SR 99: ALASKAN WAY VIADUCT & SEAWALL REPLACEMENT PROGRAM

Water Resources Technical Memorandum

S. Holgate Street to S. King Street Viaduct Replacement Project

Environmental Assessment

June 2008

TABLE OF CONTENTS

LIST OF EXHIBITS

ATTACHMENTS

ACRONYMS

BMP	Best Management Practice
City	City of Seattle
County	King County
CSL	Cleanup Screening Level
Cu	copper
EBI	Elliott Bay Interceptor
Ecology	Washington State Department of Ecology
EPA	(United States) Environmental Protection Agency
FHWA	Federal Highway Administration
Metro	Municipality of Metropolitan Seattle
MG	million gallons
NPL	National Priority List
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PGIS	pollutant-generating impervious surface
Project	SR 99: S. Holgate Street to S. King Street Viaduct Replacement Project
RCW	Revised Code of Washington
SR	State Route
TMDL	total maximum daily load
TSS	total suspended solids
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WWTP	Wastewater Treatment Plant
Zn	zinc

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Chapter 1 SUMMARY

This technical memorandum analyzes effects on water resources from the SR 99: S. Holgate Street to S. King Street Viaduct Replacement Project (the Project). The project area extends along the State Route (SR) 99 mainline from S. Walker Street on the south to S. King Street on the north. In general, the study area encompasses SR 99 within the project limits and receiving waters near the project corridor.

1.1 Affected Environment

The project area has been developed for over 100 years and is assumed to be 100 percent impervious. Stormwater runoff from the project area currently discharges directly into Elliott Bay and the Duwamish River or to the combined sewer system. Approximately 60 percent of the stormwater runoff from the project area is combined with sanitary sewer flows in the City of Seattle and King County wastewater conveyance systems for treatment at the West Point Wastewater Treatment Plant (WWTP) prior to discharge into Puget Sound. During a large storm event, stormwater in the combined sewer system is sometimes discharged directly to Elliott Bay as a combined sewer overflow.

Elliott Bay is listed on the Washington State Department of Ecology's (Ecology) 2004 303(d) list of impaired waters of the state (Ecology 2005a) for fecal coliform. The Duwamish River is listed for polycyclic aromatic hydrocarbons (PAHs) in fish tissue, and both these water bodies are also listed on Ecology's Category 5 303(d) list for sediment contamination for numerous parameters (Ecology 2005a), as described in Chapter 3, Affected Environment.

1.2 Operational Effects and Mitigation

As shown in Exhibit 1-1, compared to existing conditions, the Project would reduce pollutant loading and improve the quality of runoff from the project area that would be discharged to surface water. Based on the pollutant loading analysis, the Project would reduce total suspended solids (TSS), zinc (Zn), and copper (Cu) loading to Elliott Bay and the Duwamish River (see Exhibit 1-1).

Exhibit 1-1. Summary of Pollutant Loading (Pounds per Year)[1]

Receiving Water	Pollutant[2]	Existing Conditions	Build Alternative
Duwamish River/ Elliott Bay	TSS	7,733	1,742
	Total Copper	2.74	1.35
	Dissolved Copper	0.73	0.62
	Total Zinc	15.05	6.25
	Dissolved Zinc	5.47	3.73
Puget Sound[3]	TSS	570	466
	Total Copper	1.63	1.33
	Dissolved Copper	0.89	0.73
	Total Zinc	6.57	5.36
	Dissolved Zinc	6.73	5.49

[1] Pollutant loading calculations are based on the assumption that all existing and proposed project surfaces are pollution-generating.
[2] Total suspended solids (TSS) are rounded to the nearest pound; zinc and copper are rounded to the nearest hundredth of a pound.
[3] Discharged at the West Point Wastewater Treatment Plant outfall.

1.3 Construction Effects and Mitigation

Construction activities, such as grading, dewatering, and soil improvement, could result in temporary effects on water quality, such as an increase in turbidity or exposure to spills. Best Management Practices (BMPs) would be used during construction to minimize or prevent temporary effects.

Chapter 2 METHODOLOGY

This chapter describes the methods used to (1) characterize water resources in the affected environment for pre- and post-project conditions, (2) identify and analyze operational effects, and (3) identify and analyze construction effects.

2.1 Characterizing the Affected Environment

Historical water quality and sediment information was obtained from existing data to characterize the affected environment. These data were obtained from standard literature databases (Aquatic Sciences and Fisheries Abstracts, Current Contents), library catalogs (University of Washington), website searches, municipality or agency data (Seattle Public Utilities, King County, and Ecology), and the National Oceanic and Atmospheric Administration's (NOAA) Elliott Bay/Duwamish River Natural Resource Damage Assessment and Restoration Planning website.

Because the Project is located adjacent to Elliott Bay, a marine water body, there are no floodplains in the project area. Therefore, floodplain elements of the affected environment were not characterized or included in this technical memorandum.

2.2 Identifying Operational Effects

Operational effects to water quality were identified through a review of literature and agency manuals relevant to highway stormwater runoff. The manuals reviewed included the following:

- September 2007 *Environmental Procedures Manual* (WSDOT 2007a)
- May 2006 *Highway Runoff Manual* (WSDOT 2006)
- February 2005 Ecology *Stormwater Management Manual for Western Washington* (Ecology 2005b)
- City of Seattle Director's Orders Title 22.800, Stormwater Grading and Drainage Control Code (City of Seattle 2000)

The Project would not increase impervious surfaces, so there would be no change in the volume of stormwater runoff from the project area. Therefore, operational effects from increased stormwater runoff volumes were not evaluated.

2.3 Developing the Stormwater Management Approach

The stormwater management approach for the Project was developed by the project design team and coordinated with the City of Seattle through evaluation of engineering considerations and feasibility issues as well as geographical location along the corridor. Several documents, including project design memorandums, preliminary design plans, the WSDOT Hydraulics Manual (WSDOT 2007b) and Highway Runoff Manual (WSDOT 2006), and Seattle Public Utilities policy memorandums, were reviewed to develop the stormwater management approach used for the Project.

2.4 Analyzing Pollutant Loads

A pollutant loading analysis was conducted to evaluate changes in chemical inputs to receiving waters in the project area resulting from stormwater discharges from the Build Alternative. Baseline inputs were estimated for existing, untreated, pollutant-generating impervious surfaces (PGIS) for comparison with future inputs from the Project. For this analysis, three pollutants were evaluated because of their presence in highway stormwater runoff and their potential to affect aquatic species in receiving waters. These pollutants were TSS, dissolved and total copper, and dissolved and total zinc.

A pollutant loading spreadsheet, developed with Washington State Department of Transportation (WSDOT) data, using the Federal Highway Administration (FHWA) method (Method 1 in the *Environmental Procedures Manual*), was used to evaluate pre- and post-project conditions for separated stormwater basin areas. A similar method was used to calculate pollutant loading from project areas that are connected to the combined sewer system. These pollutant loads were also included in the overall pollutant loading evaluation. The pollutant loading results are presented in Attachment A.

2.5 Analyzing Construction Effects

Construction effects were evaluated by reviewing the documents listed in Section 2.2, project plans, and preliminary information from the design team on construction methods and sequencing.

Chapter 3 AFFECTED ENVIRONMENT

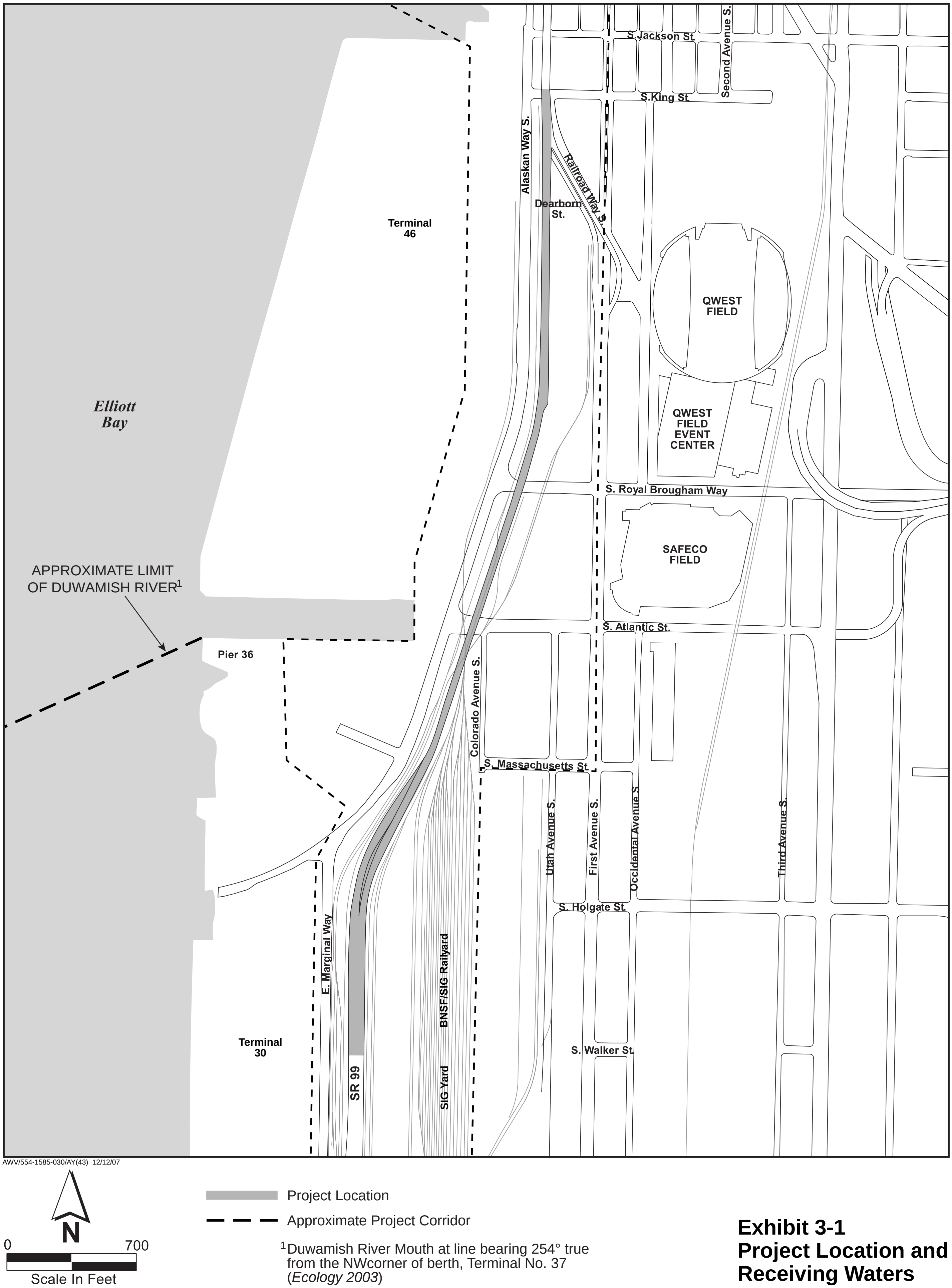
This chapter describes both the built and the natural environments that could potentially be affected by the construction or operation of the proposed Build Alternative. Specifically, this chapter describes the existing water and nearshore sediment quality of the water bodies that receive runoff from the project area and identifies locations where the natural environment may be more susceptible to temporary or long-term effects.

3.1 Overview of Project Area Stormwater Drainage System

The project area is part of the highly developed downtown urban corridor along the Elliott Bay waterfront (Exhibit 3-1). The project area has been developed for over 100 years and is assumed to be 100 percent impervious. Development and associated activities have degraded the water quality and nearshore sediments of receiving water bodies surrounding the project area, including Elliott Bay and the Duwamish River. Specific sources of pollutants in the project area include discharges from industrial facilities, combined sewer overflows, hazardous material spills, contaminated groundwater, and urban runoff (Ecology 1995a).

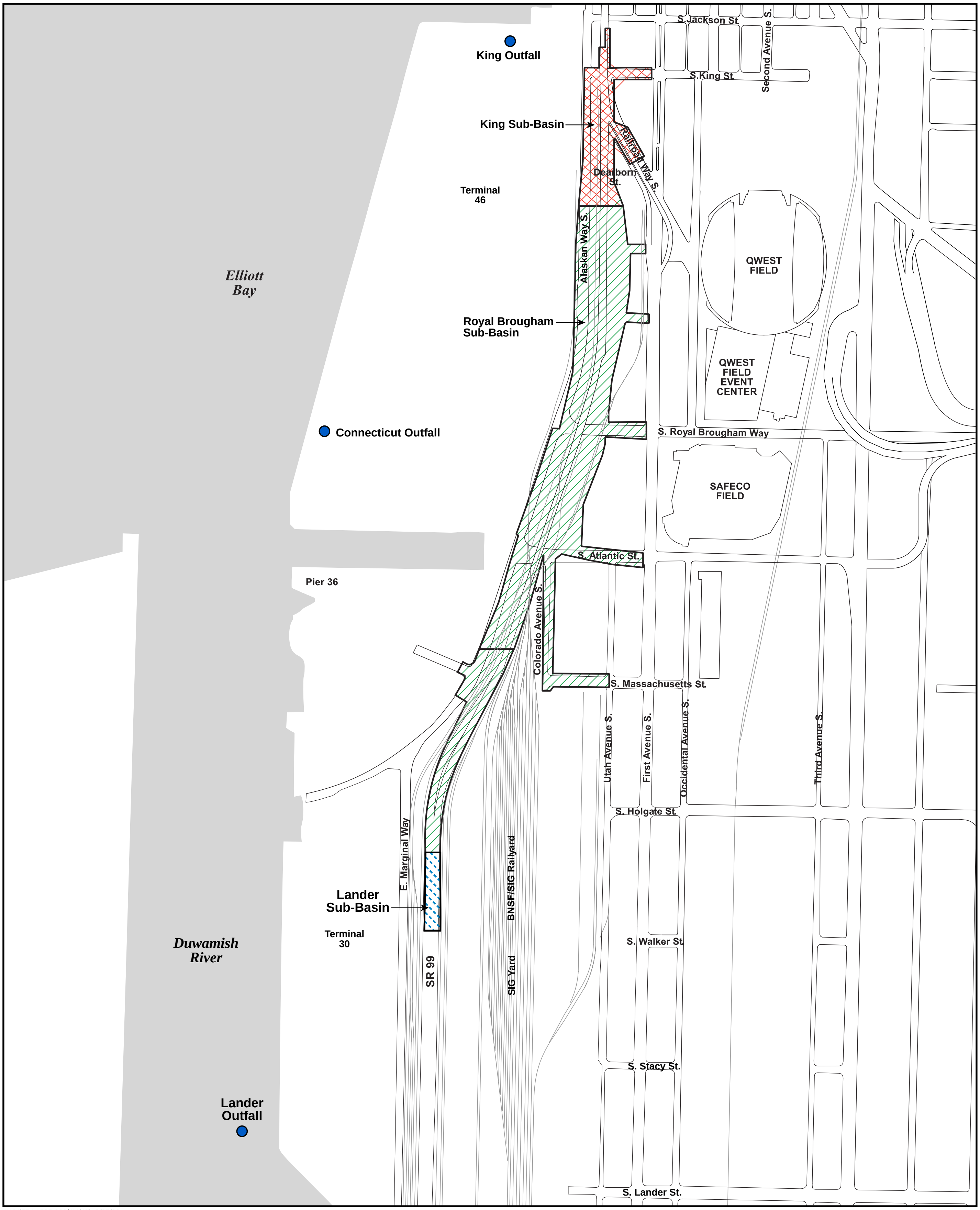
Historically, a combined drainage system was built in Seattle to collect both sanitary sewage and stormwater in a single pipe and convey it untreated to a discharge location. In 1958, the Municipality of Metropolitan Seattle (Metro) was formed under the Comprehensive Sewer Plan and work began to reduce the annual volume of untreated sanitary and combined sewage discharge to surface waters in King County. Seattle has had an active plan since the 1970s to reduce the number of combined sewer overflows. Metro completed a variety of projects (including treatment plants, interceptor pipes, regulators, and separation projects) to reduce the volume and frequency of combined sewer overflows. As part of this program, the City and Metro constructed several projects within the project area that have reduced the frequency and volume of remaining combined sewer overflows. The goal of these projects and others outlined in the *Final 1988 Combined Sewer Overflow Control Plan* is to reduce the total volume and frequency of untreated combined sewer overflows (Metro 1988a). The combined sewer overflow plan was updated in 2001.

The project area covers approximately 30.6 acres, and runoff from the project area drains to three sub-basins, Lander, King, and Royal Brougham (Exhibit 3-2). These sub-basins are part of larger complex basins that drain most of Seattle (Exhibit 3-3). Stormwater runoff from the project area either discharges to the Duwamish River or Elliott Bay, or to the combined sewer system.



[1]Duwamish River Mouth at line bearing 254° true from the NWcorner of berth, Terminal No. 37 (*Ecology 2003*)

Exhibit 3-1
Project Location and Receiving Waters



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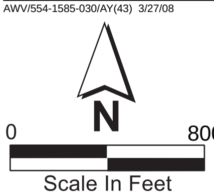

Sub-Basin Boundary

Major Outfall

Exhibit 3-2
Sub-basins within the Project Area

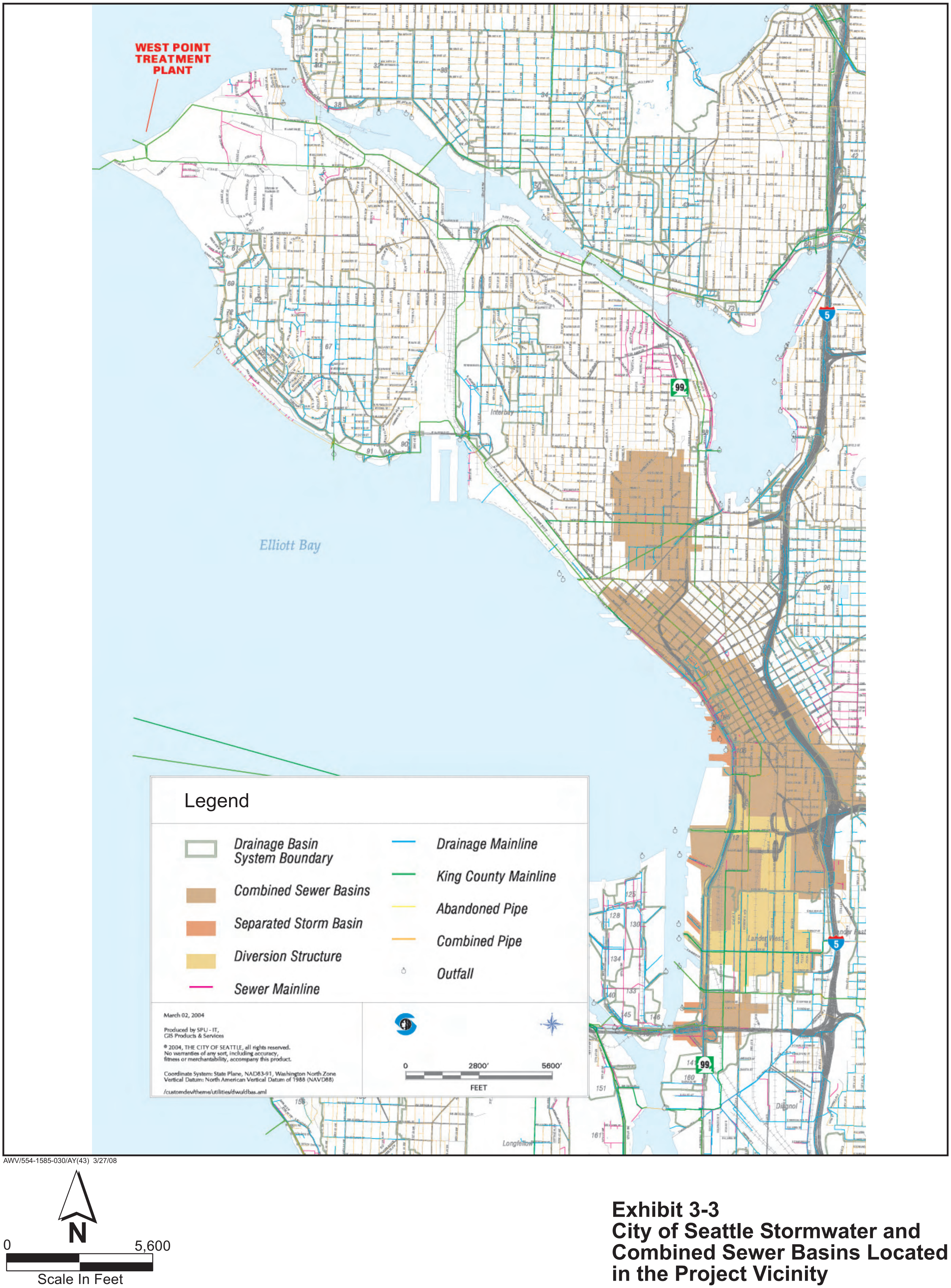

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Exhibit 3-3
City of Seattle Stormwater and Combined Sewer Basins Located in the Project Vicinity

Stormwater from the project area is currently collected in a complex system of pipes that are owned privately or by municipalities (King County or the City of Seattle). These pipes do one of three things:

1. Collect stormwater from the existing impervious surfaces within the project area and convey it to an outfall, where it is discharged without treatment.
2. Collect stormwater from the existing project area impervious surfaces and convey it to a diversion structure, which diverts the first flush (approximately 10 percent of the annual runoff volume) of stormwater to the combined sewer system where it is conveyed to the West Point WWTP and treated prior to discharge. The remainder of the annual stormwater volume is discharged as stormwater to the Duwamish River or Elliott Bay.
3. Collect stormwater from the existing project area and convey it to the combined sewer system, where it is conveyed to the West Point WWTP or discharged as a combined sewer overflow at a King County combined sewer outfall.

The existing and proposed stormwater management approaches for the project area sub-basins are summarized in Exhibit 3-4.

Exhibit 3-4. Project Area Sub-basins and Stormwater Management Approaches

Sub-basin	Area (acres)	Existing Stormwater Management Approach	Proposed Stormwater Management Approach
Lander	1.4	1.4 acres untreated; to Elliott Bay/Duwamish River	1.4 acres retrofit with treatment BMPs
Royal Brougham	23.2	11.1 acres untreated; convey to low-flow diversion[1]	14.6 acres retrofit with treatment BMPs; convey to low-flow diversion[1]
		12.1 acres untreated; convey to combined sewer	8.6 acres untreated; retrofit with detention BMPs; convey to combined sewer
King	6.0	6.0 acres untreated; convey to combined sewer	6.0 acres untreated; retrofit with detention BMPs; convey to combined sewer
Total	**30.6**	**30.6 acres untreated**	**16 acres treated, 14.6 acres retrofit for detention**

[1] Low-flow diversions are structures constructed within the drainage system that divert a volume of runoff equivalent to the first flush to the combined sewer system and divert the remaining volume to an outfall for direct discharge.

Under normal operating conditions, the combined sewer system drains to a large County conveyance pipe under Second Avenue known as the Elliott Bay Interceptor (EBI). The EBI conveys flows to the West Point WWTP for treatment and discharge into Puget Sound.

During normal operations, all flows that are part of the combined sewer system are conveyed to the West Point WWTP, where they are treated and discharged to Puget Sound. However, portions of the combined sewer system have limited capacity. During wet weather conditions, when the capacity is exceeded, combined sewer overflows are directed to outfalls that discharge untreated stormwater to the Duwamish River or Elliott Bay. Hydraulic modeling has been conducted to estimate average frequencies and volumes of combined sewer overflows in the Seattle Central Business District[1] (Black and Veatch 2007).

3.2 Duwamish River

The Duwamish River is part of Water Resource Inventory Area (WRIA) 9. It originates at the confluence of the Green and Black Rivers, and flows approximately 13 miles to the northwest before discharging into Elliott Bay. The Duwamish River has a contributing basin of approximately 372,500 acres and is the primary source of fresh water to Elliott Bay. The Duwamish River is a Type S stream. Ecology defines Type S streams as streams that are shorelines of the state and typically have high fish, wildlife, or human use (WAC 222-16-031, RCW 90.58).

The lower 10 miles of the Duwamish River, including the portion adjacent to the project area, are tidally influenced and estuarine (Ecology 1994, 1995b). Much of the area is zoned for industrial and commercial use by the Seattle Municipal Code. The mouth of the Duwamish River is divided into two channels (the East and West Waterways) by Harbor Island. The East Waterway carries between 20 and 30 percent of the flow depending on the tidal conditions. The Duwamish River East Waterway[2] is located adjacent to the southern portion of the project area.

Ecology has designated the following uses for protection in the Duwamish River: salmon and trout rearing, secondary contact recreational uses, water

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[1] The model evaluated the King, Washington, Madison, University, and Vine outfalls, but did not include the Connecticut outfall.

[2] The Duwamish River is defined in Washington Administrative Code (WAC) as a line bearing 254 degrees true from the northwest corner of berth 3 of Pier 37. The approximate boundary is shown in Exhibit 3-1.

supply (industrial and agricultural), stock watering[3], wildlife habitat, sport fishing, boating, aesthetic enjoyment, and commerce and navigation (WAC 173-201A, Ecology 2005a).

The reach of the Duwamish River adjacent to the project area is listed on Ecology's 2004 303(d) list for exceeding sediment criteria (Section 3.5, Ecology 2005a). Exceedances of sediment criteria are generally associated with contamination from historic industrial activities and contaminated discharges from stormwater and combined sewer overflows. The United States Environmental Protection Agency (EPA) designated Harbor Island as a National Priority List (NPL) site in 1993 as part of the Superfund program (EPA 2008). The Harbor Island site includes the East Waterway of the Duwamish River in the vicinity of the Project. Since this designation, several sites have been identified for cleanup, and several cleanup and monitoring actions have been completed (EPA 2008). No total maximum daily loads (TMDLs) have been prepared for the Duwamish River.

Runoff from the project area drains to the Duwamish River from the Lander Sub-basin (see Exhibit 3-2).

3.2.1 Lander Sub-basin

The Lander Sub-basin covers approximately 1.4 acres and includes the existing viaduct between S. Walker Street and S. Holgate Street. The total contributing area to the Lander outfall is much larger than the Lander Sub-basin and includes areas east of I-5 (see Exhibit 3-3).

Historically, runoff from the Lander Sub-basin was collected in the combined sewer system. In the late 1980s the Lander/Bayview Separation project was completed. The objective of the project was to reduce overflows at this outfall. This was accomplished by (1) separating stormwater runoff from the Lander Sub-basin (and other areas) from the combined sewer system, (2) creating a new combined line, and (3) creating a parallel stormwater-only conveyance system (Ecology 1994).

Currently, stormwater runoff in the Lander Sub-basin is collected in a separated stormwater collection system and discharged to the Duwamish River. The larger Lander Basin is still served by a combined sewer system, and King County manages the Lander outfall as an overflow for the combined sewer system.

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[3] It is unknown if the Duwamish River is currently used for stock watering, but this use is protected under the Ecology designation.

3.3 Elliott Bay

Elliott Bay makes up the eastern portion of central Puget Sound. It is an estuary that is up to 590 feet deep (Ecology 1994). However, it is shallow in the nearshore, which is adjacent to the project area, and where the outfalls discharge.

The Duwamish River flows into the southern portion of Elliott Bay and is the primary source of fresh water to Elliott Bay. Residence time of fresh water in the Inner Harbor varies from 1 to 10 days depending on weather. Based on the results of numerous studies, estuarine water in Elliott Bay generally circulates counter-clockwise. Fresh water enters from the Duwamish River, moves north along the Inner Harbor, and then flows out to Puget Sound (Ecology 1995a; URS Engineers and Evans-Hamilton 1986). Water currents in the Inner Harbor are generally low, and velocities are typically oriented parallel to the faces of downtown waterfront piers (Sillcox et al. 1981).

Ecology has designated Elliott Bay as an excellent marine water body that should be protected for the following uses: salmonid and other fish migration, rearing, and spawning; shellfish rearing and spawning; shellfish harvesting; primary contact recreation; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values (WAC 173-201A, Ecology 2005a). Elliott Bay is listed on the 2002/2004 Ecology 303(d) List of Impaired and Threatened Water Bodies for exceeding fecal coliform criteria. No TMDLs for pollutants of concern have been prepared for Elliott Bay. In addition, Elliott Bay has also exceeded numerous sediment criteria, which are discussed in Section 3.5, Nearshore Sediments.

3.3.1 Royal Brougham Sub-basin

The Royal Brougham Sub-basin is located between S. Holgate Street and Railroad Way S. (see Exhibit 3-2). Stormwater runoff in this sub-basin is either collected in the combined sewer system or collected in a stormwater system, which flows to a low-flow diversion structure. The low-flow diversion structure diverts the first flush of stormwater (approximately 10 percent of the average annual volume) to the combined sewer system; it is then conveyed to the West Point WWTP or discharged as part of a combined sewer overflow. The remainder of stormwater is diverted to the 72-inch-diameter shared stormwater/combined sewer Connecticut outfall, where it is discharged directly to Elliott Bay with no treatment. Currently, 11.1 acres of the project area within the Royal Brougham Sub-basin is conveyed to the low-flow diversion structure. Stormwater collected from the remaining 12.1 acres of the project area located in the Royal Brougham Sub-basin is conveyed in pipes to the combined sewer system.

King County operates the Royal Brougham (also known as Kingdome) regulator as part of the EBI system and regulates combined sewer overflow events that occur at the Connecticut outfall. Exhibit 3-5 shows the frequency and volume of recorded combined sewer overflow events at the shared (stormwater plus combined sewer overflow) Connecticut outfall.

Exhibit 3-5. King County Combined Sewer Overflow Discharges to Elliott Bay in the Project Area

	Connecticut Outfall[1] (Royal Brougham Sub-basins)		King Outfall	
Study Period	Frequency (events/yr)	Volume (MG/yr)	Frequency (events/yr)	Volume (MG/yr)
1983 Baseline[2]	29	90	14	55
1999[2]	10	79	14	38
2006-2007	22	18.54	8	35.26

Source: King County 2002, 2007.
MG/yr = million gallons per year
[1] Outfall 029 associated with the Kingdome regulator.
[2] Based on historical combined sewer overflow events and modeling (King County 2000).

In addition to the Connecticut outfall, King County operates the King outfall, which receives runoff from the project area. Combined sewer overflows at this outfall are discussed later in the Puget Sound section (Section 3.4.1).

3.4 Puget Sound

Puget Sound is a large marine water body that covers approximately 900 square miles, including Elliott Bay. Other than Elliott Bay, Puget Sound has not been listed on Ecology's 303(d) list and is designated as a Class AA water body (extraordinary) within the project area. Characteristic uses of Class AA water bodies include fish and shellfish (migration, rearing, and harvesting), wildlife habitat, recreation (primary contact, sport fishing, boating, and aesthetic enjoyment), commerce, and navigation. No TMDLs have been prepared for Puget Sound in the vicinity of the project area.

Under normal operating conditions, which include small storms, stormwater runoff from the King Sub-basin is collected in combined sewer pipes and discharged to Puget Sound as treated combined stormwater at a deep water outfall from the West Point WWTP. During large storm events or multiple smaller storms in quick succession, when the combined sewer capacity is exceeded, untreated combined sewer overflow events occur at numerous locations within the system, including outfalls located along the Duwamish East Waterway and Elliott Bay waterfront.

3.4.1 King Sub-basin

The King Sub-basin is approximately 6.0 acres in area and includes the existing Alaskan Way Viaduct between Railroad Way S. and S. King Street. The King Sub-basin is part of a larger basin that extends east of I-5 (see Exhibit 3-3). Stormwater runoff in this sub-basin is collected in separated storm pipes; however, they connect to the combined sewer system upstream of a diversion structure. Therefore, under normal operating conditions, stormwater runoff from this basin is diverted to the EBI. It is then conveyed to the West Point WWTP, where it is treated and discharged to Puget Sound. During large storm events, stormwater runoff is discharged directly to Elliott Bay as part of an untreated combined sewer overflow (see Exhibit 3-5).

3.5 Nearshore Sediments

Sediments in the Duwamish River/Elliott Bay waterfront area contain various pollutants (primarily metals and organic compounds) at levels that exceed state sediment management standards. Existing information on known contaminants in nearshore sediments in these areas is described below.

3.5.1 Duwamish River

The Lander shared storm drain/combined sewer outfall discharges to the East Waterway of the Duwamish River (see Exhibit 3-2). Sediment samples collected and analyzed from this area have exceeded the sediment quality standards for several metals and organic compounds. These metals and compounds include polycyclic aromatic hydrocarbons (PAHs), phthalates, polychlorinated biphenyls (PCBs), cadmium, mercury, zinc, and other organic compounds. The complete list of pollutants is provided in Attachment B. Because of these exceedances, this portion of the Duwamish River was listed on the Washington State 2004 303(d) list (Ecology 2005a).

Ecology's SEDQUAL Database (Release 5, February 2004) includes records for a number of sediment samples collected from the East Waterway in the vicinity of the Lander combined sewer outfall and storm drain. These samples were screened for pollutants that exceed the Washington State Sediment Management Standards Cleanup Screening Levels (CSLs). Pollutants with sediment concentrations that exceeded CSLs are acenaphthene, fluorene, various organic compounds, total PCBs, cadmium, zinc, and mercury (Attachment B).

In addition, the lower reaches of the Duwamish River (upstream of the project area) are on the EPA NPL for containing contaminated sediment (EPA 2001). The EPA documented contaminated sediments in a 5-mile stretch of the Lower Duwamish Waterway, from the southern tip of Harbor Island to just downstream of river mile 5.0 near King County's Norfolk combined sewer outfall (EPA 2003).

3.5.2 Elliott Bay

Sediment Information from Data Review

Nearshore sediments in Elliott Bay contain elevated levels of various metals and chemical compounds considered pollutants (see Appendix B) (Romberg et al. 1984; EPA 1988; Metro 1988b, 1989, 1993; Tetra Tech, Inc. 1988; Hart Crowser 1994; KCDMS 1994; Norton and Michelson 1995; Ecology 1995a). These sediments have been listed on the Ecology 303(d) list for exceeding state standards for numerous pollutants of concern. Exceedances of sediment criteria are generally associated with previous industrial activities and stormwater and combined sewer overflows.

Nearshore Elliott Bay sediments within the project area are typically composed of 30 to 70 percent fine sediments (clays, silts, and very fine sands) with the remainder composed of sands and gravels. This composition changes in locations where the sediments have been disturbed by boat traffic, remedial cap placement, or dredging activity. Within the study area, surface and subsurface sediments near King County's King outfall were analyzed and found to contain mercury, silver, lead, and zinc.

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Chapter 4 OPERATIONAL EFFECTS, MITIGATION, AND BENEFITS

It is well documented that runoff from streets and highways, particularly in urban environments, contains pollutants that can affect the water quality of the receiving water. Studies conducted on highway runoff in the Seattle area indicate that highways are a measurable source of suspended solids and metals (zinc and copper), as well as other pollutants (Driscoll et al. 1990).

Pollutant loads contained in stormwater runoff vary depending on the amount and type of PGIS, traffic volumes and average speed, duration and intensity of a storm event, time of year, antecedent weather conditions, and several other factors.

The Build Alternative would manage stormwater generated from the Project in one of two ways: (1) by treating it prior to discharge using water quality BMPs for basic treatment, as defined in the 2006 WSDOT Highway Runoff Manual, or (2) by detaining it with detention BMPs, as defined and required in the 2000 Seattle Stormwater Grading and Drainage Code. Although the final water quality BMPs have not been designed, the types of water quality BMPs being considered for these areas include wet vaults or other BMPs that meet basic treatment standards. The pollutant loading to receiving waters in the project area would be substantially reduced relative to the existing conditions (No Build), as shown in Exhibit 4-1.

The reduced pollutant load would improve water quality relative to existing conditions. It would also benefit nearshore habitat by reducing annual pollutant loads that collect in the sediments.

4.1 No Build Alternative

Under the No Build Alternative, the existing Alaskan Way Viaduct within the project area would not be retrofitted with stormwater treatment. Water quality would not improve, because stormwater would continue to be discharged under the same conditions as it currently is.

4.2 Build Alternative

The Build Alternative would retrofit existing surfaces with BMPs that would treat or detain stormwater. The Build Alternative would result in a net benefit to the environment, improving both water quality and nearshore sediments, as compared to existing conditions.

Exhibit 4-1. Summary of Annual Pollutant Loading (pounds/year)[1, 2]

Receiving Water	Pollutant	No Build	Build	Net Change	Percent Reduction
Duwamish River/Elliott Bay					
	TSS	7,733	1,742	-5,991	77%
	Total Copper	2.74	1.35	-1.39	51%
	Dissolved Copper	0.73	0.62	-0.11	15%
	Total Zinc	15.05	6.25	-8.80	58%
	Dissolved Zinc	5.47	3.73	-1.74	32%
Puget Sound[3]					
	TSS	570	466	-104	18%
	Total Copper	1.63	1.33	-0.30	18%
	Dissolved Copper	0.89	0.73	-0.16	18%
	Total Zinc	6.57	5.36	-1.21	18%
	Dissolved Zinc	6.73	5.49	-1.24	18%

[1] Total suspended solids (TSS) are rounded to the nearest pound; copper and zinc are rounded to the nearest hundredth of a pound.
[2] Annual pollutant load from project area after treatment with stormwater BMPs.
[3] Discharged at the West Point WWTP outfall.

4.2.1 Duwamish River

The Build Alternative would construct BMPs to treat runoff from the project area in the Lander Sub-basin. The final water quality BMPs have not been determined; however, the types of water quality BMPs being considered for these areas include wet vaults or StormFilters with ZPG™ media. Other BMPs that achieve basic treatment include bioinfiltration swales, sand filters, filter strips, wetponds, bioretention/rain gardens, and other types of facilities. The Build Alternative would improve the quality of water discharged as compared to existing conditions (see Exhibit 4-1).

4.2.2 Elliott Bay

Stormwater

The Build Alternative would construct BMPs to treat runoff from the project area in the portions of the Royal Brougham Sub-basin that discharge to Elliott Bay via the diversion structure. The final water quality BMPs have not been determined; however, the types of water quality BMPs being considered for these areas include wet vaults or other BMPs that achieve basic treatment (see Section 4.2.1). The Build Alternative would also reduce the volume of water directed to the combined sewer system in the Royal Brougham Sub-basin, which may reduce the volume and/or frequency of combined sewer overflow events. As a result, the Build Alternative would improve the quality of water discharged as compared to existing conditions (see Exhibit 4-1).

Groundwater

There are no operational effects to groundwater from the Build Alternative. The project area is already covered by impervious surfaces.

4.2.3 Puget Sound

The Build Alternative would reduce the volume of stormwater conveyed to the combined sewer system. This would reduce the annual volume of water and associated pollutants conveyed to the West Point WWTP, and therefore reduce the amount of pollutants discharged to Puget Sound from the West Point WWTP outfall.

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Chapter 5 CONSTRUCTION EFFECTS AND MITIGATION

Construction-related effects would be temporary and could occur at any time throughout the approximately 4 years 4 months of anticipated construction. Construction-related effects would be minimized or prevented through proper selection, maintenance, and management of the BMPs, and implementation of the temporary sediment and erosion control plan that would be developed for the Project. Construction effects are grouped into three general categories based on the type of effects: (1) earthwork and staging, (2) soil improvement, and (3) dewatering. Construction-related effects to receiving waters associated with the Build Alternative are discussed in the following sections. Additional construction effects associated with spoils removal and hazardous materials are discussed in the Hazardous Materials Technical Memorandum.

5.1 Earthwork and Staging

The Build Alternative would require some grading and excavation. Construction-related water quality effects include those caused by erosion of disturbed soil areas or soil stockpiles resulting in silt and sediment transport to receiving water by stormwater runoff. These effects would be most likely to occur during the approximately 3 years 2 months of major construction activities (Traffic Stages 1 through 4), although they could occur at anytime during the construction period. Stormwater runoff from construction staging areas may also carry other contaminants (see the Hazardous Materials Technical Memorandum for discussion of construction effects and mitigation relating to contaminants). Sediment and other contaminants can increase turbidity and affect other water quality parameters, such as the amount of available oxygen in the water. In addition, pH can be altered if runoff is in contact with concrete and grout during the curing process.

Construction BMPs would be implemented to prevent and minimize water quality effects from erosion of disturbed areas, accidental spills from construction equipment, or other construction-related activities. Typical BMPs used during construction include implementation of a temporary erosion and sediment control plan and spill prevention plan, silt fencing, covering soil stockpiles, stormdrain protection, construction vehicle wheel-washing facilities, and others. These are examples of BMPs that may be used during construction of this Project.

5.2 Soil Improvement

Soil improvements would likely consist of a combination of stone columns (vibro-replacement), jet grouting, and deep soil mixing, which are intended to improve soil stability. Jet grouting produces a waste slurry that has high pH, which could affect the quality of stormwater leaving the site and the receiving water if not properly managed. Any dewatered slurry would be treated as needed prior to discharge to the stormwater system or receiving water or disposed of in an approved off-site facility.

5.3 Dewatering

The Build Alternative would likely require temporary construction dewatering in some locations. Recent samples collected for the Electric Line Relocation Project, which is located in the same vicinity and assumed to be relevant for this Project, indicate that dewatering water may contain metals, volatile organic compounds, and oil-range petroleum hydrocarbons (Shannon & Wilson, Inc. 2007). However, these levels do not exceed the King County Wastewater Treatment Division Discharge Limits (Parametrix 2007). Dewatering water meeting King County discharge limits would be discharged to the combined sewer system or reinjected into the groundwater. Because there would be no surface water discharge of temporary construction dewatering, and treatment would be provided as needed prior to discharge to the combined sewer system or reinjection into the groundwater, no water quality effects are expected from construction dewatering in the project area from the Build Alternative.

Chapter 6 INDIRECT AND CUMULATIVE EFFECTS

Indirect effects are effects that are caused by the Project but occur later in time or are outside the geographic area of the Project. Cumulative effects are effects that could result when relatively minor independent effects from multiple projects become collectively substantial over time if not properly mitigated.

The Project is a transportation replacement project that would not increase traffic capacity and is not expected to substantially increase the number of trips to the project area. Indirect effects associated with increased traffic volumes are not expected. Additionally, since the Project is already in a highly developed corridor, cumulative effects resulting from the incremental effect of the Project when added to past, present, or reasonably foreseeable future projects would be minor.

The SR 519 Intermodal Access Project Phase 2 is currently planned to begin in the fall of 2008. The SR 519 project is in the vicinity of this Project, and cumulative benefits to water quality could be seen if both projects provide treatment and/or detention of stormwater from the replaced impervious surfaces. The proposed construction period for the SR 519 project would partially overlap with the proposed construction period of this Project. However, temporary construction-related effects would be independent and not likely to result in cumulative temporary effects to water quality.

As presented in Chapter 3, Affected Environment, the water quality adjacent to the project area has been affected by development over the last 100 years. This Project would provide a benefit to water quality by providing water quality treatment for stormwater runoff from portions of the replaced PGIS.

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ATTACHMENT A

Pollutant Loading Results

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Attachment A
Draft Pollutant Loading Calculations

Existing Conditions

Pollutant	Pollutant Load (lbs/yr)							
	Elliott Bay					Puget Sound WWTP Outfall		
	Lander Outfall	Connecticut Outfall	King Outfall	Total		RB Basin	King Basin	Total
TSS	763	6,061	909	7,733		420	150	570
Total Cu	0.27	2.15	0.32	2.74		1.20	0.43	1.63
Dissolved Cu	0.07	0.57	0.09	0.73		0.66	0.23	0.89
Total Zn	1.49	11.80	1.77	15.06		4.84	1.73	6.57
Dissolved Zn	0.54	4.29	0.64	5.47		4.96	1.77	6.73

Proposed Conditions

Pollutant	Pollutant Load (lbs/yr)							
	Elliott Bay					Puget Sound WWTP Outfall		
	Lander Outfall	Connecticut Outfall	King Outfall	Total		RB Basin	King Basin	Total
TSS	61	772	909	1,742		316	150	466
Total Cu	0.09	0.94	0.32	1.35		0.90	0.43	1.33
Dissolved Cu	0.05	0.49	0.09	0.63		0.49	0.23	0.72
Total Zn	0.38	4.10	1.77	6.25		3.64	1.73	5.37
Dissolved Zn	0.27	2.82	0.64	3.73		3.73	1.77	5.50

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ATTACHMENT B

Summary of Sediment Survey Findings

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SUMMARY OF SEDIMENT SURVEY FINDINGS

B.1 SEDIMENTS

Sediment quality in the vicinity of the Alaskan Way Viaduct and Seawall Replacement Program (the Program) was evaluated by (1) reviewing the Washington State Department of Ecology's (Ecology) SEDQUAL database, (2) reviewing Ecology's 303(d) contaminated sediment listings, (3) reviewing previous studies along Elliott Bay and the Duwamish River, and (4) collecting additional sediment samples in areas of Elliott Bay to fill in identified data gaps.

The newest release of the SEDQUAL database (Release 5.0, October 2004) was reviewed for data that exceed the Washington State Sediment Management Standard (SMS) Cleanup Screening Levels (CSL) (Ecology 1995a). Station locations within the project area were selected visually using the GIS mapping function, and corresponding sediment chemistry data were exported from the SEDQUAL database. The CSL were compared to the data using the SEDQUAL comparison function for all locations. All data that exceeded the SMS criteria for the project area were selected and sorted to remove all pre-1990 data[1] as well as laboratory and field duplicate data. The maximum value for each analyte at a station was used for stations that had multiple sample entries (due to multiple depths, unidentified duplicates, etc.). The station coordinates (in NAD83) were obtained from the SEDQUAL database.

The Ecology 2004 303(d) lists for contaminated sediments were also reviewed to determine if any areas adjacent to the Program are listed for contaminated sediments. The interactive mapping function on Ecology's website (Ecology 2007) was used to identify grid cells in the project area. The cells were cross-referenced with the 303(d) lists.

A number of previous studies along Elliott Bay and the Duwamish River were reviewed, including a technical memorandum (Shaw Environmental, Inc. 2004) that summarized a review of existing offshore sediment data and identified data gaps.

Parametrix collected sediment samples in Elliott Bay during November 2006 for the purpose of supplementing existing information and supporting impact analysis for the Program's Final Environmental Impact Statement. Sediment sampling methods and chemical analytical results are presented in the Draft Parametrix Sediment Characterization Report (Parametrix 2007).

[1] Pre-1990 data were removed because detection limits were higher then (so there were more no detects), analytical methods may or may not have been comparable to today's standards, and there is a general issue of comparability and reliability with older data.

B.1.1 Duwamish River East Waterway

The Lander shared storm drain/combined sewer outfall and the Hanford combined sewer outfall discharge to the East Waterway of the Duwamish River. Several sediment samples in the vicinity of these outfalls were listed in the SEDQUAL database as exceeding SMS CSL criteria for metals (including mercury, cadmium, and zinc), total polychlorinated biphenyls (PCBs), and various polycyclic aromatic hydrocarbons (PAHs). The sample locations and corresponding tables of CSL exceedances are shown in Exhibits B-1 and B-2 (near Lander outfall) and Exhibits B-3 and B-4 (near Hanford outfall).

Sediment samples in this segment of the river have exceeded the sediment quality standards (SQS) for the following parameters and are the basis for inclusion on the Washington State 2004 303(d) Category 2 and 5 Contaminated Sediment lists.

- 1,2,4-Trichlorobenzene
- 1,4-Dichlorobenzene
- N-nitrosodiphenylamine
- Acenaphthene, LPAH
- 1,2-Dichlorobenzene
- 2-Methylphenol
- Phenanthrene, LPAH
- Benz(a)anthracene, HPAH
- Pentachlorophenol
- Benzo(g,h,i)perylene, HPAH
- Dibenz(a,h)anthracene, HPAH
- Chrysene, HPAH
- Fluoranthene, HPAH
- Indeno(1,2,3-cd)pyrene, HPAH
- Hexachlorobenzene
- Phenol
- Bis(2-ethylhexyl)phthalate
- Hexachlorobutadiene
- Dibenzofuran
- Total PCBs
- Cadmium
- 2,4-Dimethylphenol
- Fluorene
- Diethylphthalate
- Dimethylphthalate
- 4-Methylphenol
- Di-n-octyl phthalate
- Di-n-butyl phthalate

LPAH = light polycyclic aromatic hydrocarbon, HPAH = heavy polycyclic aromatic hydrocarbon

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● CSO and City of Seattle Stormdrain Outfall

● Sediment Sampling Sites

Exhibit B-1.
Lander street CSO and storm drain outfall and sediment sample locations taken from SEDQUAL database (Ecology, Release 5, Oct. 2004)

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100 0 100 Feet

Exhibit B-2. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of the Lander Outfall and Storm Drain

SEDQUAL								Criteria			
Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
Misc. Organic Compounds											
PST18_P1	64	S58/3	Mar-96	Bis(2-ethylhexyl)phthalate	52	PPM		SQS	47	PPM	TOC
PCBs											
HIRIPH2	E-15	E-15	Oct-91	Total PCBs	26	PPM	E	SQS	12	PPM	TOC
PST18_P1	26	S22/3	Mar-96	Total PCBs	19	PPM		SQS	12	PPM	TOC
Metals											
HIRIPH2	E-15	E-15	Oct-91	Cadmium	7	PPM		CSL	6.7	PPM	DRY
HIRIPH2	E-15	E-15	Oct-91	Cadmium	7	PPM		SQS	5.1	PPM	DRY
HIRIPH2	E-15	E-15	Oct-91	Cadmium	8.3	PPM		CSL	6.7	PPM	DRY
HIRIPH2	E-15	E-15	Oct-91	Cadmium	8.3	PPM		SQS	5.1	PPM	DRY
PST18_P1	63	S57/3	Mar-96	Cadmium	6	PPM		SQS	5.1	PPM	DRY
PST18_P1	21	S17/9	Mar-96	Mercury	0.56	PPM		SQS	0.41	PPM	DRY
PST18_P1	22	S18/1	Mar-96	Mercury	0.48	PPM		SQS	0.41	PPM	DRY
PST18_P1	24	S20/9	Mar-96	Mercury	0.79	PPM	M	CSL	0.59	PPM	DRY
PST18_P1	24	C3/12	Mar-96	Mercury	0.48	PPM		SQS	0.41	PPM	DRY
PST18_P1	24	S20/9	Mar-96	Mercury	0.79	PPM	M	SQS	0.41	PPM	DRY
PST18_P1	25	S21/8	Mar-96	Mercury	0.89	PPM		CSL	0.59	PPM	DRY
PST18_P1	25	S21/8	Mar-96	Mercury	0.89	PPM		SQS	0.41	PPM	DRY
PST18_P1	27	S23/3	Mar-96	Mercury	0.85	PPM	M	CSL	0.59	PPM	DRY
PST18_P1	27	S23/3	Mar-96	Mercury	0.85	PPM	M	SQS	0.41	PPM	DRY
PST18_P1	31	S27/9	Mar-96	Mercury	0.9	PPM		CSL	0.59	PPM	DRY
PST18_P1	31	S27/9	Mar-96	Mercury	0.9	PPM		SQS	0.41	PPM	DRY
PST18_P1	32	C4/12	Mar-96	Mercury	0.6	PPM		CSL	0.59	PPM	DRY
PST18_P1	32	C4/12	Mar-96	Mercury	0.6	PPM		SQS	0.41	PPM	DRY
PST18_P1	32	S28/12	Mar-96	Mercury	1.2	PPM		CSL	0.59	PPM	DRY
PST18_P1	32	S28/12	Mar-96	Mercury	1.2	PPM		SQS	0.41	PPM	DRY
PST18_P1	33	S29/9	Mar-96	Mercury	0.88	PPM		CSL	0.59	PPM	DRY
PST18_P1	33	S29/9	Mar-96	Mercury	0.88	PPM		SQS	0.41	PPM	DRY
PST18_P1	62	S56/7	Mar-96	Mercury	0.59	PPM		SQS	0.41	PPM	DRY
PST18_P1	63	S57/3	Mar-96	Mercury	0.81	PPM		CSL	0.59	PPM	DRY
PST18_P1	63	S57/3	Mar-96	Mercury	0.81	PPM		SQS	0.41	PPM	DRY
PST18_P1	64	S58/3	Mar-96	Mercury	0.44	PPM		SQS	0.41	PPM	DRY
PST18_P1	65	S59/2	Mar-96	Mercury	0.56	PPM		SQS	0.41	PPM	DRY
PST18_P1	32	S28/9	Mar-96	Zinc	420	PPM		SQS	410	PPM	DRY
PST18_P1	33	S29/8	Mar-96	Zinc	450	PPM		SQS	410	PPM	DRY

Source: SEDQUAL Release 5 (2004) SMS Exceedances - Lander CSO Area (3/6/2007)

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CSO and City of Seattle Stormdrain Outfall

Sediment Sampling Sites

Exhibit B-3.
Hanford CSO outfall and sediment sample locations taken from SEDQUAL (Ecology, Release 5, Oct. 2004)

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100 0 100 Feet

Exhibit B-4. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of the Hanford Outfall

SEDQUAL								Criteria			
Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
LPAH Compounds											
HANCSO95	HN10W	L6393-6	Jun-95	Acenaphthene	21	PPM		SQS	16	PPM	TOC
HANCSO95	HN10W	L6393-6	Jun-95	Fluorene	26	PPM	E	SQS	23	PPM	TOC
Misc. Organic Compounds											
HANCSO95	HN00	L6393-1	Jun-95	1,4-Dichlorobenzene	3.8	PPM	G	SQS	3.1	PPM	TOC
HANCSO95	HN10W	L6393-6	Jun-95	1,4-Dichlorobenzene	4.7	PPM	G	SQS	3.1	PPM	TOC
HIRIPH2	E-02	E-02	Oct-91	1,4-Dichlorobenzene	3.8	PPM	E	SQS	3.1	PPM	TOC
HIRIPH2	E-06	E-06	Oct-91	1,4-Dichlorobenzene	5.9	PPM	E	SQS	3.1	PPM	TOC
HANCSO95	HN10S	L6393-4	Jun-95	Benzoic acid	720	PPB		CSL	650	PPB	DRY
HANCSO95	HN10S	L6393-4	Jun-95	Benzoic acid	720	PPB		SQS	650	PPB	DRY
HIRIPH2	E-06	E-06	Oct-91	Bis(2-ethylhexyl)phthalate	71	PPM	E	SQS	47	PPM	TOC
HANCSO95	HN10S	L6393-4	Jun-95	Phenol	3300	PPB		CSL	1200	PPB	DRY
HANCSO95	HN10W	L6393-6	Jun-95	Phenol	1500	PPB		CSL	1200	PPB	DRY
HANCSO95	HN20S	L6393-5	Jun-95	Phenol	1900	PPB		CSL	1200	PPB	DRY
HANCSO95	HN10S	L6393-4	Jun-95	Phenol	3300	PPB		SQS	420	PPB	DRY
HANCSO95	HN10W	L6393-6	Jun-95	Phenol	1500	PPB		SQS	420	PPB	DRY
HANCSO95	HN20S	L6393-5	Jun-95	Phenol	1900	PPB		SQS	420	PPB	DRY
PCBs											
HANCSO95	HN00	L6393-1	Jun-95	Total PCBs	93	PPM		CSL	65	PPM	TOC
HANCSO95	HN00	L6393-1	Jun-95	Total PCBs	93	PPM		SQS	12	PPM	TOC
HANCSO95	HN10N	L6393-2	Jun-95	Total PCBs	45	PPM		SQS	12	PPM	TOC
HANCSO95	HN20N	L6393-3	Jun-95	Total PCBs	52	PPM		SQS	12	PPM	TOC
HANCSO95	HN10W	L6393-6	Jun-95	Total PCBs	130	PPM		CSL	65	PPM	TOC
HANCSO95	HN10S	L6393-4	Jun-95	Total PCBs	40	PPM		SQS	12	PPM	TOC
HANCSO95	HN10W	L6393-6	Jun-95	Total PCBs	130	PPM		SQS	12	PPM	TOC
HANCSO95	HN20S	L6393-5	Jun-95	Total PCBs	42	PPM		SQS	12	PPM	TOC
HIRIPH2	E-02	E-02	Oct-91	Total PCBs	34	PPM		SQS	12	PPM	TOC
HIRIPH2	E-06	E-06	Oct-91	Total PCBs	37	PPM		SQS	12	PPM	TOC
Metals											
HIRIPH2	E-02	E-02	Oct-91	Cadmium	7.4	PPM		CSL	6.7	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Cadmium	7.4	PPM		CSL	6.7	PPM	DRY
HIRIPH2	E-02	E-02	Oct-91	Cadmium	7.4	PPM		SQS	5.1	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Cadmium	7.4	PPM		SQS	5.1	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Cadmium	8.3	PPM		CSL	6.7	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Cadmium	8.3	PPM		SQS	5.1	PPM	DRY
HANCSO95	HN00	L6393-1	Jun-95	Mercury	0.53	PPM		SQS	0.41	PPM	DRY
HANCSO95	HN10N	L6393-2	Jun-95	Mercury	0.55	PPM		SQS	0.41	PPM	DRY
HANCSO95	HN20N	L6393-3	Jun-95	Mercury	0.59	PPM		SQS	0.41	PPM	DRY
HANCSO95	HN10S	L6393-4	Jun-95	Mercury	0.61	PPM		CSL	0.59	PPM	DRY
HANCSO95	HN10W	L6393-6	Jun-95	Mercury	0.78	PPM		CSL	0.59	PPM	DRY
HANCSO95	HN10S	L6393-4	Jun-95	Mercury	0.61	PPM		SQS	0.41	PPM	DRY
HANCSO95	HN10W	L6393-6	Jun-95	Mercury	0.78	PPM		SQS	0.41	PPM	DRY
HANCSO95	HN20S	L6393-5	Jun-95	Mercury	0.48	PPM		SQS	0.41	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Mercury	1.5	PPM	E	CSL	0.59	PPM	DRY
HIRIPH2	E-02	E-02	Oct-91	Mercury	0.49	PPM	E	SQS	0.41	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Mercury	1.5	PPM	E	SQS	0.41	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Mercury	4.2	PPM	E	CSL	0.59	PPM	DRY
HIRIPH2	E-06	E-06	Oct-91	Mercury	4.2	PPM	E	SQS	0.41	PPM	DRY
PST18_P1	49	S45/1	Mar-96	Mercury	0.82	PPM		CSL	0.59	PPM	DRY
PST18_P1	49	S45/1	Mar-96	Mercury	0.82	PPM		SQS	0.41	PPM	DRY
PST18_P1	72	S66/2	Mar-96	Mercury	0.67	PPM		CSL	0.59	PPM	DRY
PST18_P1	72	S66/2	Mar-96	Mercury	0.67	PPM		SQS	0.41	PPM	DRY
PST18_P1	51	S47/10	Mar-96	Mercury	1.6	PPM		CSL	0.59	PPM	DRY
PST18_P1	51	S47/10	Mar-96	Mercury	1.6	PPM		SQS	0.41	PPM	DRY

Souce: SEDQUAL Release 5 (2004) SMS Exceedances - Hanford CSO Area (3/6/2007)

B.1.2 Elliott Bay

Both surface and subsurface sediments in Elliott Bay have been analyzed for contaminants of concern in previous studies and in November 2006 when Parametrix collected 13 additional samples in areas where there were data gaps. The results of these studies are summarized below. The sample locations are shown on Exhibit B-5.

Surface Sediments

The Seattle waterfront from Pier 46 to Pier 59 has been the focus of several studies and remediation projects sponsored by the Elliott Bay Action Team, the U.S. Environmental Protection Agency (EPA), Ecology, the Municipality of Metropolitan Seattle, the City of Seattle, and the Elliott Bay/Duwamish Restoration Program. These projects have identified mercury, silver, lead, zinc, heavy polycyclic aromatic hydrocarbons (HPAHs), light polycyclic aromatic hydrocarbon (LPAHs), benzyl alcohol, butyl benzyl phthalate, phenol, and benzoic acid as contaminants of concern (Romberg et al. 1984; EPA 1988; Metro 1988; Tetra Tech, Inc. 1988; Metro 1989; Metro 1993; Hart Crowser 1994; KCDMS 1994). The Elliott Bay Waterfront Recontamination Study sponsored by the Elliott Bay/ Duwamish Restoration Program Panel used data from the above sources to describe surficial sediment chemistry for the waterfront study area. Surface sediment sampling locations (top 2 cm and top 10 cm samples) and data sources used for describing the surficial sediment chemistry are shown in Exhibit B-6 (Ecology 1995b).

Exhibits B-7 through B-12 show contours for selected metals (mercury, silver, lead, and zinc) and organic contaminants (LPAHs and HPAHs) analyzed during previous sediment sampling efforts (Ecology 1995b), as well as the most recent sediment sampling conducted by Parametrix in November 2006 (Parametrix 2007). Many of these constituents exceed the SQS and CSL within the study area. The contour maps show CSL exceedances for silver, zinc, and lead in the slips between Piers 46 and 48, and for lead and silver between Piers 48 and 52. Mercury exceeds the CSL throughout the study area except for the capped areas, seaward of Pier 48, and a relatively small area south of the Pier 53-55 cap. HPAHs were above the CSL off of Pier 53 and offshore of the aquarium. LPAHs exceeded the CSL between the Seattle Ferry Terminal and the Pier 53-55 cap. Sediment data from the SEDQUAL database that exceeded CSL criteria in the vicinity of Elliott Bay are also shown in Exhibit B-13. Exhibit B-14 shows sediment concentrations in samples collected from the project area in November 2006.

Exhibit B-15 shows the location of the Denny Way sediment remediation areas.

Elliott Bay is listed on the 2004 303(d) Category 2 and 5 lists for the following chemicals, which have exceeded the SQS.

- 2-Methylphenol
- Acenapthene
- Mercury
- Silver
- Phenol
- Sediment Bioassay
- Benz(a)anthracene
- Fluoranthene
- Indeno(1,2,3-cd)pyrene
- Benzo(g,h,i)perylene
- Phenanthrene
- Butylbenzyl phthalate
- Chrysene
- 2-Methylnaphthalene
- Fluorene
- 2,4-Dimethylphenol
- 1,2-Dichlorobenzene
- Benzo(a)pyrene
- Hexachlorobutadiene
- Hexachlorobenzene
- Dibenz(a,h)anthracene
- Dibenzofuran
- 1,4-Dichlorobenzene
- Pentachlorophenol
- Benzoic acid
- Benzyl alcohol
- 1,2,4-Trichlorobenzene
- Naphthalene
- HPAH and LPAH

Parametrix (2007) reported data for 13 samples collected along Elliott Bay in areas where there were data gaps (see Exhibit B-5). The results of the sampling were consistent with existing data. Mercury, PCBs, and PAHs are persistent contaminants that exceed the sediment quality criteria.

Subsurface Sediments

Five hollow stem auger cores from a Hart Crowser study were analyzed for PAHs and metals (Hart Crowser 1994). The core locations are shown on Exhibit B-16 (Ecology 1995b). These cores had up to 6 meters penetration. Analyses showed HPAHs, LPAHs, and mercury exceeding the CSL down to approximately 3 meters (10 feet). Exhibit B-16 shows example locations for deep cores to help fill existing data gaps (designated Areas A, B, and C on the figure) (Ecology 1995b).

To supplement existing subsurface sediment data on the area, the Elliott Bay Waterfront Recontamination Study (Ecology 1995b) collected three 4-inch gravity cores for selected chemical analysis: core C1, between Piers 54 and 56 (approximately 200 feet west of the shoreline); core C2, between Piers 56 and 57 (approximately 300 feet west of the shoreline); and core C3, approximately 100 feet north of Pier 48 (and 600 feet west of the shoreline). These sample locations are shown on Exhibit B-17. Sediment recoveries ranged in length from 84 to 155 cm (compacted).

The cores were analyzed for selected metals (aluminum, copper, iron, lead, magnesium, mercury, and zinc), PCBs, grain size, total organic carbon (TOC), percent solids, and $^{137}Cs/^{210}Pb$. In summary, concentrations of copper, lead, mercury, and zinc between Piers 56 and 57 (core C2) and lead and mercury between Piers 54 and 55 (core C1) and north of Pier 48 (core C3) exceeded the applicable CSL. Relatively high concentrations of mercury were present in all cores, ranging from 2.2 to 5.5 mg/kg in C1, 5.3 to 16 mg/kg in C2, and 0.036 to 1.8 mg/kg in C3 (all values dry weight) (mercury CSL = 0.58 mg/kg). The lead concentration in the upper 7 cm of the core north of Pier 48 (core C3) was extremely high at 2,100 mg/kg (CSL = 530 mg/kg). The highest total PCB level (8,800 μg/kg = 130 mg PCB/kg organic carbon) was measured in between Piers 56 and 57 (core C2) in the 21- to 42-cm layer (CSL = 65 mg PCB/kg organic material).

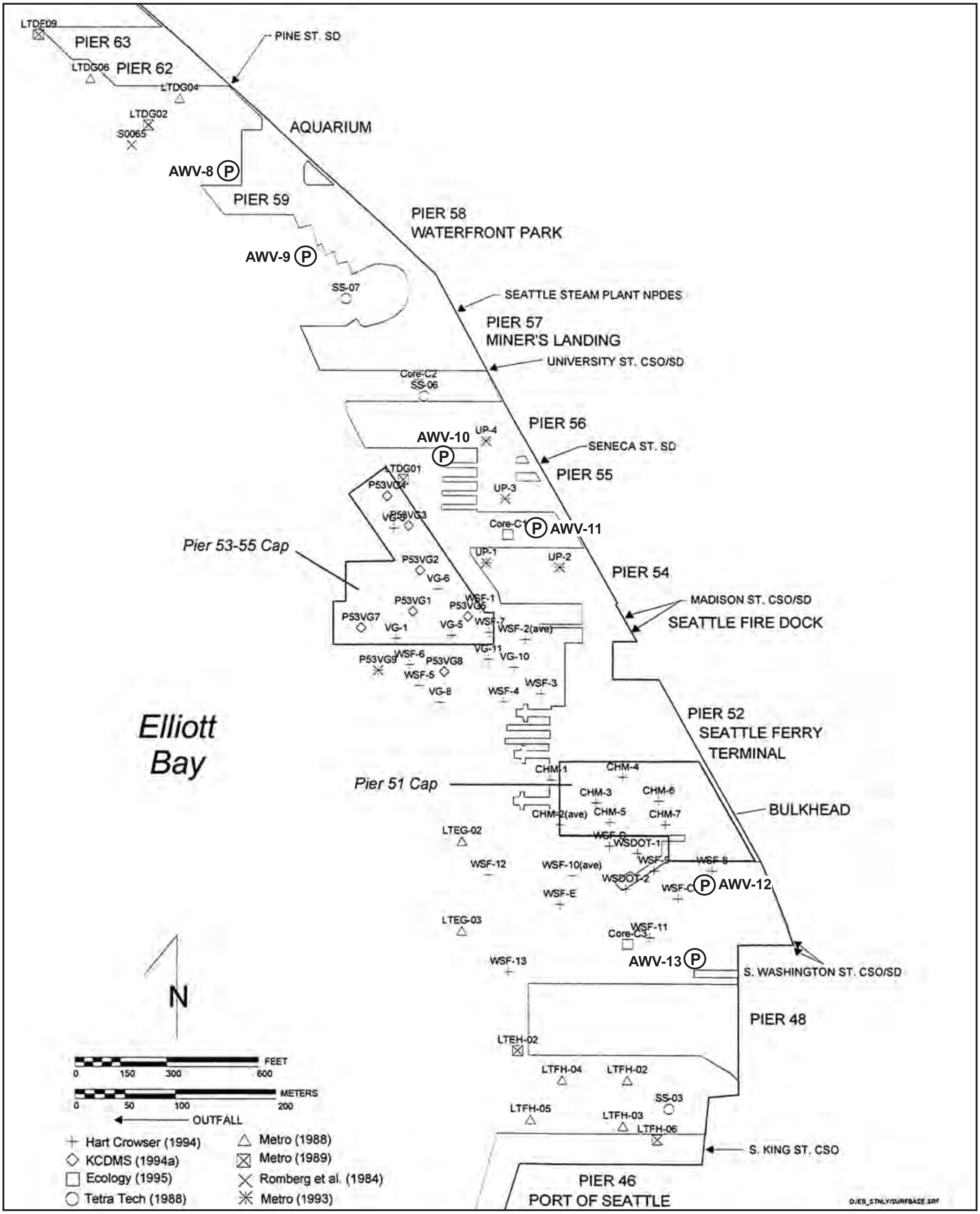
Vertical profiles in bottom cores indicate that between Piers 52 and 57 (northern portion of the study area), concentrations of most contaminants typically peak at depths ranging from 16 to 42 cm, with some contaminants peaking at deeper depths. This was especially true for mercury between Piers 56 and 57, where concentrations as high as 16 mg/kg (dry weight) occurred at a depth of 105 to 168 cm. In contrast, between Piers 48 and 52 (southern portion of the study area), the highest concentrations were typically present in the top 7 cm. The contaminant profile for this area is consistent with the ^{137}Cs results that suggested the upper portion of the sediment record may have been removed.

These data indicate that sediment cleanup(s) in the northern portion of the study area that only involved sediment removal (i.e., dredging) would potentially expose more highly contaminated material than currently exists at the surface.

A review of data entered in Ecology's SEDQUAL Database (Release 5.0, October 2004) revealed that recent characterization of Elliott Bay nearshore sediments has been limited (the most recently reported study was conducted in 1998) and that very little data exists for several waterfront sites along the project area. This was further confirmed by a data review conducted by Shaw Environmental, Inc. (2004) on behalf of WSDOT. Shaw Environmental was contracted to review existing offshore sediment data around Pier 48 to determine if sufficient data existed to conduct an adequate sediment baseline characterization for anticipated work at that site. Based on the results of their review, Shaw Environmental concluded that the existing data was insufficient and recommended that additional sampling be conducted to adequately characterize existing pollutant levels in that area (Shaw Environmental, Inc. 2004).

Date: 2-13-2007 File: K:\gis\1585 - Parsons Brinckerhoff\554-1585-025 Alaskan Way Viaduct and Seawall\JennaFriebel\support\mapdocs\AWV_SedimentSampling.mxd

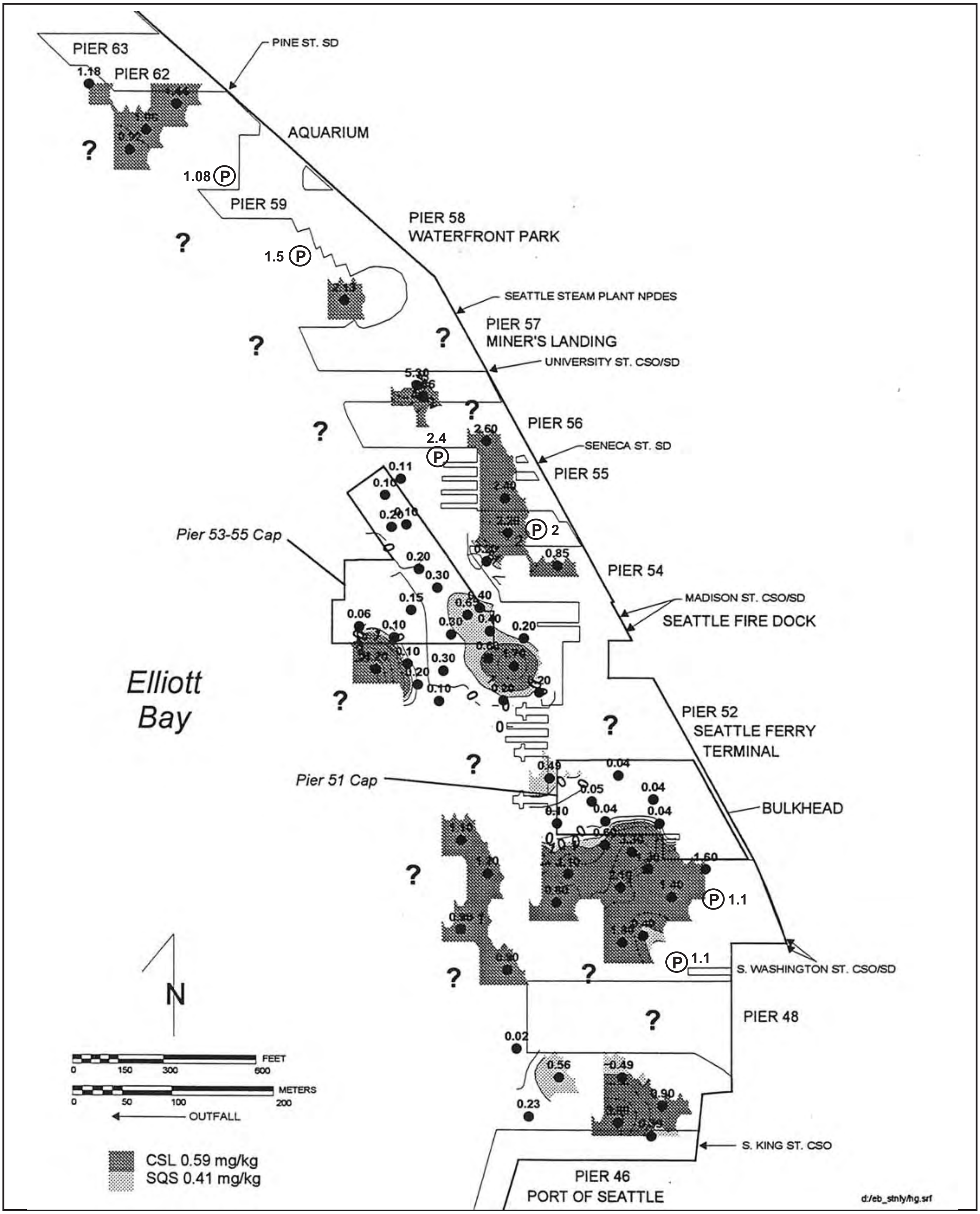
Exhibit B-5
November 2006 - AWV
Sediment Sampling Locations



Ⓟ Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-6
Surface Sediment Sample Locations, Data Sources, Sediment Remediation Sites and CSD and Storm Drain Locations

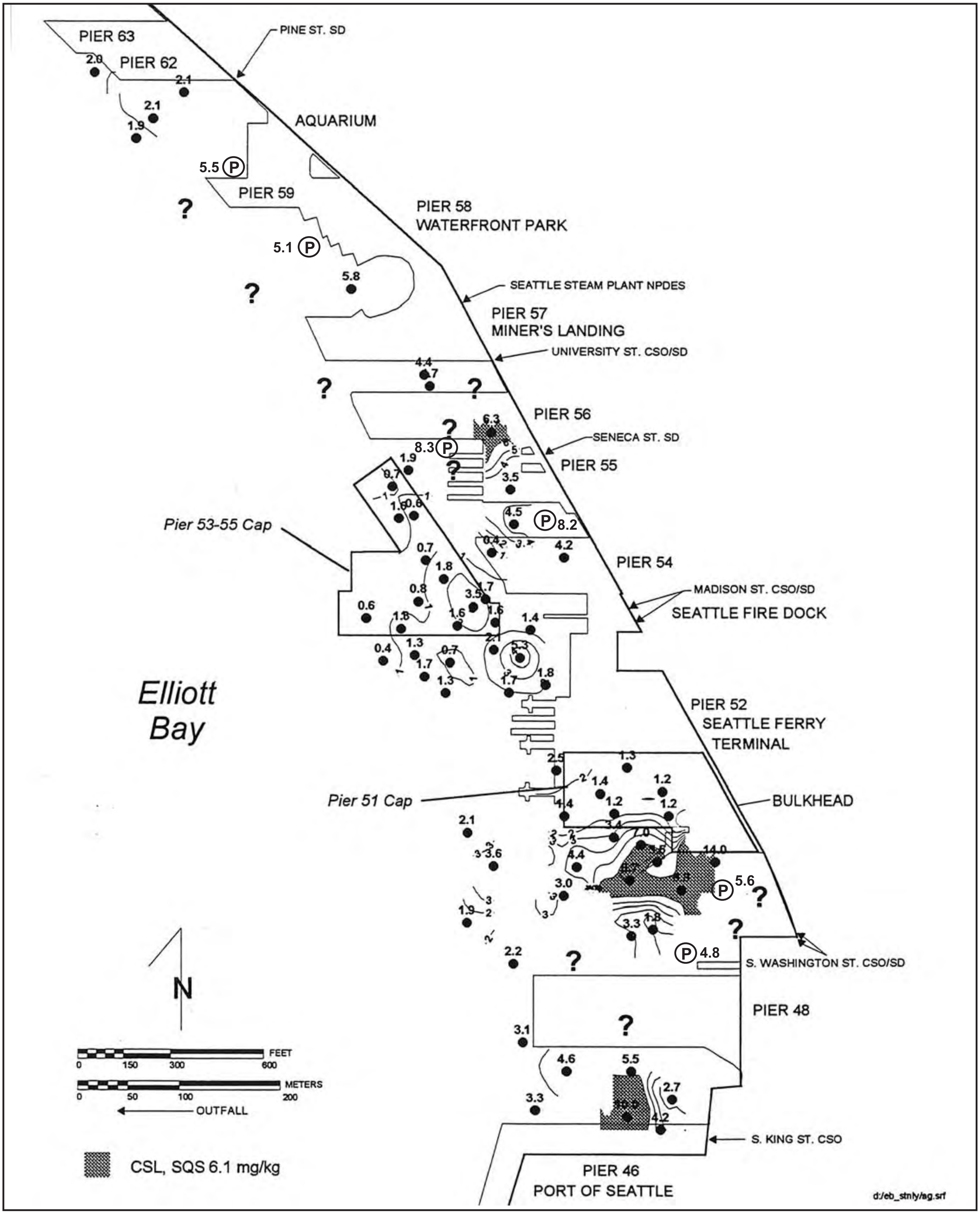


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-7
Surface Mercury Contours (mg/kg)

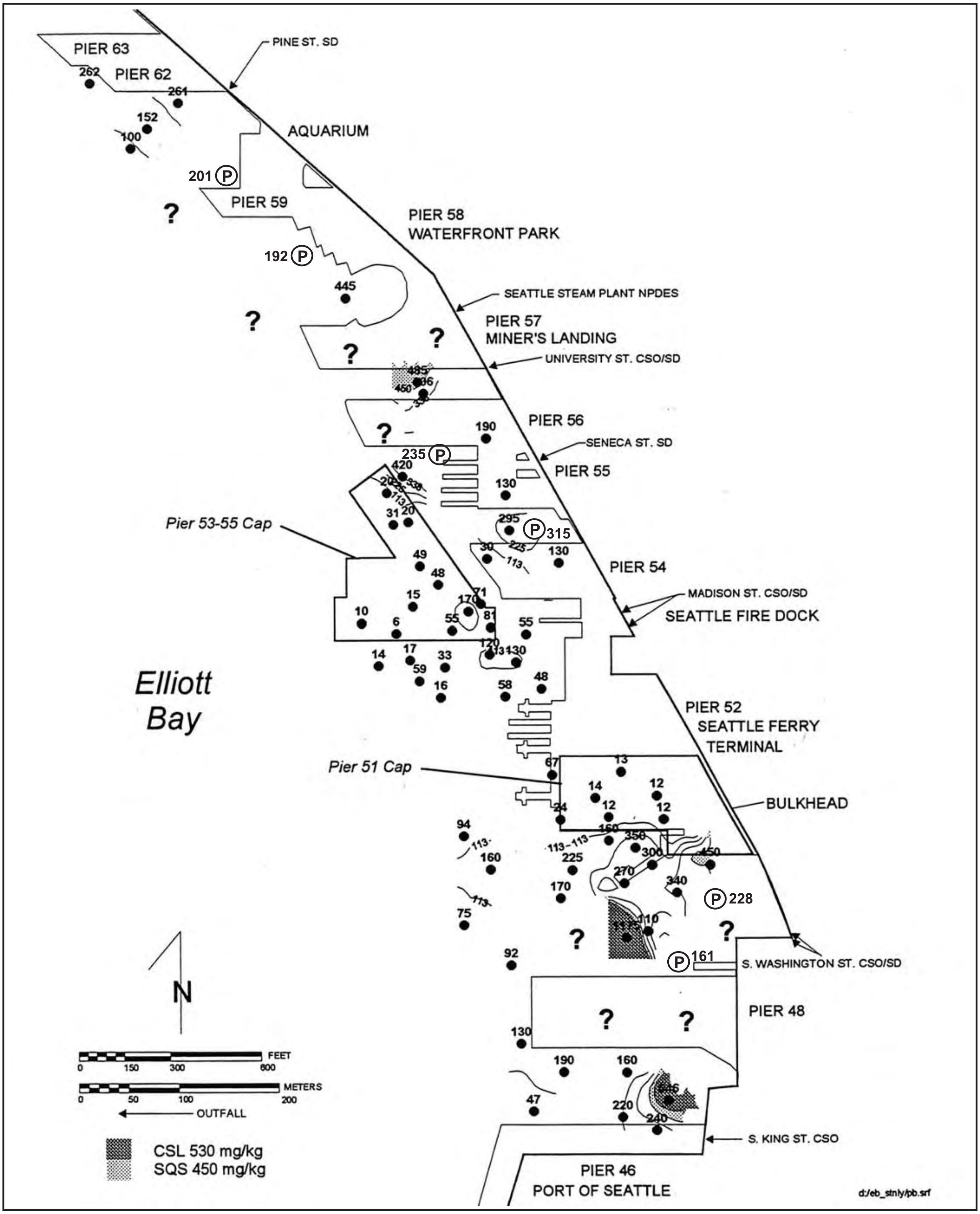


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-8
Surface Silver Contours (mg/kg)

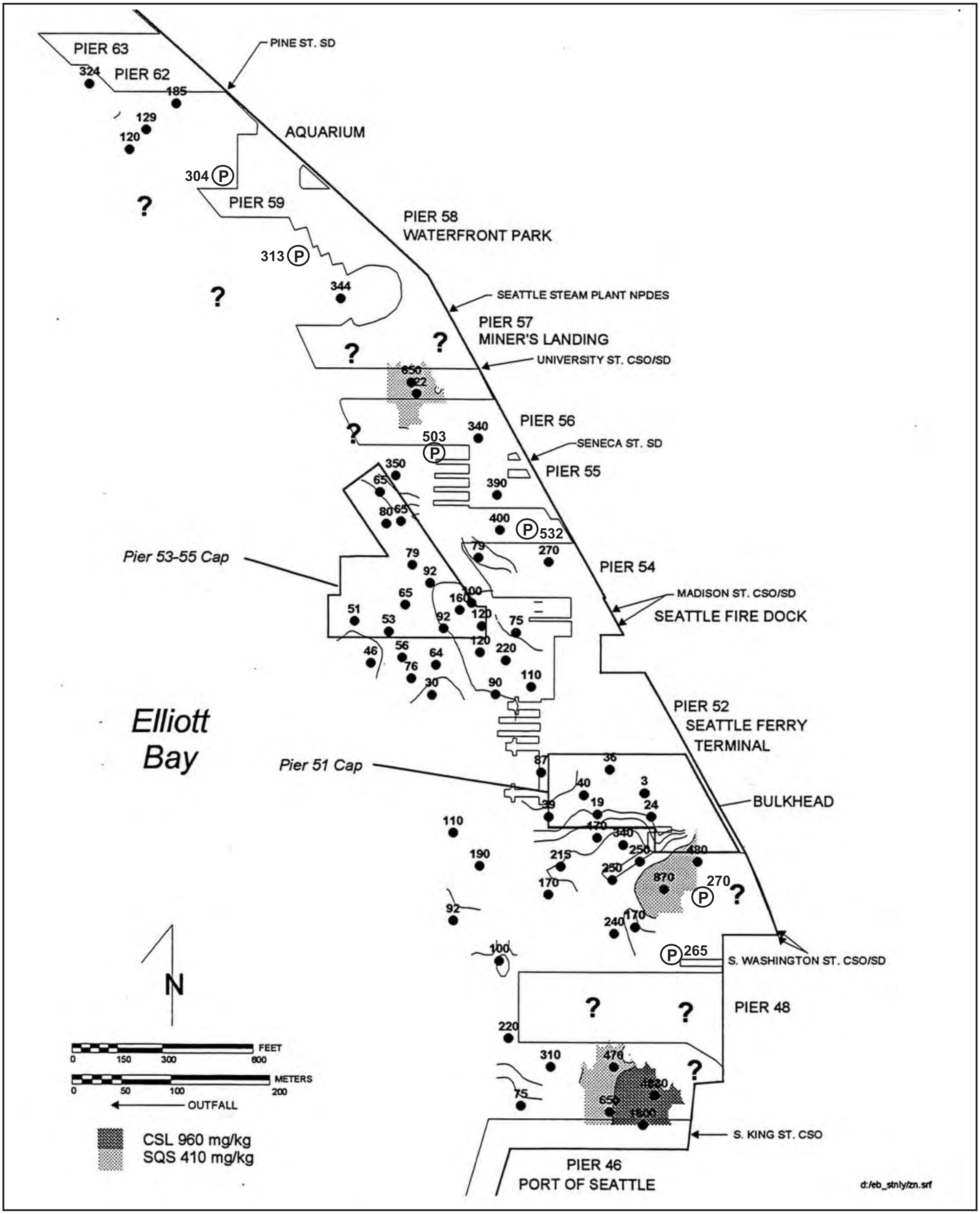


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-9
Surface Lead Contours (mg/kg)

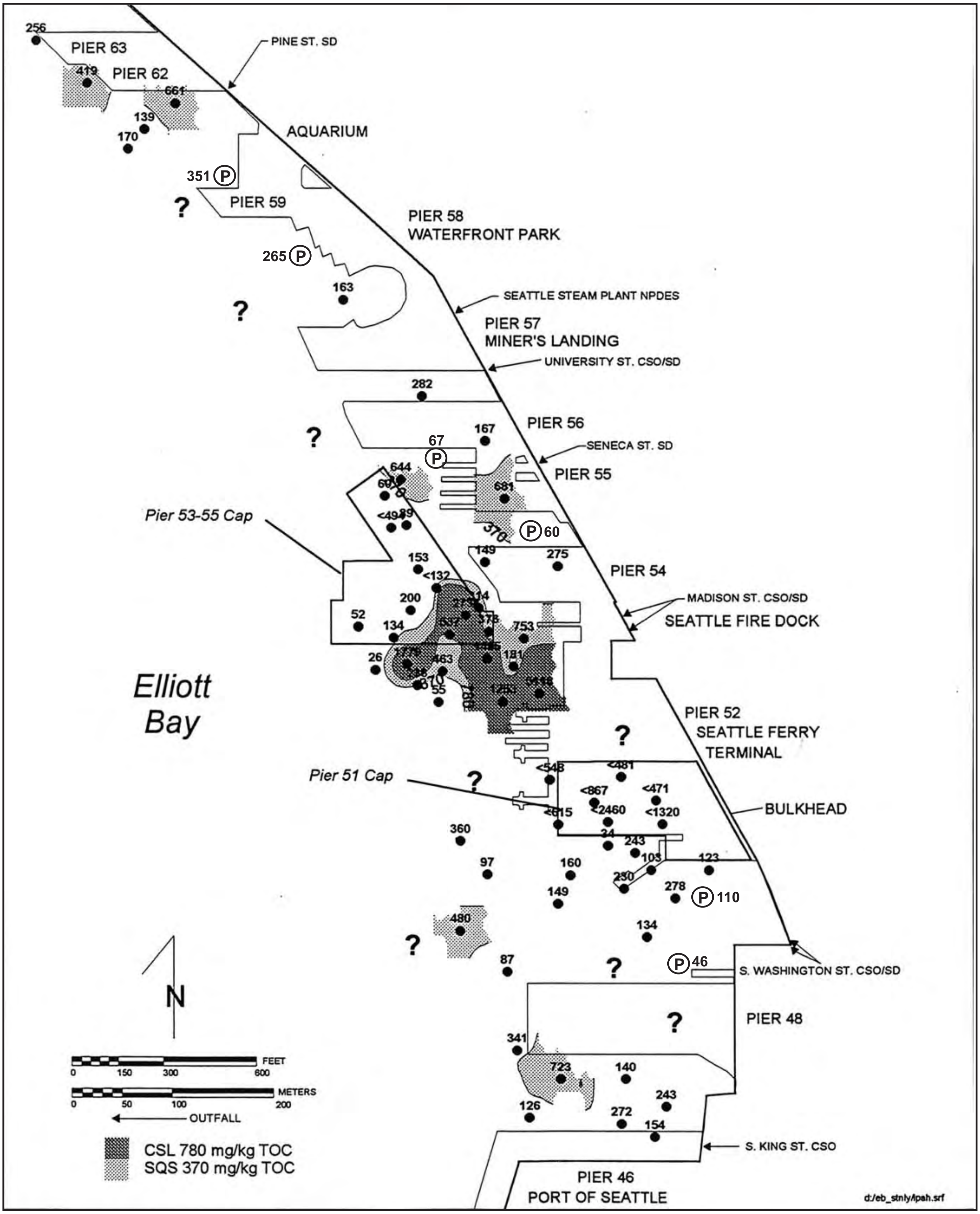


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-10
Surface Zinc Contours (mg/kg)

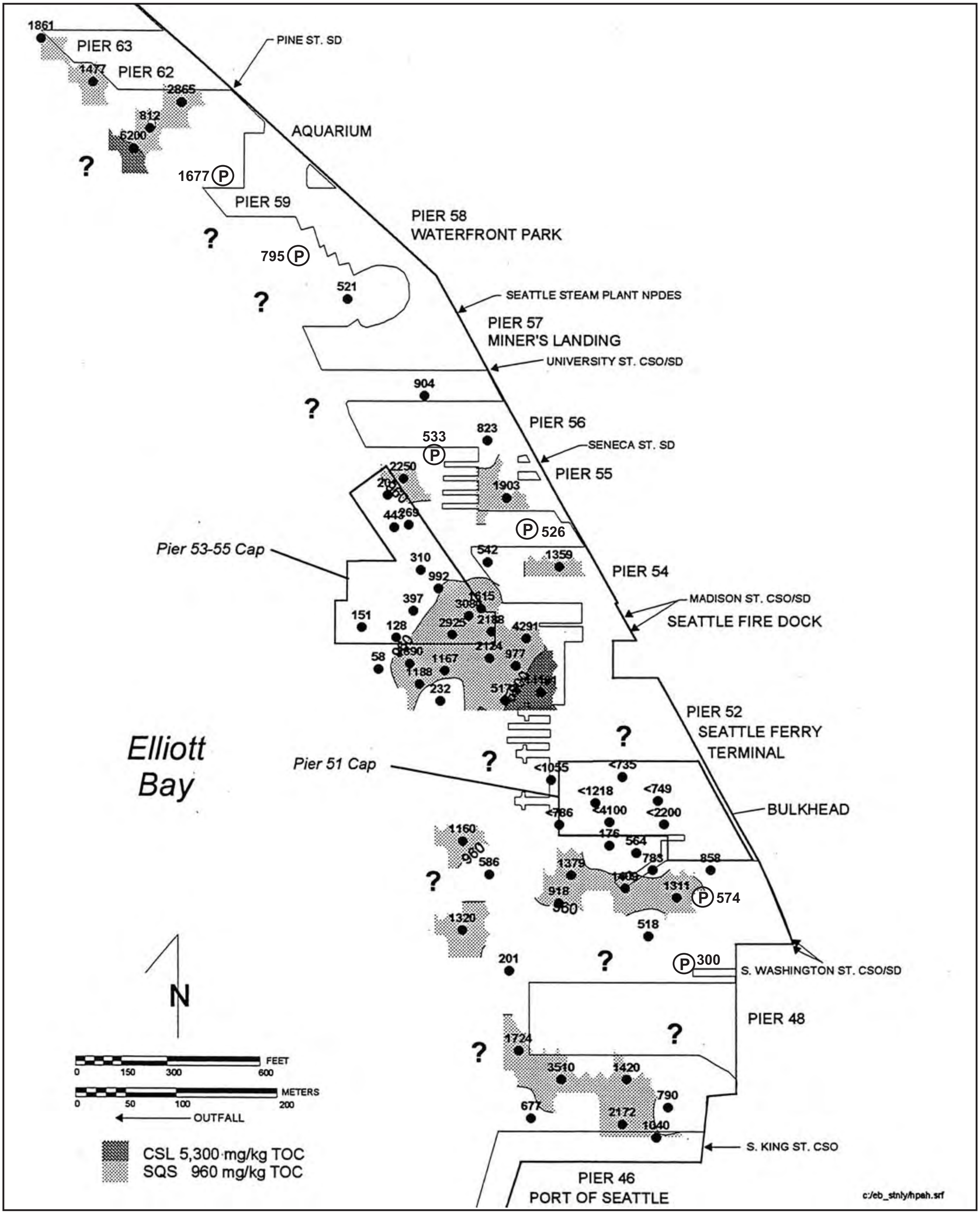


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-11
Surface LPAH Contours (mg/kg)



Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-12
Surface HPAH Contours (mg/kg)

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
HPAH Compounds												
13	COLMAN94	VG-11	VG-11	Jul-94	Benzo(a)anthracene	190	PPM		SQS	110	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Benzo(a)anthracene	300	PPM		SQS	110	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Benzo(a)anthracene	150	PPM		SQS	110	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(a)anthracene	530	PPM		SQS	110	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(a)anthracene	1200	PPM		SQS	110	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzo(a)anthracene	550	PPM		SQS	110	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Benzo(a)anthracene	210	PPM		SQS	110	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzo(a)anthracene	2200	PPM		SQS	110	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Benzo(a)anthracene	140	PPM		SQS	110	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Benzo(a)anthracene	330	PPM		SQS	110	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Benzo(a)anthracene	130	PPM		SQS	110	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Benzo(a)anthracene	300	PPM		CSL	270	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(a)anthracene	530	PPM		CSL	270	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(a)anthracene	1200	PPM		CSL	270	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzo(a)anthracene	550	PPM		CSL	270	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzo(a)anthracene	2200	PPM		CSL	270	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Benzo(a)anthracene	330	PPM		CSL	270	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Benzo(a)anthracene	120	PPM		SQS	110	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Benzo(a)anthracene	310	PPM		SQS	110	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Benzo(a)anthracene	210	PPM		SQS	110	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Benzo(a)anthracene	310	PPM		SQS	110	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Benzo(a)anthracene	140	PPM		SQS	110	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Benzo(a)anthracene	310	PPM		CSL	270	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Benzo(a)anthracene	310	PPM		CSL	270	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Benzo(a)pyrene	100	PPM		SQS	99	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Benzo(a)pyrene	140	PPM		SQS	99	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Benzo(a)pyrene	110	PPM		SQS	99	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Benzo(a)pyrene	150	PPM		SQS	99	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(a)pyrene	310	PPM		SQS	99	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(a)pyrene	630	PPM		SQS	99	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzo(a)pyrene	240	PPM		SQS	99	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Benzo(a)pyrene	130	PPM		SQS	99	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzo(a)pyrene	420	PPM		SQS	99	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Benzo(a)pyrene	110	PPM		SQS	99	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Benzo(a)pyrene	100	PPM		SQS	99	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(a)pyrene	310	PPM		CSL	210	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(a)pyrene	630	PPM		CSL	210	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzo(a)pyrene	240	PPM		CSL	210	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzo(a)pyrene	420	PPM		CSL	210	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Benzo(a)pyrene	150	PPM		SQS	99	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Benzo(a)pyrene	100	PPM		SQS	99	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Benzo(a)pyrene	320	PPM		SQS	99	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Benzo(a)pyrene	110	PPM		SQS	99	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Benzo(a)pyrene	200	PPM		SQS	99	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Benzo(a)pyrene	320	PPM		CSL	210	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Benzo(a)pyrene	110	PPM		SQS	99	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Benzo(a)pyrene	110	PPM		SQS	99	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Benzo(g,h,i)perylene	42	PPM		SQS	31	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Benzo(g,h,i)perylene	38	PPM		SQS	31	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Benzo(g,h,i)perylene	35	PPM		SQS	31	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Benzo(g,h,i)perylene	41	PPM		SQS	31	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(g,h,i)perylene	89	PPM		SQS	31	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(g,h,i)perylene	160	PPM		SQS	31	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzo(g,h,i)perylene	62	PPM		SQS	31	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Benzo(g,h,i)perylene	43	PPM		SQS	31	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzo(g,h,i)perylene	65	PPM		SQS	31	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Benzo(g,h,i)perylene	35	PPM		SQS	31	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Benzo(g,h,i)perylene	32	PPM		SQS	31	PPM	TOC
31	COLMAN94	WSF-D	S-1	Jul-94	Benzo(g,h,i)perylene	34	PPM		SQS	31	PPM	TOC
32	COLMAN94	WSF-E	S-1	Jul-94	Benzo(g,h,i)perylene	40	PPM		SQS	31	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzo(g,h,i)perylene	89	PPM		CSL	78	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzo(g,h,i)perylene	160	PPM		CSL	78	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Benzo(g,h,i)perylene	44	PPM	E	SQS	31	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Benzo(g,h,i)perylene	56	PPM		SQS	31	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Benzo(g,h,i)perylene	35	PPM		SQS	31	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

Map Location	SEDQUAL Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Criteria Type	Value	Unit	Basis
64	P53MON92	P53VG8	9201103	May-92	Benzo(g,h,i)perylene	93	PPM		SQS	31	PPM	TOC
49	P53MON92	S1	9200294	Feb-92	Benzo(g,h,i)perylene	59	PPM		SQS	31	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Benzo(g,h,i)perylene	64	PPM		SQS	31	PPM	TOC
56	P53MON92	UP2	L84-3	Nov-92	Benzo(g,h,i)perylene	54	PPM		SQS	31	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Benzo(g,h,i)perylene	57	PPM		SQS	31	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Benzo(g,h,i)perylene	93	PPM		CSL	78	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Benzo(g,h,i)perylene	38	PPM		SQS	31	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Benzo(g,h,i)perylene	42	PPM		SQS	31	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Benzofluoranthenes	320	PPM	E	SQS	230	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Benzofluoranthenes	300	PPM	E	SQS	230	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzofluoranthenes	690	PPM	E	SQS	230	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzofluoranthenes	1500	PPM	E	SQS	230	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzofluoranthenes	540	PPM	E	SQS	230	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Benzofluoranthenes	280	PPM	E	SQS	230	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzofluoranthenes	960	PPM		SQS	230	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Benzofluoranthenes	260	PPM	E	SQS	230	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Benzofluoranthenes	690	PPM	E	CSL	450	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Benzofluoranthenes	1500	PPM	E	CSL	450	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Benzofluoranthenes	540	PPM	E	CSL	450	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Benzofluoranthenes	960	PPM		CSL	450	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Benzofluoranthenes	720	PPM		SQS	230	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Benzofluoranthenes	640	PPM		SQS	230	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Benzofluoranthenes	720	PPM		CSL	450	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Benzofluoranthenes	640	PPM		CSL	450	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Benzofluoranthenes	900	PPM	LM	SQS	230	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Benzofluoranthenes	390	PPM	LM	SQS	230	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Benzofluoranthenes	900	PPM	LM	CSL	450	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Benzofluoranthenes	250	PPM	LM	SQS	230	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Benzofluoranthenes	240	PPM	LM	SQS	230	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Chrysene	220	PPM		SQS	110	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Chrysene	260	PPM		SQS	110	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Chrysene	160	PPM		SQS	110	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Chrysene	170	PPM		SQS	110	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Chrysene	640	PPM		SQS	110	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Chrysene	1500	PPM		SQS	110	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Chrysene	610	PPM		SQS	110	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Chrysene	230	PPM		SQS	110	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Chrysene	1800	PPM		SQS	110	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Chrysene	170	PPM		SQS	110	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Chrysene	350	PPM		SQS	110	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Chrysene	180	PPM		SQS	110	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Chrysene	120	PPM		SQS	110	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Chrysene	640	PPM		CSL	460	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Chrysene	1500	PPM		CSL	460	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Chrysene	610	PPM		CSL	460	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Chrysene	1800	PPM		CSL	460	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Chrysene	150	PPM		SQS	110	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Chrysene	660	PPM		SQS	110	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Chrysene	210	PPM		SQS	110	PPM	TOC
56	P53MON92	UP2	L84-3	Nov-92	Chrysene	120	PPM		SQS	110	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Chrysene	300	PPM		SQS	110	PPM	TOC
58	P53MON92	UP4	L84-5	Nov-92	Chrysene	160	PPM		SQS	110	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Chrysene	660	PPM		CSL	460	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Chrysene	290	PPM		SQS	110	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Chrysene	210	PPM		SQS	110	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Chrysene	380	PPM		SQS	110	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Chrysene	160	PPM		SQS	110	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Dibenzo(a,h)anthracene	14	PPM		SQS	12	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Dibenzo(a,h)anthracene	70	PPM		SQS	12	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Dibenzo(a,h)anthracene	21	PPM		SQS	12	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Dibenzo(a,h)anthracene	17	PPM		SQS	12	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Dibenzo(a,h)anthracene	23	PPM		SQS	12	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Dibenzo(a,h)anthracene	45	PPM		SQS	12	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Dibenzo(a,h)anthracene	90	PPM		SQS	12	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Dibenzo(a,h)anthracene	34	PPM		SQS	12	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Dibenzo(a,h)anthracene	19	PPM		SQS	12	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

Map	SEDQUAL								Criteria			
Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
27	COLMAN94	WSF-9	WSF-9	Jul-94	Dibenzo(a,h)anthracene	14	PPM		SQS	12	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Dibenzo(a,h)anthracene	57	PPM		SQS	12	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Dibenzo(a,h)anthracene	24	PPM		SQS	12	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Dibenzo(a,h)anthracene	19	PPM		SQS	12	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Dibenzo(a,h)anthracene	38	PPM		SQS	12	PPM	TOC
32	COLMAN94	WSF-E	S-4	Jul-94	Dibenzo(a,h)anthracene	34	PPM		SQS	12	PPM	TOC
32	COLMAN94	WSF-E	S-1	Jul-94	Dibenzo(a,h)anthracene	15	PPM		SQS	12	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Dibenzo(a,h)anthracene	70	PPM		CSL	33	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Dibenzo(a,h)anthracene	45	PPM		CSL	33	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Dibenzo(a,h)anthracene	90	PPM		CSL	33	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Dibenzo(a,h)anthracene	34	PPM		CSL	33	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Dibenzo(a,h)anthracene	57	PPM		CSL	33	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Dibenzo(a,h)anthracene	38	PPM		CSL	33	PPM	TOC
32	COLMAN94	WSF-E	S-4	Jul-94	Dibenzo(a,h)anthracene	34	PPM		CSL	33	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Dibenzo(a,h)anthracene	30	PPM	E	SQS	12	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Dibenzo(a,h)anthracene	23	PPM		SQS	12	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Dibenzo(a,h)anthracene	21	PPM		SQS	12	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Dibenzo(a,h)anthracene	19	PPM		SQS	12	PPM	TOC
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Fluoranthene	360	PPM		SQS	160	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Fluoranthene	540	PPM		SQS	160	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Fluoranthene	930	PPM		SQS	160	PPM	TOC
16	COLMAN94	VG-6	VG-6	Jul-94	Fluoranthene	240	PPM		SQS	160	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Fluoranthene	440	PPM		SQS	160	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Fluoranthene	900	PPM		SQS	160	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Fluoranthene	4600	PPM		SQS	160	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Fluoranthene	1300	PPM		SQS	160	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Fluoranthene	550	PPM		SQS	160	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Fluoranthene	15000	PPM		SQS	160	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Fluoranthene	410	PPM		SQS	160	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Fluoranthene	170	PPM		SQS	160	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Fluoranthene	1200	PPM		SQS	160	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Fluoranthene	480	PPM		SQS	160	PPM	TOC
30	COLMAN94	WSF-C	S-1.5	Jul-94	Fluoranthene	210	PPM		SQS	160	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Fluoranthene	4600	PPM		CSL	1200	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Fluoranthene	1300	PPM		CSL	1200	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Fluoranthene	15000	PPM		CSL	1200	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Fluoranthene	340	PPM		SQS	160	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Fluoranthene	370	PPM		SQS	160	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Fluoranthene	1500	PPM		SQS	160	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Fluoranthene	1500	PPM		CSL	1200	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Fluoranthene	1400	PPM		SQS	160	PPM	TOC
55	P53MON92	UP1	L84-2	Nov-92	Fluoranthene	170	PPM		SQS	160	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Fluoranthene	380	PPM		SQS	160	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Fluoranthene	510	PPM		SQS	160	PPM	TOC
58	P53MON92	UP4	L84-5	Nov-92	Fluoranthene	260	PPM		SQS	160	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Fluoranthene	1400	PPM		CSL	1200	PPM	TOC
59	P53MON93	P53VG1	L1145-2	May-93	Fluoranthene	190	PPM		SQS	160	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Fluoranthene	1200	PPM		SQS	160	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Fluoranthene	690	PPM		SQS	160	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Fluoranthene	1000	PPM		SQS	160	PPM	TOC
72	P53MON93	P53VG6	L1145-7	May-93	Fluoranthene	180	PPM		SQS	160	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Fluoranthene	340	PPM		SQS	160	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Indeno(1,2,3-c,d)pyrene	39	PPM		SQS	34	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Indeno(1,2,3-c,d)pyrene	46	PPM		SQS	34	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Indeno(1,2,3-c,d)pyrene	39	PPM		SQS	34	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Indeno(1,2,3-c,d)pyrene	58	PPM		SQS	34	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Indeno(1,2,3-c,d)pyrene	100	PPM		SQS	34	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Indeno(1,2,3-c,d)pyrene	200	PPM		SQS	34	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Indeno(1,2,3-c,d)pyrene	74	PPM		SQS	34	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Indeno(1,2,3-c,d)pyrene	46	PPM		SQS	34	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Indeno(1,2,3-c,d)pyrene	96	PPM		SQS	34	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Indeno(1,2,3-c,d)pyrene	38	PPM		SQS	34	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Indeno(1,2,3-c,d)pyrene	40	PPM		SQS	34	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Indeno(1,2,3-c,d)pyrene	48	PPM		SQS	34	PPM	TOC
32	COLMAN94	WSF-E	S-4	Jul-94	Indeno(1,2,3-c,d)pyrene	40	PPM		SQS	34	PPM	TOC
32	COLMAN94	WSF-E	S-1	Jul-94	Indeno(1,2,3-c,d)pyrene	40	PPM		SQS	34	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
22	COLMAN94	WSF-2	WSF-2	Jul-94	Indeno(1,2,3-c,d)pyrene	100	PPM		CSL	88	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Indeno(1,2,3-c,d)pyrene	200	PPM		CSL	88	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Indeno(1,2,3-c,d)pyrene	96	PPM		CSL	88	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Indeno(1,2,3-c,d)pyrene	60	PPM	E	SQS	34	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Indeno(1,2,3-c,d)pyrene	62	PPM		SQS	34	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Indeno(1,2,3-c,d)pyrene	43	PPM		SQS	34	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Indeno(1,2,3-c,d)pyrene	110	PPM		SQS	34	PPM	TOC
49	P53MON92	S1	9200294	Feb-92	Indeno(1,2,3-c,d)pyrene	76	PPM		SQS	34	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Indeno(1,2,3-c,d)pyrene	83	PPM		SQS	34	PPM	TOC
56	P53MON92	UP2	L84-3	Nov-92	Indeno(1,2,3-c,d)pyrene	54	PPM		SQS	34	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Indeno(1,2,3-c,d)pyrene	80	PPM		SQS	34	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Indeno(1,2,3-c,d)pyrene	110	PPM		CSL	88	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Indeno(1,2,3-c,d)pyrene	40	PPM		SQS	34	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Indeno(1,2,3-c,d)pyrene	50	PPM		SQS	34	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Pyrene	2500	PPM		SQS	1000	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Pyrene	1100	PPM		SQS	1000	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Pyrene	8400	PPM		SQS	1000	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Pyrene	2500	PPM		CSL	1400	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Pyrene	8400	PPM		CSL	1400	PPM	TOC
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Total HPAHs	1300	PPM	LM	SQS	960	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Total HPAHs	1800	PPM	E	SQS	960	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Total HPAHs	2600	PPM	E	SQS	960	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Total HPAHs	1400	PPM	E	SQS	960	PPM	TOC
18	COLMAN94	WSF-10	WSF-10	Jul-94	Total HPAHs	1000	PPM	E	SQS	960	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Total HPAHs	3900	PPM	E	SQS	960	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Total HPAHs	12000	PPM	E	SQS	960	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Total HPAHs	4600	PPM	E	SQS	960	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Total HPAHs	1500	PPM	E	SQS	960	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Total HPAHs	29000	PPM		SQS	960	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Total HPAHs	1300	PPM		SQS	960	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Total HPAHs	3200	PPM	E	SQS	960	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Total HPAHs	1500	PPM	E	SQS	960	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Total HPAHs	1000	PPM	E	SQS	960	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Total HPAHs	12000	PPM	E	CSL	5300	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Total HPAHs	29000	PPM		CSL	5300	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Total HPAHs	2500	PPM	G	SQS	960	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Total HPAHs	990	PPM	LM	SQS	960	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Total HPAHs	3800	PPM		SQS	960	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Total HPAHs	5800	PPM		SQS	960	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Total HPAHs	5800	PPM		CSL	5300	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Total HPAHs	4500	PPM	LM	SQS	960	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Total HPAHs	1300	PPM	LM	SQS	960	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Total HPAHs	1900	PPM	LM	SQS	960	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Total HPAHs	3100	PPM	LM	SQS	960	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Total HPAHs	1900	PPM	LM	SQS	960	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Total HPAHs	2900	PPM	LM	SQS	960	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Total HPAHs	1100	PPM	LM	SQS	960	PPM	TOC
LPAH Compounds												
14	COLMAN94	VG-3	VG-3	Jul-94	2-Methylnaphthalene	140	PPM		SQS	38	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	2-Methylnaphthalene	100	PPM		SQS	38	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	2-Methylnaphthalene	420	PPM		SQS	38	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	2-Methylnaphthalene	44	PPM		SQS	38	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	2-Methylnaphthalene	110	PPM		SQS	38	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	2-Methylnaphthalene	150	PPM		SQS	38	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	2-Methylnaphthalene	77	PPM		SQS	38	PPM	TOC
32	COLMAN94	WSF-E	S-4	Jul-94	2-Methylnaphthalene	66	PPM		SQS	38	PPM	TOC
32	COLMAN94	WSF-E	S-2	Jul-94	2-Methylnaphthalene	52	PPM		SQS	38	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	2-Methylnaphthalene	140	PPM		CSL	64	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	2-Methylnaphthalene	100	PPM		CSL	64	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	2-Methylnaphthalene	420	PPM		CSL	64	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	2-Methylnaphthalene	110	PPM		CSL	64	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	2-Methylnaphthalene	150	PPM		CSL	64	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	2-Methylnaphthalene	77	PPM		CSL	64	PPM	TOC
32	COLMAN94	WSF-E	S-4	Jul-94	2-Methylnaphthalene	66	PPM		CSL	64	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	2-Methylnaphthalene	510	PPM		SQS	38	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	2-Methylnaphthalene	250	PPM		SQS	38	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
63	P53MON93	P53VG5	L1145-6	May-93	2-Methylnaphthalene	160	PPM		SQS	38	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	2-Methylnaphthalene	510	PPM		CSL	64	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	2-Methylnaphthalene	250	PPM		CSL	64	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	2-Methylnaphthalene	160	PPM		CSL	64	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Acenaphthene	260	PPM		SQS	16	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Acenaphthene	120	PPM		SQS	16	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Acenaphthene	30	PPM		SQS	16	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Acenaphthene	24	PPM		SQS	16	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Acenaphthene	27	PPM		SQS	16	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Acenaphthene	370	PPM		SQS	16	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Acenaphthene	140	PPM		SQS	16	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Acenaphthene	28	PPM		SQS	16	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Acenaphthene	6500	PPM		SQS	16	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Acenaphthene	110	PPM		SQS	16	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Acenaphthene	130	PPM		SQS	16	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Acenaphthene	290	PPM		SQS	16	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Acenaphthene	150	PPM		SQS	16	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Acenaphthene	79	PPM		SQS	16	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Acenaphthene	67	PPM		SQS	16	PPM	TOC
32	COLMAN94	WSF-E	S-3	Jul-94	Acenaphthene	37	PPM		SQS	16	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Acenaphthene	260	PPM		CSL	57	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Acenaphthene	120	PPM		CSL	57	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Acenaphthene	370	PPM		CSL	57	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Acenaphthene	140	PPM		CSL	57	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Acenaphthene	6500	PPM		CSL	57	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Acenaphthene	110	PPM		CSL	57	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Acenaphthene	130	PPM		CSL	57	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Acenaphthene	290	PPM		CSL	57	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Acenaphthene	150	PPM		CSL	57	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Acenaphthene	79	PPM		CSL	57	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Acenaphthene	67	PPM		CSL	57	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Acenaphthene	19	PPM	E	SQS	16	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Acenaphthene	19	PPM		SQS	16	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Acenaphthene	80	PPM		SQS	16	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Acenaphthene	80	PPM		CSL	57	PPM	TOC
59	P53MON93	P53VG1	L1145-2	May-93	Acenaphthene	27	PPM		SQS	16	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Acenaphthene	820	PPM		SQS	16	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Acenaphthene	400	PPM		SQS	16	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Acenaphthene	380	PPM		SQS	16	PPM	TOC
72	P53MON93	P53VG6	L1145-7	May-93	Acenaphthene	33	PPM		SQS	16	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Acenaphthene	29	PPM		SQS	16	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Acenaphthene	820	PPM		CSL	57	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Acenaphthene	400	PPM		CSL	57	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Acenaphthene	380	PPM		CSL	57	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Acenaphthylene	100	PPM		SQS	66	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Acenaphthylene	100	PPM		SQS	66	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Acenaphthylene	100	PPM		CSL	66	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Acenaphthylene	100	PPM		CSL	66	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Anthracene	250	PPM		SQS	220	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Anthracene	1000	PPM		SQS	220	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Anthracene	230	PPM		SQS	220	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Anthracene	2600	PPM		SQS	220	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Anthracene	350	PPM		SQS	220	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Anthracene	2600	PPM		CSL	1200	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Anthracene	230	PPM		SQS	220	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Anthracene	230	PPM		SQS	220	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Fluorene	210	PPM		SQS	23	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Fluorene	99	PPM		SQS	23	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Fluorene	68	PPM		SQS	23	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Fluorene	33	PPM		SQS	23	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Fluorene	86	PPM		SQS	23	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Fluorene	540	PPM		SQS	23	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Fluorene	140	PPM		SQS	23	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Fluorene	43	PPM		SQS	23	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Fluorene	5700	PPM		SQS	23	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Fluorene	43	PPM		SQS	23	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

Map Location	SEDQUAL Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Criteria Type	Value	Unit	Basis
29	COLMAN94	WSF-B	S-2	Aug-94	Fluorene	68	PPM		SQS	23	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Fluorene	360	PPM		SQS	23	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Fluorene	98	PPM		SQS	23	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Fluorene	52	PPM		SQS	23	PPM	TOC
32	COLMAN94	WSF-E	S-5B	Jul-94	Fluorene	54	PPM		SQS	23	PPM	TOC
32	COLMAN94	WSF-E	S-3	Jul-94	Fluorene	25	PPM		SQS	23	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Fluorene	210	PPM		CSL	79	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Fluorene	99	PPM		CSL	79	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Fluorene	86	PPM		CSL	79	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Fluorene	540	PPM		CSL	79	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Fluorene	140	PPM		CSL	79	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Fluorene	5700	PPM		CSL	79	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Fluorene	360	PPM		CSL	79	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Fluorene	98	PPM		CSL	79	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Fluorene	27	PPM	E	SQS	23	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Fluorene	25	PPM		SQS	23	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Fluorene	25	PPM		SQS	23	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Fluorene	27	PPM		SQS	23	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Fluorene	85	PPM		SQS	23	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Fluorene	85	PPM		CSL	79	PPM	TOC
59	P53MON93	P53VG1	L1145-2	May-93	Fluorene	33	PPM		SQS	23	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Fluorene	740	PPM		SQS	23	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Fluorene	360	PPM		SQS	23	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Fluorene	380	PPM		SQS	23	PPM	TOC
72	P53MON93	P53VG6	L1145-7	May-93	Fluorene	40	PPM		SQS	23	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Fluorene	57	PPM		SQS	23	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Fluorene	740	PPM		CSL	79	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Fluorene	360	PPM		CSL	79	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Fluorene	380	PPM		CSL	79	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Naphthalene	270	PPM		SQS	99	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Naphthalene	120	PPM		SQS	99	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Naphthalene	100	PPM		SQS	99	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Naphthalene	1100	PPM		SQS	99	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Naphthalene	110	PPM		SQS	99	PPM	TOC
29	COLMAN94	WSF-B	S-5	Aug-94	Naphthalene	100	PPM		SQS	99	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Naphthalene	1600	PPM		SQS	99	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Naphthalene	360	PPM		SQS	99	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Naphthalene	230	PPM		SQS	99	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Naphthalene	270	PPM		CSL	170	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Naphthalene	1100	PPM		CSL	170	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Naphthalene	1600	PPM		CSL	170	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Naphthalene	360	PPM		CSL	170	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Naphthalene	230	PPM		CSL	170	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Naphthalene	1000	PPM		SQS	99	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Naphthalene	730	PPM		SQS	99	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Naphthalene	360	PPM		SQS	99	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Naphthalene	1000	PPM		CSL	170	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Naphthalene	730	PPM		CSL	170	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Naphthalene	360	PPM		CSL	170	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Phenanthrene	590	PPM		SQS	100	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Phenanthrene	220	PPM		SQS	100	PPM	TOC
17	COLMAN94	WSF-1	WSF-1	Jul-94	Phenanthrene	120	PPM		SQS	100	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Phenanthrene	520	PPM		SQS	100	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Phenanthrene	2900	PPM		SQS	100	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Phenanthrene	620	PPM		SQS	100	PPM	TOC
25	COLMAN94	WSF-7	WSF-7	Jul-94	Phenanthrene	140	PPM		SQS	100	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Phenanthrene	20000	PPM		SQS	100	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Phenanthrene	180	PPM		SQS	100	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Phenanthrene	1000	PPM		SQS	100	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Phenanthrene	130	PPM		SQS	100	PPM	TOC
30	COLMAN94	WSF-C	S-1	Jul-94	Phenanthrene	110	PPM		SQS	100	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Phenanthrene	590	PPM		CSL	480	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Phenanthrene	520	PPM		CSL	480	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Phenanthrene	2900	PPM		CSL	480	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Phenanthrene	620	PPM		CSL	480	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Phenanthrene	20000	PPM		CSL	480	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
29	COLMAN94	WSF-B	S-1	Aug-94	Phenanthrene	1000	PPM		CSL	480	PPM	TOC
78	EBCHEM	SS-03	SS-03	Oct-85	Phenanthrene	110	PPM	E	SQS	100	PPM	TOC
41	HSSEAT90	LTEH06	9000913	Oct-90	Phenanthrene	170	PPM		SQS	100	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Phenanthrene	130	PPM		SQS	100	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Phenanthrene	130	PPM		SQS	100	PPM	TOC
64	P53MON92	P53VG8	9201103	May-92	Phenanthrene	120	PPM		SQS	100	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Phenanthrene	130	PPM		SQS	100	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Phenanthrene	350	PPM		SQS	100	PPM	TOC
59	P53MON93	P53VG1	L1145-2	May-93	Phenanthrene	140	PPM		SQS	100	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Phenanthrene	1900	PPM		SQS	100	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Phenanthrene	1000	PPM		SQS	100	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Phenanthrene	1100	PPM		SQS	100	PPM	TOC
72	P53MON93	P53VG6	L1145-7	May-93	Phenanthrene	160	PPM		SQS	100	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Phenanthrene	290	PPM		SQS	100	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Phenanthrene	1900	PPM		CSL	480	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Phenanthrene	1000	PPM		CSL	480	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Phenanthrene	1100	PPM		CSL	480	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Total LPAHs	1400	PPM		SQS	370	PPM	TOC
14	COLMAN94	VG-3	VG-3	Jul-94	Total LPAHs	490	PPM		SQS	370	PPM	TOC
15	COLMAN94	VG-5	VG-5	Jul-94	Total LPAHs	530	PPM		SQS	370	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Total LPAHs	970	PPM		SQS	370	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Total LPAHs	5100	PPM		SQS	370	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Total LPAHs	1200	PPM		SQS	370	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Total LPAHs	36000	PPM		SQS	370	PPM	TOC
28	COLMAN94	WSF-A	S-1	Aug-94	Total LPAHs	540	PPM		SQS	370	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Total LPAHs	1900	PPM		SQS	370	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Total LPAHs	2400	PPM		SQS	370	PPM	TOC
30	COLMAN94	WSF-C	S-4	Jul-94	Total LPAHs	590	PPM		SQS	370	PPM	TOC
30	COLMAN94	WSF-C	S-2	Jul-94	Total LPAHs	450	PPM		SQS	370	PPM	TOC
13	COLMAN94	VG-11	VG-11	Jul-94	Total LPAHs	1400	PPM		CSL	780	PPM	TOC
22	COLMAN94	WSF-2	WSF-2	Jul-94	Total LPAHs	970	PPM		CSL	780	PPM	TOC
23	COLMAN94	WSF-3	WSF-3	Jul-94	Total LPAHs	5100	PPM		CSL	780	PPM	TOC
24	COLMAN94	WSF-4	WSF-4	Jul-94	Total LPAHs	1200	PPM		CSL	780	PPM	TOC
28	COLMAN94	WSF-A	S-4	Aug-94	Total LPAHs	36000	PPM		CSL	780	PPM	TOC
29	COLMAN94	WSF-B	S-2	Aug-94	Total LPAHs	1900	PPM		CSL	780	PPM	TOC
29	COLMAN94	WSF-B	S-1	Aug-94	Total LPAHs	2400	PPM		CSL	780	PPM	TOC
42	MSMPNOAA	26-2-183	183	Jun-98	Total LPAHs	630	PPM		SQS	370	PPM	TOC
43	MSMPNOAA	26-3-184	184	Jun-98	Total LPAHs	420	PPM		SQS	370	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Total LPAHs	670	PPM		SQS	370	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Total LPAHs	4800	PPM		SQS	370	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Total LPAHs	2600	PPM		SQS	370	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Total LPAHs	2500	PPM		SQS	370	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Total LPAHs	450	PPM		SQS	370	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Total LPAHs	4800	PPM		CSL	780	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Total LPAHs	2600	PPM		CSL	780	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Total LPAHs	2500	PPM		CSL	780	PPM	TOC
Misc. Organic Compounds												
38	DENN9496	LTBD22	L3992-1	Jun-94	1,4-Dichlorobenzene	8.3	PPM	G	SQS	3.1	PPM	TOC
39	DENN9496	LTBD25	L3992-3	Jun-94	1,4-Dichlorobenzene	100	PPM	G	SQS	3.1	PPM	TOC
39	DENN9496	LTBD25	L3992-3	Jun-94	1,4-Dichlorobenzene	100	PPM	G	CSL	9	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	1,4-Dichlorobenzene	45	PPM		SQS	3.1	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	1,4-Dichlorobenzene	45	PPM		CSL	9	PPM	TOC
66	P53MON93	P53C2	L1211-6DUP	May-93	2,4-Dimethylphenol	4400	PPB		SQS	29	PPB	DRY
66	P53MON93	P53C2	L1211-6DUP	May-93	2,4-Dimethylphenol	4400	PPB		CSL	29	PPB	DRY
42	MSMPNOAA	26-2-183	183	Jun-98	Benzoic Acid	1100	PPB	J	SQS	650	PPB	DRY
43	MSMPNOAA	26-3-184	184	Jun-98	Benzoic Acid	1300	PPB	J	SQS	650	PPB	DRY
42	MSMPNOAA	26-2-183	183	Jun-98	Benzoic Acid	1100	PPB	J	CSL	650	PPB	DRY
43	MSMPNOAA	26-3-184	184	Jun-98	Benzoic Acid	1300	PPB	J	CSL	650	PPB	DRY
56	P53MON92	UP2	L84-3	Nov-92	Benzoic Acid	3700	PPB		SQS	650	PPB	DRY
57	P53MON92	UP3	L84-6	Nov-92	Benzoic Acid	1600	PPB		SQS	650	PPB	DRY
56	P53MON92	UP2	L84-3	Nov-92	Benzoic Acid	3700	PPB		CSL	650	PPB	DRY
57	P53MON92	UP3	L84-6	Nov-92	Benzoic Acid	1600	PPB		CSL	650	PPB	DRY
74	PIER6465	HC-B02	HCB02_8_14	May-90	Benzoic Acid	2300	PPB	E	SQS	650	PPB	DRY
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Benzoic Acid	870	PPB	E	SQS	650	PPB	DRY
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Benzoic Acid	690	PPB	E	SQS	650	PPB	DRY
74	PIER6465	HC-B02	HCB02_8_14	May-90	Benzoic Acid	2300	PPB	E	CSL	650	PPB	DRY

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Benzoic Acid	870	PPB	E	CSL	650	PPB	DRY
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Benzoic Acid	690	PPB	E	CSL	650	PPB	DRY
38	DENN9496	LTBD22	L3992-1	Jun-94	Bis(2-ethylhexyl)phthalate	220	PPM		SQS	47	PPM	TOC
39	DENN9496	LTBD25	L9317-1	Aug-96	Bis(2-ethylhexyl)phthalate	72	PPM		SQS	47	PPM	TOC
39	DENN9496	LTBD25	L3992-3	Jun-94	Bis(2-ethylhexyl)phthalate	390	PPM		SQS	47	PPM	TOC
38	DENN9496	LTBD22	L3992-1	Jun-94	Bis(2-ethylhexyl)phthalate	220	PPM		CSL	78	PPM	TOC
39	DENN9496	LTBD25	L3992-3	Jun-94	Bis(2-ethylhexyl)phthalate	390	PPM		CSL	78	PPM	TOC
40	HSDENN92	LTBD25	9201379	Jul-92	Bis(2-ethylhexyl)phthalate	180	PPM		SQS	47	PPM	TOC
40	HSDENN92	LTBD25	9201379	Jul-92	Bis(2-ethylhexyl)phthalate	180	PPM		CSL	78	PPM	TOC
74	PIER6465	HC-B02	HCB02_20_30	May-90	Bis(2-ethylhexyl)phthalate	51	PPM		SQS	47	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	120	PPM		SQS	47	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	100	PPM	E	SQS	47	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	98	PPM	E	SQS	47	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	120	PPM		CSL	78	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	100	PPM	E	CSL	78	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Bis(2-ethylhexyl)phthalate	98	PPM	E	CSL	78	PPM	TOC
38	DENN9496	LTBD22	L3992-1	Jun-94	Butyl benzyl phthalate	14	PPM		SQS	4.9	PPM	TOC
38	DENN9496	LTBD22	L3992-1	Jun-94	Dibenzofuran	28	PPM		SQS	15	PPM	TOC
39	DENN9496	LTBD25	L3992-3	Jun-94	Dibenzofuran	36	PPM		SQS	15	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Dibenzofuran	61	PPM		SQS	15	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Dibenzofuran	61	PPM		CSL	58	PPM	TOC
59	P53MON93	P53VG1	L1145-2	May-93	Dibenzofuran	22	PPM		SQS	15	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Dibenzofuran	530	PPM		SQS	15	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Dibenzofuran	260	PPM		SQS	15	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Dibenzofuran	260	PPM		SQS	15	PPM	TOC
72	P53MON93	P53VG6	L1145-7	May-93	Dibenzofuran	26	PPM		SQS	15	PPM	TOC
64	P53MON93	P53VG8	L1145-12	May-93	Dibenzofuran	27	PPM		SQS	15	PPM	TOC
70	P53MON93	P53VG10	L1145-9	May-93	Dibenzofuran	530	PPM		CSL	58	PPM	TOC
71	P53MON93	P53VG11	L1145-10	May-93	Dibenzofuran	260	PPM		CSL	58	PPM	TOC
63	P53MON93	P53VG5	L1145-6	May-93	Dibenzofuran	260	PPM		CSL	58	PPM	TOC
73	PIER6465	HC-B01	HCB01_8_14	May-90	Dibenzofuran	56	PPM	E	SQS	15	PPM	TOC
74	PIER6465	HC-B02	HCB02_0_4	May-90	Dibenzofuran	73	PPM		SQS	15	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Dibenzofuran	36	PPM	E	SQS	15	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Dibenzofuran	100	PPM	E	SQS	15	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Dibenzofuran	110	PPM	E	SQS	15	PPM	TOC
74	PIER6465	HC-B02	HCB02_0_4	May-90	Dibenzofuran	73	PPM		CSL	58	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Dibenzofuran	100	PPM	E	CSL	58	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Dibenzofuran	110	PPM	E	CSL	58	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Dimethylphthalate	95	PPM	E	SQS	53	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Dimethylphthalate	110	PPM	E	SQS	53	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Dimethylphthalate	170	PPM	E	SQS	53	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Dimethylphthalate	95	PPM	E	CSL	53	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Dimethylphthalate	110	PPM	E	CSL	53	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Dimethylphthalate	170	PPM	E	CSL	53	PPM	TOC
73	PIER6465	HC-B01	HCB01_0_4	May-90	Pentachlorophenol	41000	PPB		SQS	360	PPB	DRY
74	PIER6465	HC-B02	HCB02_20_30	May-90	Pentachlorophenol	4900	PPB		SQS	360	PPB	DRY
73	PIER6465	HC-B01	HCB01_0_4	May-90	Pentachlorophenol	41000	PPB		CSL	690	PPB	DRY
74	PIER6465	HC-B02	HCB02_20_30	May-90	Pentachlorophenol	4900	PPB		CSL	690	PPB	DRY
PCBs												
42	MSMPNOAA	26-2-183	183	Jun-98	Total PCBs	14	PPM		SQS	12	PPM	TOC
49	P53MON92	S1	9200294	Feb-92	Total PCBs	22	PPM		SQS	12	PPM	TOC
51	P53MON92	S2	9200295	Feb-92	Total PCBs	35	PPM		SQS	12	PPM	TOC
54	P53MON92	T2	9200296	Feb-92	Total PCBs	15	PPM		SQS	12	PPM	TOC
55	P53MON92	UP1	L84-1	Nov-92	Total PCBs	19	PPM		SQS	12	PPM	TOC
56	P53MON92	UP2	L84-4	Nov-92	Total PCBs	59	PPM		SQS	12	PPM	TOC
57	P53MON92	UP3	L84-6	Nov-92	Total PCBs	15	PPM		SQS	12	PPM	TOC
65	P53MON93	P53C1	L1211-1	May-93	Total PCBs	23	PPM		SQS	12	PPM	TOC
66	P53MON93	P53C2	L1211-6DUP	May-93	Total PCBs	89	PPM		SQS	12	PPM	TOC
66	P53MON93	P53C2	L1211-6DUP	May-93	Total PCBs	89	PPM		CSL	65	PPM	TOC
73	PIER6465	HC-B01	HCB01_40_50	May-90	Total PCBs	59	PPM	E	SQS	12	PPM	TOC
74	PIER6465	HC-B02	HCB02_30_40	May-90	Total PCBs	770	PPM		SQS	12	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Total PCBs	66	PPM	E	SQS	12	PPM	TOC
76	PIER6465	HC-SS02	HCSS02_0_2	Jun-90	Total PCBs	56	PPM		SQS	12	PPM	TOC
77	PIER6465	HC-SS03	HCSS03_0_2	Jun-90	Total PCBs	44	PPM		SQS	12	PPM	TOC
74	PIER6465	HC-B02	HCB02_30_40	May-90	Total PCBs	770	PPM		CSL	65	PPM	TOC
75	PIER6465	HC-SS01	HCSS01_0_2	Jun-90	Total PCBs	66	PPM	E	CSL	65	PPM	TOC

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

Map Location	SEDQUAL Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Criteria Type	Value	Unit	Basis
Metals												
20	COLMAN94	WSF-12	WSF-12	Jul-94	Arsenic	68	PPM		SQS	57	PPM	DRY
26	COLMAN94	WSF-8	WSF-8	Jul-94	Arsenic	58	PPM	E	SQS	57	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Arsenic	97	PPM		SQS	57	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Arsenic	97	PPM		CSL	93	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Cadmium	7.1	PPM		SQS	5.1	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Cadmium	7.1	PPM		CSL	6.7	PPM	DRY
44	P53MON92	C1	9201215	May-92	Cadmium	7.8	PPM	E	SQS	5.1	PPM	DRY
45	P53MON92	C2	9201210	May-92	Cadmium	6.5	PPM	E	SQS	5.1	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Cadmium	9	PPM		SQS	5.1	PPM	DRY
44	P53MON92	C1	9201215	May-92	Cadmium	7.8	PPM	E	CSL	6.7	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Cadmium	9	PPM		CSL	6.7	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Cadmium	11	PPM		SQS	5.1	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Cadmium	16	PPM		SQS	5.1	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Cadmium	11	PPM		CSL	6.7	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Cadmium	16	PPM		CSL	6.7	PPM	DRY
66	P53MON93	P53C2	L1211-6DUP	May-93	Chromium	510	PPM		SQS	260	PPM	DRY
66	P53MON93	P53C2	L1211-6DUP	May-93	Chromium	510	PPM		CSL	270	PPM	DRY
29	COLMAN94	WSF-B	S-1	Aug-94	Copper	540	PPM		SQS	390	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Copper	410	PPM		SQS	390	PPM	DRY
29	COLMAN94	WSF-B	S-1	Aug-94	Copper	540	PPM		CSL	390	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Copper	410	PPM		CSL	390	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Copper	1000	PPM		SQS	390	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Copper	1000	PPM		CSL	390	PPM	DRY
57	P53MON92	UP3	9201267	Jun-92	Copper	2500	PPM		SQS	390	PPM	DRY
57	P53MON92	UP3	9201267	Jun-92	Copper	2500	PPM		CSL	390	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Copper	480	PPM		SQS	390	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Copper	480	PPM		CSL	390	PPM	DRY
30	COLMAN94	WSF-C	S-2	Jul-94	Lead	580	PPM		SQS	450	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Lead	750	PPM		SQS	450	PPM	DRY
30	COLMAN94	WSF-C	S-2	Jul-94	Lead	580	PPM		CSL	530	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Lead	750	PPM		CSL	530	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Lead	640	PPM		SQS	450	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Lead	640	PPM		CSL	530	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Lead	890	PPM		SQS	450	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Lead	810	PPM		SQS	450	PPM	DRY
67	P53MON93	P53C3	L1211-16	May-93	Lead	490	PPM		SQS	450	PPM	DRY
70	P53MON93	P53VG10	L1145-9	May-93	Lead	490	PPM		SQS	450	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Lead	890	PPM		CSL	530	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Lead	810	PPM		CSL	530	PPM	DRY
1	COLMAN94	CDOCK-1	WSDOT-1	Oct-93	Mercury	3.3	PPM		SQS	0.41	PPM	DRY
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Mercury	2.1	PPM		SQS	0.41	PPM	DRY
3	COLMAN94	CHM-1	CHM-1	Aug-94	Mercury	0.49	PPM		SQS	0.41	PPM	DRY
10	COLMAN94	EB-8	2-QUARTER	Jan-93	Mercury	1.2	PPM		SQS	0.41	PPM	DRY
10	COLMAN94	EB-8	1-QUARTER	Jan-93	Mercury	1.2	PPM		SQS	0.41	PPM	DRY
12	COLMAN94	VG-10	VG-10	Jul-94	Mercury	1.7	PPM		SQS	0.41	PPM	DRY
13	COLMAN94	VG-11	VG-11	Jul-94	Mercury	0.6	PPM		SQS	0.41	PPM	DRY
18	COLMAN94	WSF-10	WSF-10	Jul-94	Mercury	1.2	PPM		SQS	0.41	PPM	DRY
20	COLMAN94	WSF-12	WSF-12	Jul-94	Mercury	1.2	PPM		SQS	0.41	PPM	DRY
21	COLMAN94	WSF-13	WSF-13	Jul-94	Mercury	0.9	PPM		SQS	0.41	PPM	DRY
26	COLMAN94	WSF-8	WSF-8	Jul-94	Mercury	1.6	PPM		SQS	0.41	PPM	DRY
27	COLMAN94	WSF-9	WSF-9	Jul-94	Mercury	1.3	PPM		SQS	0.41	PPM	DRY
29	COLMAN94	WSF-B	S-1	Aug-94	Mercury	18	PPM		SQS	0.41	PPM	DRY
30	COLMAN94	WSF-C	S-2	Jul-94	Mercury	4.9	PPM		SQS	0.41	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Mercury	3.1	PPM		SQS	0.41	PPM	DRY
30	COLMAN94	WSF-C	S-1	Jul-94	Mercury	1.4	PPM		SQS	0.41	PPM	DRY
31	COLMAN94	WSF-D	S-2	Jul-94	Mercury	1.4	PPM		SQS	0.41	PPM	DRY
31	COLMAN94	WSF-D	S-1.5	Jul-94	Mercury	0.6	PPM		SQS	0.41	PPM	DRY
31	COLMAN94	WSF-D	S-1	Jul-94	Mercury	0.5	PPM		SQS	0.41	PPM	DRY
32	COLMAN94	WSF-E	S-2	Jul-94	Mercury	1	PPM		SQS	0.41	PPM	DRY
32	COLMAN94	WSF-E	S-1	Jul-94	Mercury	0.8	PPM		SQS	0.41	PPM	DRY
1	COLMAN94	CDOCK-1	WSDOT-1	Oct-93	Mercury	3.3	PPM		CSL	0.59	PPM	DRY
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Mercury	2.1	PPM		CSL	0.59	PPM	DRY
10	COLMAN94	EB-8	2-QUARTER	Jan-93	Mercury	1.2	PPM		CSL	0.59	PPM	DRY
10	COLMAN94	EB-8	1-QUARTER	Jan-93	Mercury	1.2	PPM		CSL	0.59	PPM	DRY
12	COLMAN94	VG-10	VG-10	Jul-94	Mercury	1.7	PPM		CSL	0.59	PPM	DRY

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
13	COLMAN94	VG-11	VG-11	Jul-94	Mercury	0.6	PPM		CSL	0.59	PPM	DRY
18	COLMAN94	WSF-10	WSF-10	Jul-94	Mercury	1.2	PPM		CSL	0.59	PPM	DRY
20	COLMAN94	WSF-12	WSF-12	Jul-94	Mercury	1.2	PPM		CSL	0.59	PPM	DRY
21	COLMAN94	WSF-13	WSF-13	Jul-94	Mercury	0.9	PPM		CSL	0.59	PPM	DRY
26	COLMAN94	WSF-8	WSF-8	Jul-94	Mercury	1.6	PPM		CSL	0.59	PPM	DRY
27	COLMAN94	WSF-9	WSF-9	Jul-94	Mercury	1.3	PPM		CSL	0.59	PPM	DRY
29	COLMAN94	WSF-B	S-1	Aug-94	Mercury	18	PPM		CSL	0.59	PPM	DRY
30	COLMAN94	WSF-C	S-2	Jul-94	Mercury	4.9	PPM		CSL	0.59	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Mercury	3.1	PPM		CSL	0.59	PPM	DRY
30	COLMAN94	WSF-C	S-1	Jul-94	Mercury	1.4	PPM		CSL	0.59	PPM	DRY
31	COLMAN94	WSF-D	S-2	Jul-94	Mercury	1.4	PPM		CSL	0.59	PPM	DRY
31	COLMAN94	WSF-D	S-1.5	Jul-94	Mercury	0.6	PPM		CSL	0.59	PPM	DRY
32	COLMAN94	WSF-E	S-2	Jul-94	Mercury	1	PPM		CSL	0.59	PPM	DRY
32	COLMAN94	WSF-E	S-1	Jul-94	Mercury	0.8	PPM		CSL	0.59	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Mercury	0.9	PPM	E	SQS	0.41	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Mercury	0.9	PPM	E	CSL	0.59	PPM	DRY
79	HSSEAT88	LTFH02	8801132	May-88	Mercury	0.49	PPM	E	SQS	0.41	PPM	DRY
80	HSSEAT88	LTFH03	8801133	May-88	Mercury	3.3	PPM	E	SQS	0.41	PPM	DRY
81	HSSEAT88	LTFH04	8801134	May-88	Mercury	0.56	PPM	E	SQS	0.41	PPM	DRY
80	HSSEAT88	LTFH03	8801133	May-88	Mercury	3.3	PPM	E	CSL	0.59	PPM	DRY
44	P53MON92	C1	9201215	May-92	Mercury	3.1	PPM	E	SQS	0.41	PPM	DRY
45	P53MON92	C2	9201210	May-92	Mercury	4.8	PPM	E	SQS	0.41	PPM	DRY
46	P53MON92	C3	9201220	May-92	Mercury	2.7	PPM	E	SQS	0.41	PPM	DRY
47	P53MON92	C4	9201225	May-92	Mercury	1.5	PPM	E	SQS	0.41	PPM	DRY
47	P53MON92	C4	9201224	May-92	Mercury	3	PPM	E	SQS	0.41	PPM	DRY
48	P53MON92	C5	9201227	May-92	Mercury	1.2	PPM	E	SQS	0.41	PPM	DRY
64	P53MON92	P53VG8	9201123	May-92	Mercury	0.54	PPM		SQS	0.41	PPM	DRY
49	P53MON92	S1	9200294	Feb-92	Mercury	1.9	PPM	EL	SQS	0.41	PPM	DRY
50	P53MON92	S11	9200297	Feb-92	Mercury	1.8	PPM	EL	SQS	0.41	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Mercury	2.6	PPM	EL	SQS	0.41	PPM	DRY
52	P53MON92	S9	9200299	Feb-92	Mercury	2.1	PPM	EL	SQS	0.41	PPM	DRY
53	P53MON92	T1	9200298	Feb-92	Mercury	2.3	PPM	EL	SQS	0.41	PPM	DRY
54	P53MON92	T2	9200296	Feb-92	Mercury	3.8	PPM	EL	SQS	0.41	PPM	DRY
55	P53MON92	UP1	9201264	Jun-92	Mercury	0.5	PPM		SQS	0.41	PPM	DRY
56	P53MON92	UP2	L84-7	Nov-92	Mercury	1.1	PPM		SQS	0.41	PPM	DRY
56	P53MON92	UP2	L84-4	Nov-92	Mercury	0.85	PPM		SQS	0.41	PPM	DRY
56	P53MON92	UP2	L84-3	Nov-92	Mercury	1	PPM		SQS	0.41	PPM	DRY
56	P53MON92	UP2	9201266	Jun-92	Mercury	0.62	PPM	G	SQS	0.41	PPM	DRY
57	P53MON92	UP3	L84-6	Nov-92	Mercury	2.4	PPM		SQS	0.41	PPM	DRY
58	P53MON92	UP4	L84-5	Nov-92	Mercury	2.6	PPM		SQS	0.41	PPM	DRY
44	P53MON92	C1	9201215	May-92	Mercury	3.1	PPM	E	CSL	0.59	PPM	DRY
45	P53MON92	C2	9201210	May-92	Mercury	4.8	PPM	E	CSL	0.59	PPM	DRY
46	P53MON92	C3	9201220	May-92	Mercury	2.7	PPM	E	CSL	0.59	PPM	DRY
47	P53MON92	C4	9201225	May-92	Mercury	1.5	PPM	E	CSL	0.59	PPM	DRY
47	P53MON92	C4	9201224	May-92	Mercury	3	PPM	E	CSL	0.59	PPM	DRY
48	P53MON92	C5	9201227	May-92	Mercury	1.2	PPM	E	CSL	0.59	PPM	DRY
49	P53MON92	S1	9200294	Feb-92	Mercury	1.9	PPM	EL	CSL	0.59	PPM	DRY
50	P53MON92	S11	9200297	Feb-92	Mercury	1.8	PPM	EL	CSL	0.59	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Mercury	2.6	PPM	EL	CSL	0.59	PPM	DRY
52	P53MON92	S9	9200299	Feb-92	Mercury	2.1	PPM	EL	CSL	0.59	PPM	DRY
53	P53MON92	T1	9200298	Feb-92	Mercury	2.3	PPM	EL	CSL	0.59	PPM	DRY
54	P53MON92	T2	9200296	Feb-92	Mercury	3.8	PPM	EL	CSL	0.59	PPM	DRY
56	P53MON92	UP2	L84-7	Nov-92	Mercury	1.1	PPM		CSL	0.59	PPM	DRY
56	P53MON92	UP2	L84-4	Nov-92	Mercury	0.85	PPM		CSL	0.59	PPM	DRY
56	P53MON92	UP2	L84-3	Nov-92	Mercury	1	PPM		CSL	0.59	PPM	DRY
56	P53MON92	UP2	9201266	Jun-92	Mercury	0.62	PPM	G	CSL	0.59	PPM	DRY
57	P53MON92	UP3	L84-6	Nov-92	Mercury	2.4	PPM		CSL	0.59	PPM	DRY
58	P53MON92	UP4	L84-5	Nov-92	Mercury	2.6	PPM		CSL	0.59	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Mercury	2.9	PPM	G	SQS	0.41	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Mercury	6.9	PPM	G	SQS	0.41	PPM	DRY
67	P53MON93	P53C3	L1211-16	May-93	Mercury	2.9	PPM	G	SQS	0.41	PPM	DRY
68	P53MON93	P53C4	L1211-21	May-93	Mercury	1.9	PPM	E	SQS	0.41	PPM	DRY
69	P53MON93	P53C5	L1211-26	May-93	Mercury	0.86	PPM	E	SQS	0.41	PPM	DRY
70	P53MON93	P53VG10	L1145-9	May-93	Mercury	1.4	PPM	E	SQS	0.41	PPM	DRY
71	P53MON93	P53VG11	L1145-10	May-93	Mercury	1.4	PPM	E	SQS	0.41	PPM	DRY
63	P53MON93	P53VG5	L1145-6	May-93	Mercury	0.65	PPM	E	SQS	0.41	PPM	DRY

Exhibit B-13. Sediment Concentrations that Exceeded SMS CSL Criteria from Sample Sites in the Vicinity of Elliott Bay

	SEDQUAL								Criteria			
Map Location	Survey	Station	Sample	Date	Analyte	Value	Units	Qualifier	Type	Value	Unit	Basis
65	P53MON93	P53C1	L1211-1	May-93	Mercury	2.9	PPM	G	CSL	0.59	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Mercury	6.9	PPM	G	CSL	0.59	PPM	DRY
67	P53MON93	P53C3	L1211-16	May-93	Mercury	2.9	PPM	G	CSL	0.59	PPM	DRY
68	P53MON93	P53C4	L1211-21	May-93	Mercury	1.9	PPM	E	CSL	0.59	PPM	DRY
69	P53MON93	P53C5	L1211-26	May-93	Mercury	0.86	PPM	E	CSL	0.59	PPM	DRY
70	P53MON93	P53VG10	L1145-9	May-93	Mercury	1.4	PPM	E	CSL	0.59	PPM	DRY
71	P53MON93	P53VG11	L1145-10	May-93	Mercury	1.4	PPM	E	CSL	0.59	PPM	DRY
63	P53MON93	P53VG5	L1145-6	May-93	Mercury	0.65	PPM	E	CSL	0.59	PPM	DRY
1	COLMAN94	CDOCK-1	WSDOT-1	Oct-93	Silver	7	PPM		SQS	6.1	PPM	DRY
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Silver	6.7	PPM		SQS	6.1	PPM	DRY
1	COLMAN94	CDOCK-1	WSDOT-1	Oct-93	Silver	7	PPM		CSL	6.1	PPM	DRY
2	COLMAN94	CDOCK-2	WSDOT-2	Oct-93	Silver	6.7	PPM		CSL	6.1	PPM	DRY
38	DENN9496	LTBD22	L3992-1	Jun-94	Silver	15	PPM		SQS	6.1	PPM	DRY
38	DENN9496	LTBD22	L3992-1	Jun-94	Silver	15	PPM		CSL	6.1	PPM	DRY
40	HSDENN92	LTBD25	9201379	Jul-92	Silver	11	PPM		SQS	6.1	PPM	DRY
40	HSDENN92	LTBD25	9201379	Jul-92	Silver	11	PPM		CSL	6.1	PPM	DRY
44	P53MON92	C1	9201215	May-92	Silver	12	PPM	G	SQS	6.1	PPM	DRY
45	P53MON92	C2	9201210	May-92	Silver	14	PPM	G	SQS	6.1	PPM	DRY
49	P53MON92	S1	9200294	Feb-92	Silver	7.7	PPM	E	SQS	6.1	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Silver	10	PPM	E	SQS	6.1	PPM	DRY
52	P53MON92	S9	9200299	Feb-92	Silver	7.7	PPM	E	SQS	6.1	PPM	DRY
58	P53MON92	UP4	L84-5	Nov-92	Silver	6.3	PPM	G	SQS	6.1	PPM	DRY
44	P53MON92	C1	9201215	May-92	Silver	12	PPM	G	CSL	6.1	PPM	DRY
45	P53MON92	C2	9201210	May-92	Silver	14	PPM	G	CSL	6.1	PPM	DRY
49	P53MON92	S1	9200294	Feb-92	Silver	7.7	PPM	E	CSL	6.1	PPM	DRY
51	P53MON92	S2	9200295	Feb-92	Silver	10	PPM	E	CSL	6.1	PPM	DRY
52	P53MON92	S9	9200299	Feb-92	Silver	7.7	PPM	E	CSL	6.1	PPM	DRY
58	P53MON92	UP4	L84-5	Nov-92	Silver	6.3	PPM	G	CSL	6.1	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Silver	22	PPM		SQS	6.1	PPM	DRY
66	P53MON93	P53C2	L1211-6DUP	May-93	Silver	140	PPM		SQS	6.1	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Silver	52	PPM		SQS	6.1	PPM	DRY
67	P53MON93	P53C3	L1211-16	May-93	Silver	13	PPM		SQS	6.1	PPM	DRY
70	P53MON93	P53VG10	L1145-9	May-93	Silver	10	PPM		SQS	6.1	PPM	DRY
71	P53MON93	P53VG11	L1145-10	May-93	Silver	6.2	PPM		SQS	6.1	PPM	DRY
65	P53MON93	P53C1	L1211-1	May-93	Silver	22	PPM		CSL	6.1	PPM	DRY
66	P53MON93	P53C2	L1211-6DUP	May-93	Silver	140	PPM		CSL	6.1	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Silver	52	PPM		CSL	6.1	PPM	DRY
67	P53MON93	P53C3	L1211-16	May-93	Silver	13	PPM		CSL	6.1	PPM	DRY
70	P53MON93	P53VG10	L1145-9	May-93	Silver	10	PPM		CSL	6.1	PPM	DRY
71	P53MON93	P53VG11	L1145-10	May-93	Silver	6.2	PPM		CSL	6.1	PPM	DRY
26	COLMAN94	WSF-8	WSF-8	Jul-94	Zinc	480	PPM		SQS	410	PPM	DRY
30	COLMAN94	WSF-C	S-4	Jul-94	Zinc	490	PPM		SQS	410	PPM	DRY
30	COLMAN94	WSF-C	S-1.5	Jul-94	Zinc	750	PPM		SQS	410	PPM	DRY
30	COLMAN94	WSF-C	S-1	Jul-94	Zinc	870	PPM		SQS	410	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Zinc	4800	PPM	E	SQS	410	PPM	DRY
78	EBCHEM	SS-03	SS-03	Oct-85	Zinc	4800	PPM	E	CSL	960	PPM	DRY
44	P53MON92	C1	9201215	May-92	Zinc	440	PPM	G	SQS	410	PPM	DRY
66	P53MON93	P53C2	L1211-6	May-93	Zinc	670	PPM		SQS	410	PPM	DRY

Source: SEDQUAL Release 5 (2004) SMS Exceedances - Elliot Bay (3/6/2007)

SURVEY	REFERENCE CD	SOURCE	SEDQUAL REFERENCE
COLMAN94	HARTC0006	Hart Crowser, Inc.	Sediment Quality Assessment - Seattle Ferry Terminal - Colman Dock - South Area - Seattle, Washington. J-4134 October 31, 1994
CONCSO95	KING0004	King County	NPDES Connecticut CSO Baseline Study, 1995
DENN9496	KING0023	King County	"Denny Way Sediment Cap 1994 Data", Final Report, Wilson and Romberg, May 1996
EBCHEM	EPA0014	EPA Region 10	Puget Sound Estuary Program Elliott Bay Action Program: Evaluation of Potential Contaminant Sources TC-3338-23 Final Report, Sept. 1988. Prepared by Tetra Tech, Inc. for U.S. EPA Region X
HSDENN92	METRO0007	Metropolitan Seattle	METRO's Hot Spot. Denny Way Subtidal, '92
HSSEAT88	METRO0008	Metropolitan Seattle	METRO's Hot Spot Investigation. Waterfront, '88
HSSEAT89	METRO0009	Metropolitan Seattle	METRO's Hot Spot Investigation. Waterfront, '89
HSSEAT90	METRO0010	Metropolitan Seattle	METRO's Hot Spot Investigation. Waterfront, '90
MSMPNOAA	PSAMP_1	PSAMP/NOAA	Puget Sound Ambient Monitoring Program Marine Sediment Monitoring Component - Final Quality Assurance Project and Implementation Plan. Measures of bioeffects associated with toxicants in Puget Sound. 1998
P53MON92	METRO0024	Metropolitan Seattle	Pier 53-55: Sediment Cap and Enhanced Natural Recovery Area Remediation Project. 1993
P53MON93	METRO0028	Metropolitan Seattle	METRO Environmental Lab Analytical Report and QA Review Report for Pier 53-55 sediment sampling, May 1993
PIER6465	POS003	Port of Seattle	Pier 64/65 Sediment Quality Assessment. 1990

Exhibit B-14. Sediment Concentrations in Samples Collected from the Project Area in November 2006 (legend is on the last page)

ANALYTE	UNITS	SQS	SIZM SCSL	AWV1-112206 SAMPLE RESULT	PMX QUALIFIER	AWV2-112206 SAMPLE RESULT	PMX QUALIFIER	AWV3-112206 SAMPLE RESULT	PMX QUALIFIER	AWV4-112206 SAMPLE RESULT	PMX QUALIFIER	AWV5-112206 SAMPLE RESULT	PMX QUALIFIER	AWV6-112206 SAMPLE RESULT	PMX QUALIFIER
Total Organic Carbon	%	- - -	- - -	6.63		3.39		3.28		3.16		2.28		3.65	
Metals															
Antimony	mg/kg dw	- - -	- - -	20	UJ-	8	UJ-	20	UJ-	7	UJ-	7	UJ-	10	UJ-
Arsenic	mg/kg dw	57	93	40		16		20		7		7		10	
Cadmium	mg/kg dw	5.1	6.7	3.4		1.2		1		0.3		0.3		0.4	
Chromium	mg/kg dw	260	270	55		28.1		28		16.4		23.7		22	
Copper	mg/kg dw	390	390	165		72.5		59		28		44.3		35.2	
Lead	mg/kg dw	450	530	221		133		90		14		17		20	
Mercury	mg/kg dw	0.41	0.59	0.9		1.24		0.37		0.08		0.1		0.13	
Molybdenum	mg/kg dw	- - -	- - -	10		2.8		6		0.7		0.7		3	
Nickel	mg/kg dw	- - -	- - -	35		29		21		16		24		19	
Selenium	mg/kg dw	- - -	- - -	3		0.4		0.4		0.3		0.3		0.4	
Silver	mg/kg dw	6.1	6.1	2.8		1.2		1		0.4		0.4		0.6	
Zinc	mg/kg dw	410	960	499		244		129		84.6		73.6		84	
SVOC															
Naphthalene	mg/kg oc	99	170	8.4		15		6.1		0.66		0.96		0.52	
Acenaphthylene	mg/kg oc	66	66	8.6		2.9		9.8		0.54		1.1		0.77	
Acenaphthene	mg/kg oc	16	57	6.3		14		14		3.8		1.8		0.55	
Anthracene	mg/kg oc	23	79	54		15		21		0.73		2.4		0.85	
Fluorene	mg/kg oc	100	480	11		103		107		3.8		14		4.7	
Phenanthrene	mg/kg oc	220	1200	66		35		125		3.5		7.9		3.8	
2-Methylnaphthalene	mg/kg oc	38	64	5.6		6.8		5.8		0.63		0.88		0.55	
Total LPAHs	mg/kg oc	370	780	154		185		**283**		**13**		**28**		**11**	
Fluoranthene	mg/kg oc	160	1200	136		112		265		9.5		20		14	
Pyrene	mg/kg oc	1000	1400	196		133		189		9.5		20		13	
Benzo(a)anthracene	mg/kg oc	110	270	60		50		128		4.1		12		6.8	
Chrysene	mg/kg oc	110	460	166		56		220		7.6		18		12	
Benzo(b)fluoranthene	*mg/kg oc*	- - -	- - -	*124*		*62*		*183*		*10.8*		*17*		*10.7*	
Benzo(k)fluoranthene	*mg/kg oc*	- - -	- - -	*151*		*47*		*119*		*5.7*		*26*		*17*	
Total Benzofluoranthenes	mg/kg oc	230	450	275		109		**302**		**16.5**		**43**		**28**	
Benzo(a)pyrene	mg/kg oc	99	210	136		59		149		6.6		17		10.1	
Indeno(1,2,3-cd)pyrene	mg/kg oc	34	88	29		15		37		1.7		4.4		2.7	
Dibenz(a,h)anthracene	mg/kg oc	12	33	15		8.3		20		0.82		2.5		1.2	
Benzo(g,h,i)perylene	mg/kg oc	31	78	24		14		30		1.6		4.1		2.5	
Total HPAHs	mg/kg oc	960	5300	1037		556		**1340**		**58**		**141**		**90**	
1,2-Dichlorobenzene	mg/kg oc	2.3	2.3	0.90		2.1		1.8		0.63		0.88		0.55	
1,3-Dichlorobenzene	mg/kg oc	- - -	- - -	0.90		2.1		1.8		0.63		0.88		0.55	
1,4-Dichlorobenzene	mg/kg oc	3.1	9	0.90		2.1		1.8		0.63		0.88		0.55	
1,2,4-Trichlorobenzene	mg/kg oc	0.81	1.8	0.90		2.1		1.8		0.63		0.88		0.55	
Hexachlorobenzene	mg/kg oc	0.38	2.3	0.15		0.14		0.15		0.06		0.09		0.05	
Dimethylphthalate	mg/kg oc	53	53	0.90		2.1		1.8		0.63		0.88		0.55	
Diethylphthalate	mg/kg oc	61	110	0.90		2.1		1.8		0.63		0.88		0.55	
Di-n-Butylphthalate	mg/kg oc	220	1700	1.2		2.1		1.8		0.63		0.88		0.55	
Butylbenzylphthalate	mg/kg oc	4.9	64	0.90		2.1		1.8		0.63		0.88		0.30	
bis(2-Ethylhexyl)phthalate	mg/kg oc	47	78	17		11		8.5		2.5		4.1		4.7	
Di-n-Octyl phthalate	mg/kg oc	58	4500	0.90		2.1		1.8		0.63		0.88		0.55	

Exhibit B-14. Sediment Concentrations in Samples Collected from the Project Area in November 2006 (legend is on the last page)

ANALYTE	UNITS	SQS	SIZM SCSL	AWV1-112206 SAMPLE RESULT	PMX QUALIFIER	AWV2-112206 SAMPLE RESULT	PMX QUALIFIER	AWV3-112206 SAMPLE RESULT	PMX QUALIFIER	AWV4-112206 SAMPLE RESULT	PMX QUALIFIER	AWV5-112206 SAMPLE RESULT	PMX QUALIFIER	AWV6-112206 SAMPLE RESULT	PMX QUALIFIER
Dibenzofuran	mg/kg oc	15	58	6.2		10		8.5		0.66		1.4		0.49	
Hexachlorobutadiene	mg/kg oc	3.9	6.2	0.15		0.14		0.15		0.63		0.09		0.05	
Hexachloroethane	mg/kg oc	- - -	- - -	0.90		2.1		1.8		0.63		0.88			
N-Nitrosodiphenylamine	mg/kg oc	11	11	0.90		2.1		1.8		0.63		0.88		0.55	
Phenol	ug/kg dw	420	1200	60		72		59		36	UB	20		260	
2-Methylphenol	ug/kg dw	63	63	60		72		59		20		98		99	
4-Methylphenol	ug/kg dw	670	670	110		72		79		28		20		20	
2,4-Dimethylphenol	ug/kg dw	29	29	47		88		59		20		20		180	
Pentachlorophenol	ug/kg dw	360	690	300		720		300		98		20		20	
Benzyl Alcohol	ug/kg dw	57	73	60		72		59		20		20		20	
Benzoic Acid	ug/kg dw	650	650	600		360		590		200		200		200	
Aldrin	ug/kg dw	- - -	- - -	9.9		4.9		4.9		1.9		2		2	
alpha Chlordane	ug/kg dw	- - -	- - -	9.9		4.9		4.9		1.9		2		2	
gamma Chlordane	ug/kg dw	- - -	- - -	16	UY	4.9		4.9		1.9		2		2	
Dieldrin	ug/kg dw	- - -	- - -	20		9.7		9.9		3.9		3.9		3.9	
Heptachlor	ug/kg dw	- - -	- - -	9.9		4.9		4.9		1.9		2		2	
gamma-BHC (Lindane)	ug/kg dw	- - -	- - -	9.9		4.9		4.9		1.9		2		2	
4,4'-DDE	ug/kg dw	- - -	- - -	20		9.7		*9.9*		*3.9*		*3.9*		*3.9*	
4,4'-DDD	ug/kg dw	- - -	- - -	20		9.7		*9.9*		*3.9*		*3.9*		*3.9*	
4,4'-DDT	ug/kg dw	- - -	- - -	20		9.7		21	UY	*3.9*		7.4	UY	11	UY
Total DDT	ug/kg dw	- - -	- - -	20		9.7		21		3.9		**7.4**		**11**	
Aroclor 1016	mg/kg oc	- - -	- - -	0.24		0.47		0.49		0.51		0.7		0.44	
Aroclor 1221	mg/kg oc	- - -	- - -	0.24		0.47		0.49		0.51		0.7		0.44	
Aroclor 1232	mg/kg oc	- - -	- - -	0.24		0.47		0.49		0.51		0.7		0.44	
Aroclor 1242	mg/kg oc	- - -	- - -	0.24		0.47		0.49		0.51		0.7		0.44	
Aroclor 1248	mg/kg oc	- - -	- - -	4.2		0.47		0.95	UY	0.51		0.7		0.44	
Aroclor 1254	mg/kg oc	- - -	- - -	8.6		1		10.4		0.41		0.79		0.66	
Aroclor 1260	mg/kg oc	- - -	- - -	5.3		1.4		3.4		0.47		0.96		0.77	
Total PCBs	mg/kg oc	12	65	18		2.4		13.8		0.51		**0.96**		**1.4**	
Gravel	%	- - -	- - -	13.4		35		56		1.0		3.9		1.8	
Very Coarse Sand	%	- - -	- - -	8.1		7.4		6.6		4.7		7.9		4.9	
Coarse Sand	%	- - -	- - -	6.8		10.2		4.9		22.3		24.6		15.1	
Medium Sand	%	- - -	- - -	6.1		16		8.9		42.5		34.5		27.6	
Fine Sand	%	- - -	- - -	5.2		14.7		5		14.9		10.5		18.5	
Very Fine Sand	%	- - -	- - -	5.8		2.9		4.3		3.1		3.7		6.6	
Coarse Silt	%	- - -	- - -	11.3		2		2.8		1.2		2.4		3.1	
Medium Silt	%	- - -	- - -	15.6		3.3		6		1.5		2.1		4.9	
Fine Silt	%	- - -	- - -	6.9		2		1.2		1.3		2		5.1	
Very Fine Silt	%	- - -	- - -	4.2		1.6		0.6		1.7		2		3.5	
8-9 Phi Clay	%	- - -	- - -	3.3		1.2		0.1		1.4		1.5		1.7	
9-10 Phi Clay	%	- - -	- - -	3.2		1		0.8		1.6		1.7		2.5	
> 10 Phi Clay	%	- - -	- - -	10.1		2.7		2.9		2.8		3.2		4.8	
Total Fines	%	- - -	- - -	54.5		13.9		14.3		11.5		14.9		25.5	

Exhibit B-14. Sediment Concentrations in Samples Collected from the Project Area in November 2006 (legend is on the last page)

ANALYTE	AWV7-112206 SAMPLE RESULT	PMX QUALIFIER	AWV8-112006 SAMPLE RESULT	PMX QUALIFIER	AWV9-112006 SAMPLE RESULT	PMX QUALIFIER	AWV10-112206 SAMPLE RESULT	PMX QUALIFIER	AWV11-112006 SAMPLE RESULT	PMX QUALIFIER	AWV12-112006 SAMPLE RESULT	PMX QUALIFIER	AWV13-112006 SAMPLE RESULT	PMX QUALIFIER
Total Organic Carbon	3.2		5.26		8.75		5.16		6.54		5.61		6.69	
Metals														
Antimony	10	UJ-	10	UJ-	10	UJ-	10	UJ-	10	UJ-	10	UJ-	20	UJ-
Arsenic	10		20		20		40		40		50		20	
Cadmium	0.5		3.1		1.8		3.9		5.3		2.1		2.2	
Chromium	33		83		68		78		89		56		54	
Copper	68.7		127		179		237		302		226		160	
Lead	56		201		192		235		315		228		161	
Mercury	0.35		1.08		1.5		2.4		2		1.1		1.1	
Molybdenum	2		6		6		11		15		5		7	
Nickel	27		28		33		45		42		31		32	
Selenium	0.4		0.9		2		1		4		0.8		1	
Silver	0.7		5.5		5.1		8.3		8.2		5.6		4.8	
Zinc	126		304		313		503		532		270		265	
SVOC														
Naphthalene	2.4		15		5.6		4.1		4.0		9.4		2.2	
Acenaphthylene	4.7		23		11		7.6		4.7		5.7		3.0	
Acenaphthene	2.3		6.8		16		3.5		3.1		7.1		1.4	
Anthracene	3.4		21		29		5.8		3.8		6.8		2.4	
Fluorene	21		228		160		23		20		45		13	
Phenanthrene	21		57		43		23		24		36		24	
2-Methylnaphthalene	1.9		7.2		3.0		2.1		2.0		3.9		0.96	
Total LPAHs	**55**		**351**		**265**		**67**		**60**		**110**		**46**	
Fluoranthene	103		361		137		70		35		68		42	
Pyrene	103		285		149		89		118		125		37	
Benzo(a)anthracene	56		116		55		33		24		37		27	
Chrysene	81		209		94		60		47		70		43	
Benzo(b)fluoranthene	*72*		*163*		*110*		*101*		*83*		*75*		*43*	
Benzo(k)fluoranthene	*134*		*228*		*77*		*79*		*98*		*80*		*39*	
Total Benzofluoranthenes	**206**		391		187		**180**		181		**155**		**82**	
Benzo(a)pyrene	75		186		105		70		80		75		37	
Indeno(1,2,3-cd)pyrene	19		55		29		15		17		17		13	
Dibenz(a,h)anthracene	10.9		25		14		4.5		9.5		9.6		6.6	
Benzo(g,h,i)perylene	17		49		25		11		14		17		12	
Total HPAHs	**671**		**1677**		**795**		**533**		**526**		**574**		**300**	
1,2-Dichlorobenzene	1.9		1.1		0.69		1.9		0.92		1.1		0.90	
1,3-Dichlorobenzene	1.9		1.1		0.69		1.9		0.92		1.1		0.90	
1,4-Dichlorobenzene	1.9		1.1		0.69		1.6		0.84		0.66		0.90	
1,2,4-Trichlorobenzene	1.9		1.1		0.69		1.9		0.92		1.1		0.90	
Hexachlorobenzene	0.16		0.19		0.11		0.1		0.15		0.17		0.07	
Dimethylphthalate	1.9		0.76		0.69		1.6		0.64		1.1		0.90	
Diethylphthalate	1.9		1.1		0.69		1.9		0.57		1.1		0.90	
Di-n-Butylphthalate	1.9		0.65		0.37		1.8		1.1		0.77		0.90	
Butylbenzylphthalate	1.9		1.1		2.1		2.1		2.0		1.1		0.90	
bis(2-Ethylhexyl)phthalate	6.6		30		14		37		34		25		8.1	
Di-n-Octyl phthalate	1.9		1.1		0.69		1.9		0.92		1.1		0.90	

Exhibit B-14. Sediment Concentrations in Samples Collected from the Project Area in November 2006 (legend is on the last page)

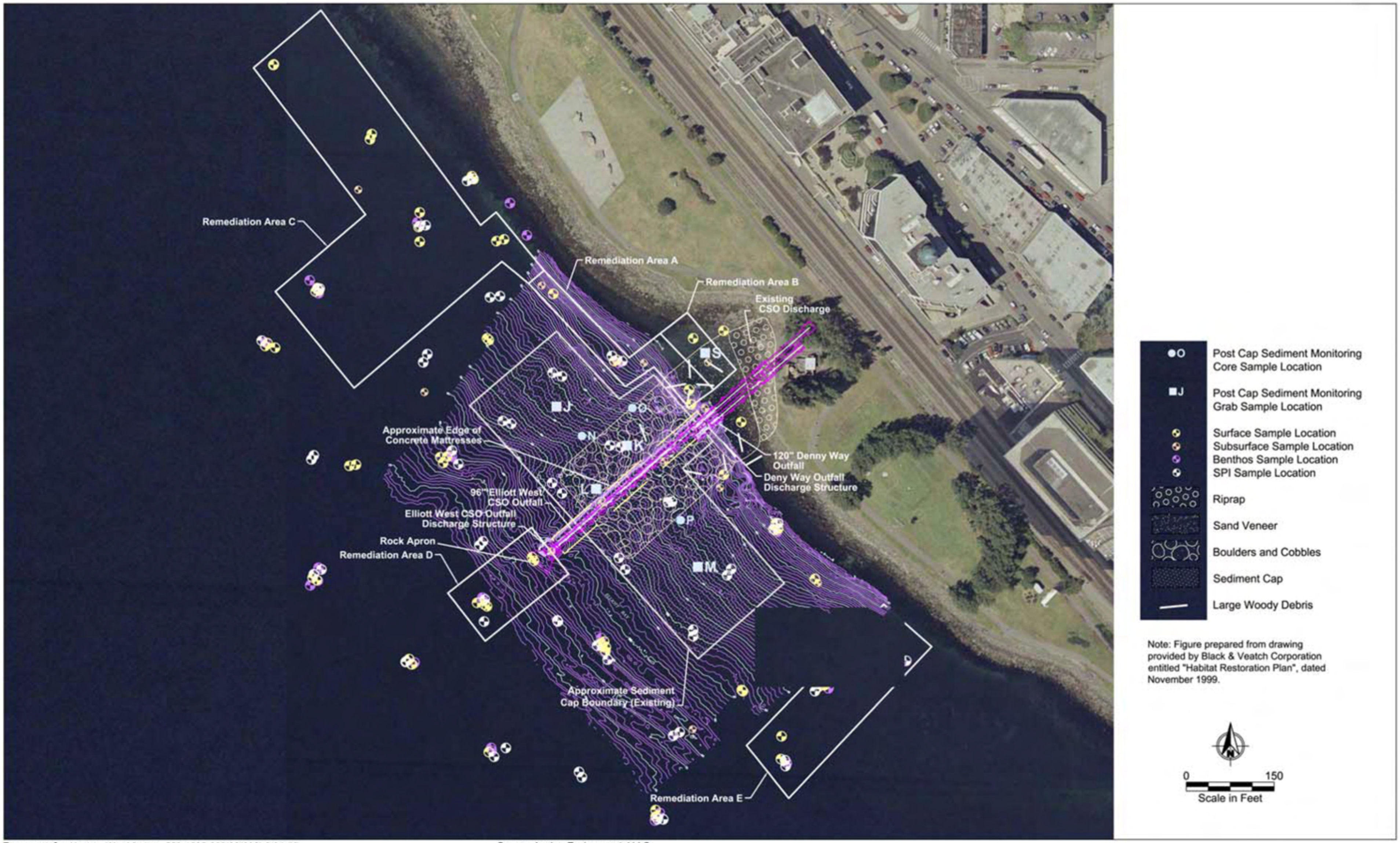
ANALYTE	AWV7-112206 SAMPLE RESULT	PMX QUALIFIER	AWV8-112006 SAMPLE RESULT	PMX QUALIFIER	AWV9-112006 SAMPLE RESULT	PMX QUALIFIER	AWV10-112206 SAMPLE RESULT	PMX QUALIFIER	AWV11-112006 SAMPLE RESULT	PMX QUALIFIER	AWV12-112006 SAMPLE RESULT	PMX QUALIFIER	AWV13-112006 SAMPLE RESULT	PMX QUALIFIER
Dibenzofuran	2.1		17		9.4		3.7		3.5		6.1		1.5	
Hexachlorobutadiene	0.16		0.19		0.11		0.1		0.15		0.17		0.07	
Hexachloroethane	1.9		1.1		0.69		1.9		0.92		1.1		0.90	
N-Nitrosodiphenylamine	1.9		3.8		0.69		1.9		0.92		1.1		0.90	
Phenol	60		78	UB	60		100		60		59		60	
2-Methylphenol	300		59		60		500		60		59		60	
4-Methylphenol	60		110		69		100		50		61		32	
2,4-Dimethylphenol	60		59		60		100		60		59		60	
Pentachlorophenol	60		300		300		100		300		300		300	
Benzyl Alcohol	60		59		60		100		60		59		60	
Benzoic Acid	600		590		600		1000		600		590		600	
Aldrin	5		9.8		9.9		5.0		9.8		9.8		4.9	
alpha Chlordane	5		9.8		9.9		9.0	UY	49		9.8		4.9	
gamma Chlordane	5		50	UY	9.9		21	UY	100		9.8		4.9	
Dieldrin	9.9		20		20		9.9		64	UY	20		9.9	
Heptachlor	5		9.8		9.9		5.0		9.8		9.8		4.9	
gamma-BHC (Lindane)	5		9.8		9.9		5.0		9.8		9.8		4.9	
4,4'-DDE	*9.9*		33	UY	37		37	UY	310		*65*		*9.9*	
4,4'-DDD	*9.9*		20		20		*9.9*		20		*20*		*9.9*	
4,4'-DDT	*9.9*		150	UY	120	UY	54	UY	20		110	UY	20	UY
Total DDT	**9.9**		150		37		**54**		310		**65**		**20**	
Aroclor 1016	0.50		0.30		0.18		0.31		0.24		0.29		0.24	
Aroclor 1221	0.50		0.30		0.18		0.31		0.24		0.29		0.24	
Aroclor 1232	0.50		0.30		0.18		0.31		0.24		0.29		0.24	
Aroclor 1242	0.50		0.30		0.18		0.31		0.24		0.29		0.24	
Aroclor 1248	0.50		13		2.7		6.0		6.4		2.9	UY	0.48	
Aroclor 1254	1.7		32		8.6		11		14		14		1.5	
Aroclor 1260	2.4		19		9.9		12		11		11		2.4	
Total PCBs	**4.1**		64		21		**29**		31		**25**		**4.4**	
Gravel	1.7		28.3		9.3		1.8		1.2		15		3.4	
Very Coarse Sand	4.6		11.3		11.4		11.6		8.3		5.9		12.2	
Coarse Sand	15.5		7.3		8.6		8.8		6.8		6.5		6.5	
Medium Sand	25.3		6.3		8.9		11.9		7.7		10.5		6.1	
Fine Sand	9.1		5.8		4.7		6.1		6		11.9		4.7	
Very Fine Sand	4.3		5.3		4.8		5.8		5.4		9.8		4.8	
Coarse Silt	5.1		3.1		3.5		3.7		4.4		10.8		9.5	
Medium Silt	7.6		9.5		9.6		14.4		14.2		9.2		23.7	
Fine Silt	5.4		6.6		8.9		10.2		10.6		5.7		9.2	
Very Fine Silt	5.6		4		8.5		5		8.6		2.9		4.3	
8-9 Phi Clay	3.5		2.5		5.9		4.3		6.1		2.2		3.2	
9-10 Phi Clay	4.5		2.8		5.2		5.2		6.9		2.7		2.6	
> 10 Phi Clay	7.7		7.1		10.7		11.4		14.1		7		9.8	
Total Fines	39.4		35.7		52.2		54		64.8		40.4		62.4	

Exceeds the SQS

Exceeds Both Criteria

Exceeds SQS but lab reports Non-Detect

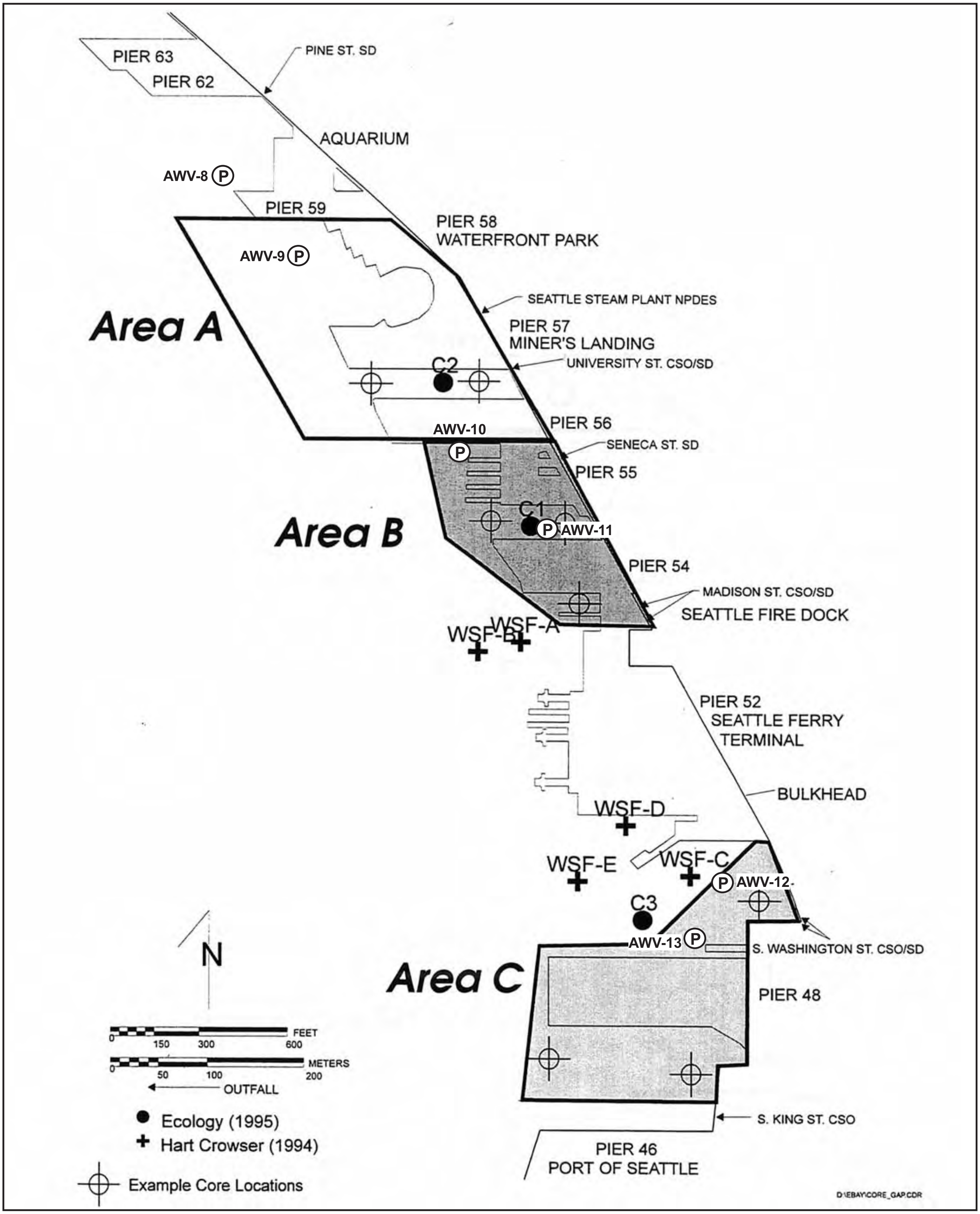
Exceeds both but lab reports Non-Detect



Parametrix Alaskan Way Viaduct 553-1585-002/06(063) 2/04 (K)

Source: Anchor Environmental LLC

Exhibit B-15
Denny Way Sediment Remediation Project Map

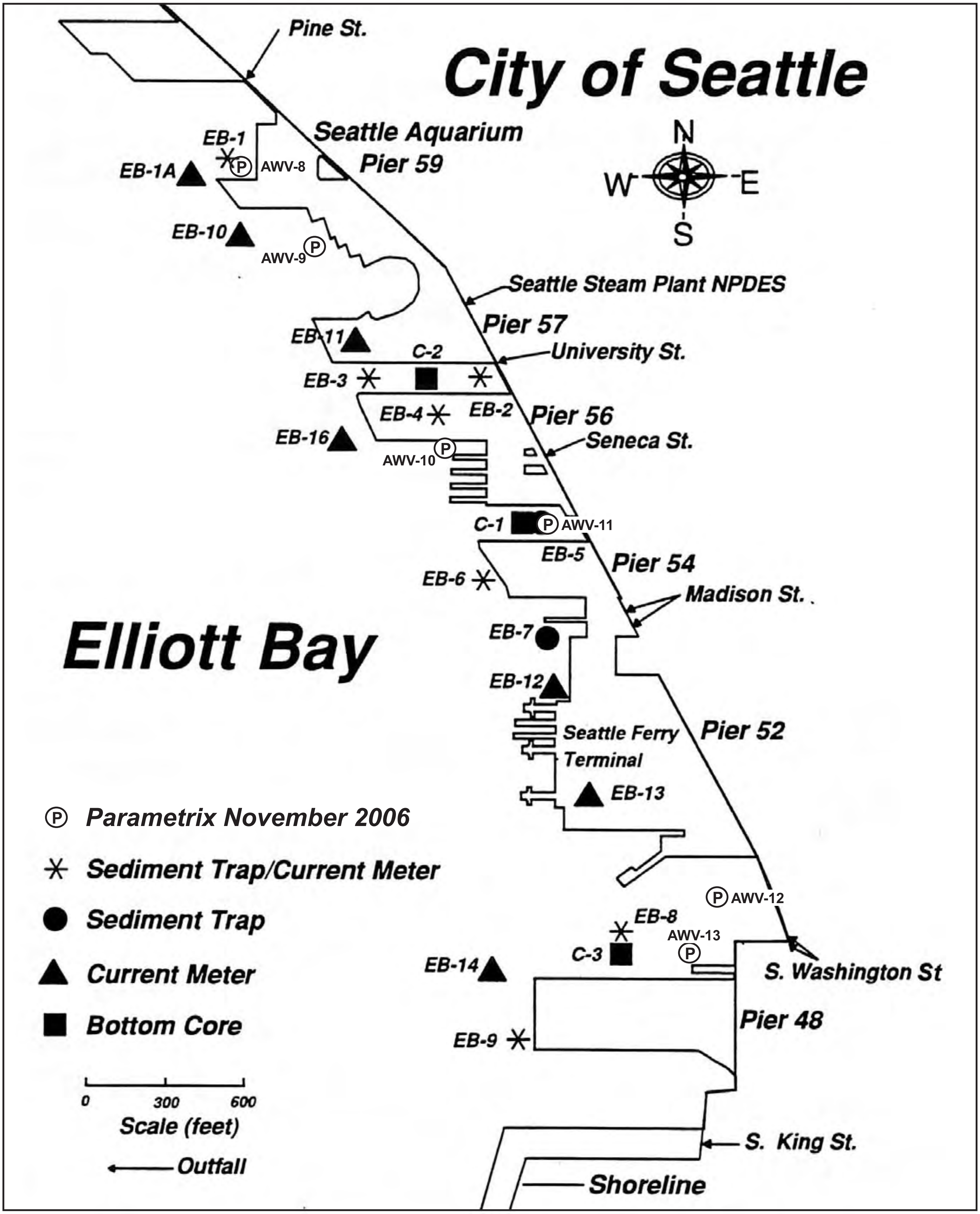


Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

(P) Parametrix data (11/2006)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-16
Subsurface Sediment Sample Locations



Alaskan Way Viaduct 554-1585-030/AY(04) 5/07 (B)

Figure taken from:
Aura Nova Consultants Inc. and Ecology, 1995

Exhibit B-17
Sediment Sample Locations for the Elliott Bay Waterfront Recontamination Study

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