013	0 - 3	0.01 U	0.008 U	0.006 U	0.019 U	0.014 U	0.006 U	0.008 U	0.014 U	0.011 U	0.004 U	0.018 U	0.006 U	0.033 E	0.27 U
IS-4	IS-4	7/23/2013	0 - 3	0.48 U	0.4 U	0.29 U	0.93 U	0.69 U	0.31 U	0.41 U	0.72 U	0.53 U	0.22 U	0.89 U	0.32 U	0.31 U	0.27 U
IS-5	IS-5	7/24/2013	0 - 3	0.01 U	0.008 U	0.006 U	0.019 U	0.014 U	0.006 U	0.008 U	0.014 U	0.011 U	0.004 U	0.018 U	0.006 U	0.018 E	0.005 U

Notes:

Non-detected values highlighted in blue exceed the preliminary sediment screening levels.

mg/kg = milligrams per kilogram.

NV = No value available.

U = The laboratory report noted that the analyte was not detected at or above the reported result.

E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.

[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 36
Intertidal Sediment Sample Analytical Results - Phthalates
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	Bis(2-ethylhexyl) phthalate (mg/kg)	Butyl benzyl phthalate (mg/kg)	Dibutyl phthalate (mg/kg)	Diethyl phthalate (mg/kg)	Dimethyl phthalate (mg/kg)	Di-n-octyl phthalate (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**1.3**	**0.063**	**1.4**	**0.2**	**0.071**	**6.2**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**0.014**	**0.0058**	**0.02**	**0.0041**	**0.0012**	**0.0033**
IS-1	IS-1	7/23/2013	0 - 3	**1.4** E	0.024	0.02 U	0.012	0.06 U	0.0032 U
IS-2	IS-2	7/23/2013	0 - 3	0.55	**0.082**	0.069	0.055	0.017	0.0032 U
IS-3	IS-3	7/23/2013	0 - 3	0.86 E	0.04	0.037	0.076	0.06 U	0.0032 U
IS-4	IS-4	7/23/2013	0 - 3	0.67 U	0.29 U	1 U	0.2 U	0.06 U	0.16 U
IS-5	IS-5	7/24/2013	0 - 3	0.4	0.044	0.02 U	0.016	0.0076	0.0032 U

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary sediment screening levels.
Non-detected values highlighted in blue exceed the preliminary sediment screening levels.
mg/kg = milligrams per kilogram.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
E = The laboratory report noted that the reported result is an estimate because it exceeds calibration range.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 37
Intertidal Sediment Sample Analytical Results - SVOCs
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	1,2,4-Trichlorobenzene (mg/kg)	1,2-Dichlorobenzene (mg/kg)	1,3-Dichlorobenzene (mg/kg)	1,4-Dichlorobenzene (mg/kg)	2,4-Dinitrotoluene (mg/kg)	2,6-Dinitrotoluene (mg/kg)	2-Chloronaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	2-Nitroaniline (mg/kg)	4-Bromophenyl phenyl ether (mg/kg)	4-Chloroaniline (mg/kg)	4-Chlorophenyl-Phenylether (mg/kg)	4-Nitroaniline (mg/kg)	Benzoic acid (mg/kg)	Benzyl alcohol (mg/kg)	Bis(2-chloroethoxy)methane (mg/kg)	Bis(2-Chloroethyl)Ether (mg/kg)	Bis(2-chloroisopropyl) ether (mg/kg)	Carbazole (mg/kg)	Dibenzofuran (mg/kg)	Hexachlorobenzene (mg/kg)	Hexachlorobutadiene (mg/kg)	Hexachlorocyclopentadiene (mg/kg)	Hexachloroethane (mg/kg)	Isophorone (mg/kg)	m-Nitroaniline (mg/kg)	Nitrobenzene (mg/kg)	N-Nitrosodi-n-propylamine (mg/kg)	N-Nitrosodiphenylamine (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**0.031**	**0.035**	**0.17**	**0.11**	**NV**	**NV**	**NV**	**0.67**	**NV**	**NV**	**NV**	**NV**	**NV**	**0.65**	**0.057**	**NV**	**NV**	**NV**	**NV**	**0.54**	**0.022**	**0.011**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**0.0034**	**0.004**	**0.0027**	**0.0024**	**0.0016**	**0.0019**	**0.0014**	**0.001**	**0.0026**	**0.0016**	**0.18**	**0.0016**	**0.0182**	**0.055**	**0.00051**	**0.0014**	**0.0016**	**0.0016**	**0.002**	**0.001**	**0.001**	**0.002**	**0.0022**	**0.0033**	**0.0011**	**0.0173**	**0.0026**	**0.0031**	**0.0048**
IS-1	IS-1	7/23/2013	0 - 3	0.0034 U	0.004 U	0.0026 U	0.0024 U	0.0016 U	0.0019 U	0.0014 U	0.0058	0.0026 U	0.0016 U	0.18 U	0.0016 U	0.018 U	0.054 U	0.25 U	0.0014 U	0.0016 U	0.0016 U	0.1 U	0.0067	0.001 U	0.002 U	0.0022 U	0.0032 U	0.0011 U	0.017 U	0.0026 U	0.003 U	0.001 U
IS-2	IS-2	7/23/2013	0 - 3	0.0034 U	0.004 U	0.0026 U	0.0024 U	0.0016 U	0.0019 U	0.0014 U	0.011	0.0026 U	0.0016 U	0.18 U	0.0016 U	0.018 U	0.054 U	0.028	0.0014 U	0.0016 U	0.0016 U	0.087	0.018	0.001 U	0.002 U	0.0022 U	0.0032 U	0.0011 U	0.017 U	0.0026 U	0.003 U	0.001 U
IS-3	IS-3	7/23/2013	0 - 3	0.0034 U	0.004 U	0.0026 U	0.0024 U	0.0016 U	0.0019 U	0.0014 U	0.0044	0.0026 U	0.0016 U	0.18 U	0.0016 U	0.018 U	0.063	0.25 U	0.0014 U	0.0016 U	0.0016 U	0.1 U	0.0064	0.001 U	0.002 U	0.0022 U	0.0032 U	0.0011 U	0.017 U	0.0026 U	0.003 U	0.001 U
IS-4	IS-4	7/23/2013	0 - 3	0.17 U	0.2 U	0.13 U	0.12 U	0.079 U	0.094 U	0.072 U	0.051 U	0.13 U	0.082 U	8.9 U	0.079 U	0.91 U	2.7 U	0.25 U	0.072 U	0.079 U	0.079 U	0.1 U	0.051 U	0.051 U	0.1 U	0.11 U	0.16 U	0.056 U	0.87 U	0.13 U	0.15 U	0.051 U
IS-5	IS-5	7/24/2013	0 - 3	0.0034 U	0.004 U	0.0026 U	0.0024 U	0.0016 U	0.0019 U	0.0014 U	0.005	0.0026 U	0.0016 U	0.18 U	0.0016 U	0.018 U	0.056	0.012	0.0014 U	0.0016 U	0.0016 U	0.024	0.0063	0.001 U	0.002 U	0.0022 U	0.0032 U	0.0011 U	0.017 U	0.0026 U	0.003 U	0.0015

Notes:

Non-detected values highlighted in blue exceed the preliminary sediment screening levels

mg/kg = milligrams per kilogram

U = The laboratory report noted that the analyte was not detected at or above the reported resul

[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

Table 38
Intertidal Sediment Sample Analytical Results - Dioxins/Furans
8th Avenue Terminals, Inc. Site
Seattle, Washington

Location	Sample ID	Sample Date	Sample Depth (Inches)	Individual Dioxin/Furan Compounds																
				2,3,7,8-TCDD (mg/kg)	1,2,3,7,8-PeCDD (mg/kg)	1,2,3,4,7,8-HxCDD (mg/kg)	1,2,3,6,7,8-HxCDD (mg/kg)	1,2,3,7,8,9-HxCDD (mg/kg)	1,2,3,4,6,7,8-HpCDD (mg/kg)	OCDD (mg/kg)	2,3,7,8-TCDF (mg/kg)	1,2,3,7,8-PeCDF (mg/kg)	2,3,4,7,8-PeCDF (mg/kg)	1,2,3,4,7,8-HxCDF (mg/kg)	1,2,3,6,7,8-HxCDF (mg/kg)	2,3,4,6,7,8-HxCDF (mg/kg)	1,2,3,7,8,9-HxCDF (mg/kg)	1,2,3,4,6,7,8-HpCDF (mg/kg)	1,2,3,4,7,8,9-HpCDF (mg/kg)	OCDF (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**
IS-1	IS-1	7/23/2013	0 - 3	5.03E-07 EMPC	1.93E-06 JT	3.62E-06	1.09E-05	7.83E-06	3.33E-04	3.35E-03	2.31E-06	2.08E-06 JT	4.13E-06	6.12E-06	2.99E-06	3.69E-06	2.00E-07 U	4.70E-05	4.11E-06	1.48E-04
IS-2	IS-2	7/23/2013	0 - 3	8.54E-07	3.22E-06	6.38E-06	2.41E-05	1.29E-05	8.03E-04	7.37E-03	2.31E-06	2.18E-06 JT	5.57E-06	8.56E-06	4.94E-06	7.03E-06	2.14E-07 U	1.30E-04	1.80E-05	8.04E-04
IS-3	IS-3	7/23/2013	0 - 3	5.02E-07 EMPC	2.17E-06 JT	3.75E-06	1.37E-05	7.39E-06	3.99E-04	3.39E-03	2.03E-06	1.64E-06 JT	4.14E-06	6.53E-06	3.47E-06	4.56E-06	1.66E-07 U	6.36E-05	5.09E-06	2.40E-04
IS-4	IS-4	7/23/2013	0 - 3	9.17E-07	3.62E-06 EMPC	8.08E-06	2.53E-05	1.31E-06	8.23E-04	8.11E-03	4.93E-06	4.75E-06	8.04E-06	1.02E-05	6.00E-06	7.48E-06	2.24E-07 U	1.04E-04	8.13E-06	3.35E-04
IS-5	IS-5	7/24/2013	0 - 3	1.12E-06	3.19E-06	6.26E-06	1.72E-05	1.09E-05	4.89E-04	3.82E-03	5.09E-06	2.93E-06	7.45E-06	1.11E-05	5.98E-06	6.57E-06	2.04E-07 U	7.70E-05	6.56E-06	2.48E-04

Location	Sample ID	Sample Date	Sample Depth (Inches)	Total Dioxin/Furan Compounds								Toxicity Equivalence	
				Total TCDD (mg/kg)	Total PeCDD (mg/kg)	Total HxCDD (mg/kg)	Total HpCDD (mg/kg)	Total TCDF (mg/kg)	Total PeCDF (mg/kg)	Total HxCDF (mg/kg)	Total HpCDF (mg/kg)	2,3,7,8-TCDD TEQ (U = 1/2 MRL) (mg/kg)	2,3,7,8-TCDD TEQ (U = 0) (mg/kg)
Preliminary Sediment Screening Levels[a] (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**2.20E-06**	**2.20E-06**
2013 Laboratory Practical Quantitation Limits (mg/kg)				**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**1.20E-07**	**1.20E-07**
IS-1	IS-1	7/23/2013	0 - 3	5.71E-06	1.70E-05	1.19E-05	1.13E-03	3.80E-05	4.26E-04	7.98E-04	1.50E-04	**1.19E-05**	**1.19E-05**
IS-2	IS-2	7/23/2013	0 - 3	9.07E-06	2.14E-05	2.18E-04	2.38E-03	3.84E-05	6.07E-05	1.70E-04	5.24E-04	**2.43E-05**	**2.43E-05**
IS-3	IS-3	7/23/2013	0 - 3	6.87E-06	1.75E-05	1.21E-04	1.06E-03	3.49E-05	4.39E-05	1.01E-04	2.24E-04	**1.34E-05**	**1.34E-05**
IS-4	IS-4	7/23/2013	0 - 3	1.49E-05	2.56E-05	2.56E-04	2.82E-03	7.33E-05	8.94E-05	1.68E-04	3.49E-04	**2.30E-05**	**2.29E-05**
IS-5	IS-5	7/24/2013	0 - 3	1.10E-05	2.40E-05	1.61E-04	1.26E-03	6.63E-05	7.54E-05	1.33E-04	2.38E-04	**1.99E-05**	**1.99E-05**

Notes:

Detected values in bold and highlighted in yellow exceed the preliminary catch basin solids screening levels.
mg/kg = milligrams per kilogram.
NV = No available value.
U = The laboratory report noted that the analyte was not detected at or above the reported result.
JT = The laboratory report noted that the analyte was positively identified and the reported result is an estimate below the associated quantitation limit, but above the method detection limit.
EMPC = The laboratory report noted that the signal/noise ratio was not sufficient for peak identification or there was a co-eluting interference.
[a] Preliminary screening levels are based on the most stringent potential ARARs for the site, or the practical quantitation limit (PQL), whichever is higher.

SAMPLE RESULTS-CONVENTIONALS
WY49-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/02/13

Project: NA
Event: 307331
Date Sampled: 07/23/13
Date Received: 07/24/13

Client ID: IS-1
ARI ID: 13-15490 WY49A

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/25/13 072513#1	SM2540B	Percent	0.01	42.28
Total Organic Carbon	08/02/13 080213#1	EPA 9060M	Percent	0.020	3.62

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WY49-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized
Reported: 08/02/13

Project: NA
Event: 307331
Date Sampled: 07/23/13
Date Received: 07/24/13

Client ID: IS-2
ARI ID: 13-15491 WY49B

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/25/13 072513#1	SM2540B	Percent	0.01	55.98
Total Organic Carbon	08/02/13 080213#1	EPA 9060M	Percent	0.020	2.67

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
WY49-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/02/13

Project: NA
Event: 307331
Date Sampled: 07/23/13
Date Received: 07/24/13

Client ID: IS-3
ARI ID: 13-15492 WY49C

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/25/13 072513#1	SM2540B	Percent	0.01	46.00
Total Organic Carbon	08/02/13 080213#1	EPA 9060M	Percent	0.020	3.29

RL Analytical reporting limit
U Undetected at reported detection limit

WY49:00007

SAMPLE RESULTS-CONVENTIONALS
WY49-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized
Reported: 08/02/13

Project: NA
Event: 307331
Date Sampled: 07/23/13
Date Received: 07/24/13

Client ID: IS-4
ARI ID: 13-15493 WY49D

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/25/13 072513#1	SM2540B	Percent	0.01	49.89
Total Organic Carbon	08/02/13 080213#1	EPA 9060M	Percent	0.020	2.15

RL Analytical reporting limit
U Undetected at reported detection limit

WY49:00000

SAMPLE RESULTS-CONVENTIONALS
WY67-Friedman and Bruya, Inc

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/31/13

Project: NA
Event: 307357
Date Sampled: 07/24/13
Date Received: 07/25/13

Client ID: IS-5
ARI ID: 13-15593 WY67A

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/25/13 072513#1	SM2540B	Percent	0.01	45.58
Total Organic Carbon	07/29/13 072913#1	EPA 9060M	Percent	0.020	3.05

RL Analytical reporting limit
U Undetected at reported detection limit