Lower Duwamish Waterway
RM 1.7 to 2.0 East
(Slip 2 to Slip 3)

Source Control Action Plan

June 2009

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Lower Duwamish Waterway
RM 1.7 to 2.0 East
(Slip 2 to Slip 3)

Source Control Action Plan

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Executive Summary

The purpose of this Source Control Action Plan (SCAP) is to describe potential sources of contaminants to sediments along the Lower Duwamish Waterway (LDW) River Mile (RM) 1.7 to 2.0 East, and to identify actions necessary to prevent recontamination of sediment after cleanup. This SCAP is based on a thorough review of information pertinent to sediment recontamination, as documented in *Summary of Existing Information and Identification of Data Gaps* (SAIC 2009).

The LDW, located in Seattle, Washington, was added to the National Priorities List (Superfund) by the U.S. Environmental Protection Agency (EPA) on September 13, 2001. Chemicals of concern (COCs) found in waterway sediments include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury and other metals, and phthalates. These COCs may pose threats to people, fish, and wildlife.

In December 2000, EPA and the Washington State Department of Ecology (Ecology) entered into an order with King County, the Port of Seattle, the City of Seattle, and The Boeing Company to perform a Remedial Investigation (RI) and Feasibility Study (FS) of sediment contamination in the waterway. EPA is the lead agency for the RI/FS. Ecology is the lead agency for controlling current sources of pollution to the site, in cooperation with the City of Seattle, King County, the Port of Seattle, the City of Tukwila, and EPA.

Phase 1 of the RI/FS (Windward 2003a) used existing data to identify potential human health and ecological risks, information needs, and high priority areas for cleanup. Seven candidate early action areas were identified (Windward 2003b). Data collected during Phase 2 of the RI were used to identify additional sites where long-term cleanup actions may be necessary. The RM 1.7 to 2.0 East Source Control Area (Slip 2 to Slip 3) was identified as one of these "Tier 2" sites.

As part of source control efforts in the LDW, Ecology works with other members of the Source Control Work Group (SCWG) to develop SCAPs for areas of sediment contamination that will or may require cleanup. The SCAP for each of these sediment areas describes potential sources of sediment contaminants and the actions needed to control them, and evaluates whether ongoing sources are present that could recontaminate sediments after cleanup. In addition, the SCAPs describe source control actions that are planned or currently underway, and sampling and monitoring activities that will be conducted to identify additional sources.

Sections 1 and 2 of this SCAP provide background information about the LDW site and the sediments associated with the Slip 2 to Slip 3 source control area. Lead, mercury, PAHs, phthalates, PCBs, benzoic acid, dibenzofuran, and hexachlorobenzene are considered to be the major COCs in sediments associated with the source control area. While this SCAP focuses on these COCs, other chemicals that could result in sediment recontamination will be addressed as sources are identified.

Section 3 contains the following: a description of potential sources of contamination that may affect sediments associated with the Slip 2 to Slip 3 source control area, including outfalls, spills to the waterway, and releases from adjacent or upland properties; an evaluation of the significance of these potential sources; and an identification of the actions that are planned or

underway to control potential contaminant sources. Section 4 discusses monitoring activities that will be conducted to identify additional sources and assess progress, and Section 5 describes how source control efforts will be tracked and reported. Section 6 lists documents reviewed during preparation of this SCAP.

Table ES-1 lists the source control actions that have been identified for the Slip 2 to Slip 3 source control area. This table includes a brief description of the potential contaminant sources for each property, source control activities to be conducted, parties involved in source control actions for each property or task, and milestone/target dates for completion of the identified action items. The milestones and targets are best-case scenarios based on consultation with the identified agencies or facilities. They reflect reasonably achievable schedules, and include the time required for planning, contracting, field work, laboratory analysis, and activities dependent on weather.

A removal action for sediment associated with the Slip 2 to Slip 3 source control area was not scheduled at the time this SCAP was prepared.

Table ES-1. Source Control Actions – Slip 2 to Slip 3 Source Control Area

Potential Sources	Action Items	Priority	Responsible Part(ies)	Status	Target Date
1st Avenue S Bridge Storm Drain (Outfall 2503)					
Stormwater discharges to the LDW from this 30-inch SPU outfall (2503), which drains an area of about 16 acres of mostly roadway catch basins. Stormwater passes through a vegetated swale prior to discharge to the LDW.	Assess the effectiveness of the vegetated swale in treating stormwater discharged via Outfall 2503.	Medium	Ecology	Planned	September 2011
	Conduct business inspections at properties with stormwater drainage to the 1st Avenue S Bridge outfall to verify that they are in compliance with applicable regulations/code and have implemented appropriate stormwater BMPs. Businesses with stormwater drainage to this outfall include Seattle Truck Repair, Evergreen Tractor, and the former Taco Time parcel.	Medium	SPU, Ecology	Planned	June 2010
Michigan Street CSO					
The Michigan Street CSO basin covers approximately 1,900 acres. From 2000 to 2007, combined wastewater and stormwater overflows occurred on average 11 times per year, with an annual average volume of 17.6 million gallons per year (mgy). Approximately 206 facilities with Ecology Facility/Site IDs are located in the Michigan Street CSO basin.	Provide data regarding contaminant concentrations in Michigan Street CSO discharges.	Medium	King County	Planned	December 2009
	Conduct business inspections within the Michigan Street CSO basin to identify undocumented and unregulated industrial operations, if any, that may represent sediment recontamination sources.	Low	SPU	Planned	December 2011
	Conduct a stormwater compliance inspection at the King County Airport Staging Yard/Georgetown Yard; this facility is covered under the Industrial Stormwater General Permit but no information on inspections was identified.	Low	Ecology	Planned	December 2009
Slip 2 Outfall (Glacier Northwest; Outfall 2019)					
This 24-inch concrete outfall is located at the head of Slip 2. Although located on Glacier Northwest property, it collects runoff from approximately 1,000 feet of East Marginal Way S and several private properties along the east side of East Marginal Way S.	Conduct business inspections at properties with stormwater drainage to Outfall 2019, including Bank and Office Interiors, Ener-G Foods, and Shippers Transport Express (formerly Consolidated Freightways) to verify compliance with applicable regulations and stormwater BMPs.	Medium	SPU/Ecology	Planned	June 2010
	Identify the owner of Outfall 2019 and evaluate the adequacy of existing NPDES permits with regard to stormwater discharges from this outfall.	Medium	SPU/Ecology	Planned	December 2009
	Review response to EPA CERCLA Section 104(e) Request for Information submitted by Ener-G Foods to determine whether this facility is a potential source of LDW sediment recontamination.	Medium	Ecology	Planned	March 2010

Potential Sources	Action Items	Priority	Responsible Part(ies)	Status	Target Date
Glacier Northwest, Inc. (5975 East Marginal Way S)					
This property is adjacent to the LDW. Previous petroleum hydrocarbon contamination at this property has been cleaned up. Insufficient information is available regarding direct discharges to Slip 2.	Conduct a follow-up source control inspection to verify compliance with previous recommendations.	Medium	Ecology	Planned	October 2009
	Request additional information from Glacier Northwest regarding the process water treatment and recycling system at the facility, including the capacity of the system and the frequency and volume of discharges to the LDW. If discharges are frequent, collect catch basin solids samples and/or effluent discharge samples as needed.	Medium	Ecology	Planned	October 2009
	Request additional information from Glacier Northwest regarding (a) the trench drain installed in 1985; (b) the storm drain line shown on SPU maps that appears to discharge to Slip 2 approximately half-way between the head and mouth of the slip; (c) connections to Outfall 2018, if any; and (d) ownership of Outfall 2019.	Medium	Ecology	Planned	October 2009
	Review information submitted by Glacier Northwest in response to EPA's CERCLA Section 104(e) Request for Information.	Medium	Ecology	Planned	March 2010
Seattle Biodiesel (6335 1st Avenue S)					
This property is adjacent to the LDW. Stormwater has been observed to flow from storage and loading areas to the LDW via surface runoff. In July 2007, a 793-gallon spill of process mixture (crude glycerin, methanol, vegetable oil) to Slip 2 occurred as the material was being transferred into 300-gallon totes. Material flowed across pavement, over banks, and into Slip 2. Approximately 770 gallons of spilled material was recovered.	Conduct a follow-up source control inspection to verify compliance with Ecology recommendations, applicable regulations, and BMPs.	Medium	Ecology	Planned	October 2009
	Collect information regarding chemical concentrations in bank soils.	Medium	Ecology	Planned	June 2010
	Review information submitted by Lonestar Investors LP (the property owner) in response to EPA's CERCLA Section 104(e) Request for Information.	Medium	Ecology	Planned	March 2010

Potential Sources	Action Items	Priority	Responsible Part(ies)	Status	Target Date
Duwamish Marine Center (16 S Michigan Street; 6365 1st Avenue S)					
This property is adjacent to the LDW; businesses operating at this location include Duwamish Marine Center, Samson Tug and Barge, and Duwamish Metal Fabricators. Soil and groundwater contamination associated with historical activities at this property includes PCBs, PAHs, metals and petroleum hydrocarbons. Two private outfalls are present, but no information on discharges is available.	Conduct a follow-up source control inspection at Duwamish Marine Center to verify that they are in compliance with applicable regulations/code and have implemented appropriate stormwater BMPs.	Medium	Ecology, SPU	Planned	September 2009
	Conduct a follow-up business inspection at Samson Tug and Barge to verify compliance with corrective actions requested by SPU in July and October 2008. Also verify that the cleaning solution tank belonging to Burgess Enterprises has been removed.	Medium	SPU	Planned	September 2009
	Determine the status of Outfalls 2021 and 2022; if they are currently in use, determine the area drained by these outfalls and assess the potential for COCs to reach the LDW via this pathway.	High	SPU, Ecology	Planned	September 2009
	Verify the status of NPDES permits for Samson Tug and Barge and Duwamish Metal Fabricators.	Medium	Ecology	Planned	September 2009
	Require the property owner/operator to collection additional soil/groundwater data. (In April 2008, Ecology approved a sampling plan for the Duwamish Marine Center, with conditions. The data collected during this evaluation may be sufficient to evaluate the potential for sediment recontamination.)	High	Ecology	In Progress	December 2009
	Require the property owner/operator to collect data on concentrations of chemical contaminants in river bank soils to assess the potential for sediment recontamination by erosion.	High	Ecology	Planned	December 2009
	Review information submitted by James Gilmur and Samson Tug and Barge in response to EPA's CERCLA Section 104(e) Requests for Information.	Medium	Ecology	Planned	March 2010
Seattle Department of Transportation Parcel (6501 1st Avenue S)					
A vegetated swale associated with the 1st Avenue S Bridge outfall is located on this property. The parcel is reportedly used by transients and truckers to park vehicles.	Continue discussions with the adjacent property owner to prevent parking and vehicle maintenance on the Seattle DOT property.	Low	SPU	In Progress	December 2009
Former Frank's Used Cars (6309 East Marginal Way S)					
Shallow soil contamination (metals, PCBs, VOCs) is present at this upland property; the site is	Conduct a brief site visit to assess current site conditions and determine whether stormwater from this property is a potential source of sediment recontamination.	Low	Ecology, SPU	Planned	December 2010

Potential Sources	Action Items	Priority	Responsible Part(ies)	Status	Target Date
currently vacant. The most recent data is over 15 years old.	Review the current status of cleanup activities at this site to determine whether residual soil contamination poses a risk of sediment recontamination.	Medium	Ecology	Planned	December 2009
Bank and Office Interiors/Other Tenants (5960 1st Avenue S; 5990 1st Avenue S)					
Little information is available about activities at this upland property; stormwater drains to the 1st Avenue S Bridge outfall.	Conduct source control inspections at Bank and Office Interiors and other businesses located on this property.	Medium	SPU, Ecology	Planned	June 2010
	Review information submitted by Ener-G Foods in response to EPA's CERCLA 104(e) Request for Information.	Low	Ecology	Planned	March 2010
Fittings, Inc. (5979 4th Avenue S)					
Stormwater from this upland property drains to the 1st Avenue S Bridge outfall. August 2008 inspection found Fittings, Inc. to be in compliance with stormwater regulations.	Determine whether this facility should apply for coverage under the Industrial Stormwater General Permit	Medium	Ecology	Planned	September 2009
Former Consolidated Freightways (6050 East Marginal Way S)					
Historical operations at this upland property have resulted in contamination of soil and groundwater with PAHs and petroleum hydrocarbons. Stormwater on the western edge of the property drains to Slip 2 via Outfall 2019.	Conduct a site inspection to identify whether activities along the western edge of the property (in the area that drains to Slip 2) could be a source of sediment recontamination via stormwater discharge.	Low	Ecology, SPU	Planned	June 2010
	Locate and review the results of soil and groundwater sampling proposed in 2000 (if the sampling plans were implemented), and assess the potential for sediment recontamination via groundwater transport.	Medium	Ecology	Planned	December 2009
	Search for additional information regarding the two dump areas located at this property in 1940, as identified in historical aerial photographs, and evaluate the potential for sediment recontamination associated with these areas.	Medium	Ecology	Planned	December 2010
Facilities Within the Michigan Street CSO Basin					
There are approximately 206 facilities within the CSO basin with Ecology Facility/Site IDs, including 22 listed on the CSCSL, 77 listed on Ecology's UST or LUST lists, 22 with NPDES permits, and 14 with KCIW discharge authorizations or permits. Because combined	Emerald Tool, Inc.: Conduct a business inspection at this facility; request information regarding concentrations of sediment COCs in soil and catch basins at this property.	Low	SPU, Ecology	Planned	December 2010
	Kelly Moore Paint Company: Assess the current nature and extent of soil and groundwater contamination associated with this facility to determine the potential for contaminated groundwater to infiltrate the combined sewer system.	Low	Ecology	Planned	December 2010
	Kelly Moore Paint Company: Determine the current status of cleanup efforts to evaluate whether additional remedial activities are required.	Low	Ecology	Planned	December 2010

Potential Sources	Action Items	Priority	Responsible Part(ies)	Status	Target Date
sewer discharges are significantly diluted prior to discharge, the potential that contaminants from these properties will impact sediments associated with the Slip 2 to Slip 3 source control area is low.	Pioneer Porcelain Enamel Company: Conduct a business inspection to assess current activities at the site and verify that they are in compliance with applicable regulations/code and have implemented appropriate stormwater BMPs.	Low	SPU, Ecology	Planned	December 2010
	Former Unocal Service Station 0907: Conduct a site inspection to verify current activities at the site and that activities are in compliance with applicable regulations/code and that appropriate stormwater BMPs have been implemented.	Low	Ecology	Planned	December 2010
	Pioneer Porcelain Enamel Company, Scougal Rubber Corporation, former Sonn Property, former Unocal Service Station 0907, Winters Investment LP/Riveretz's Auto Care/Former Georgetown Gasco/Tesoro: Request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.	Low	Ecology	Planned	December 2010

Priority:

High priority action item – to be completed prior to sediment cleanup
Medium priority action item – to be completed prior to or concurrent with sediment cleanup
Low priority action item – ongoing actions or actions to be completed as resources become available

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Acronyms/Abbreviations

AST	aboveground storage tank
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BMP	best management practice
BOI	Bank and Office Interiors
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
DOT	Department of Transportation
EAA	Early Action Area
Ecology	Washington State Department of Ecology
EF	exceedance factor
EPA	United States Environmental Protection Agency
FS	Feasibility Study
GIS	geographic information systems
gpm	gallons per minute
KCIW	King County Industrial Waste
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LUST	leaking underground storage tank
MEK	methyl ethyl ketone
mgy	million gallons per year
MTBE	methyl tertiary butyl ether
MTCA	Washington State Model Toxics Control Act
NFA	No Further Action
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PSC	Philips Services Corporation
PSCAA	Puget Sound Clean Air Agency
PSDDA	Puget Sound Dredged Disposal Analysis
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RM	river mile
ROD	Record of Decision
SAIC	Science Applications International Corporation
SCAP	Source Control Action Plan
SCWG	Source Control Work Group
SD	storm drain
SHA	Site Hazard Assessment

Acronyms/Abbreviations (Continued)

SMS	Sediment Management Standards
SPU	Seattle Public Utilities
SQS	Sediment Quality Standards
SVOC	semivolatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSDF	treatment, storage, or disposal facility
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WSDOT	Washington State Department of Transportation

1.0 Introduction

This Source Control Action Plan (SCAP) describes potential sources of contamination that may affect sediments in and adjacent to the River Mile (RM) 1.7 to 2.0 East[1] (Slip 2 to Slip 3) Source Control Area.[2] The purpose of this plan is to evaluate the significance of these sources and to determine if actions are needed to minimize the potential for recontamination of sediment associated with the Slip 2 to Slip 3 source control area after cleanup. In addition, this SCAP describes:

- Source control actions/programs that are planned or currently underway,
- Sampling and monitoring activities that will be conducted to identify additional sources and assess progress, and
- How these source control efforts will be tracked and reported.

The information in this document was obtained from a variety of sources, including the following documents:

- *Lower Duwamish Waterway, RM 1.7 to 2.0 East, Slip 2 to Slip 3 – Summary of Existing Information and Identification of Data Gaps*, Science Applications International Corporation (SAIC), February 2009, located on Ecology's website: http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/sites/RM_17_20/RM17_20E_Slips2-3.html
- *Lower Duwamish Waterway Source Control Strategy*, Washington State Department of Ecology, January 2004, located on Ecology's website: http://www.ecy.wa.gov/pubs/0409043.pdf

1.1 Organization of Document

Section 1 of this SCAP describes the Lower Duwamish Waterway (LDW) site, the strategy for source control, and the responsibilities of the public agencies involved in source control for the LDW. Section 2 provides background information on the Slip 2 to Slip 3 source control area, including a description of the chemicals of concern (COCs) for sediments. Section 3 provides an overview of potential sources of contaminants that may affect sediments associated with the Slip 2 to Slip 3 source control area, including outfalls, spills, properties adjacent to the LDW, and upland properties. Section 3 also describes actions planned or currently underway to control potential sources of contaminants, while Sections 4 and 5 describe monitoring and tracking/reporting activities, respectively. References are listed in Section 6, and figures are presented at the end of the document.

As new information about the sites and potential sources discussed in this document becomes available and as source control progress is made, Ecology will update the information in this SCAP as needed. The status of source control actions is summarized in the LDW Source Control Status Reports (Ecology 2007b, 2008a, 2008b, and as updated).

[1] River miles as defined in this report are measured from the southern tip of Harbor Island.
[2] This SCAP incorporates data published through January 31, 2009. Section 5, Tracking and Reporting of Source Control Activities, describes how newer data will be disseminated.

1.2 Lower Duwamish Waterway Site

The LDW is the downstream portion of the Duwamish River, extending from the southern tip of Harbor Island to just south of Turning Basin 3 (Figure 1). It is a major shipping route for bulk and containerized cargo. Most of the upland areas adjacent to the LDW have been developed for industrial and commercial operations. These include cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, and aerospace manufacturing. In addition to industry, the river is used for fishing, recreation, and wildlife habitat. Residential areas near the waterway include the South Park and Georgetown neighborhoods. Beginning in 1913, this portion of the Duwamish River was dredged and straightened to promote navigation and industrial development, resulting in the river's current form. Shoreline features within the waterway include constructed bulkheads, piers, wharves, buildings extending over the water, and steeply sloped banks armored with riprap or other fill materials (Weston 1999). This development left intertidal habitats dispersed in relatively small patches, with the exception of Kellogg Island, which is the largest contiguous area of intertidal habitat remaining in the Duwamish River (Tanner 1991). Over the past 20 years, public agencies and volunteer organizations have worked to restore intertidal and subtidal habitat to the river. Some of the largest restoration projects are at Herring House Park/Terminal 107, Turning Basin 3, Hamm Creek, and Terminal 105.

The presence of chemical contamination in the LDW has been recognized since the 1970s (Windward 2003a). In 1988, the United States Environmental Protection Agency (EPA) investigated sediments in the LDW as part of the Elliott Bay Action Program. Problem chemicals identified by the EPA study included metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), phthalates, and other organic compounds. In 1999, EPA completed a study of approximately 6 miles of the waterway, from the southern tip of Harbor Island to just south of the turning basin near the Norfolk combined sewer overflow (Weston 1999). This study confirmed the presence of PCBs, PAHs, phthalates, mercury, and other metals. These contaminants may pose threats to people, fish, and wildlife.

In December 2000, EPA and the Washington State Department of Ecology (Ecology) signed an agreement with King County, the Port of Seattle, the City of Seattle, and The Boeing Company, collectively known as the Lower Duwamish Waterway Group (LDWG). Under the agreement, the LDWG is conducting a Remedial Investigation (RI) and Feasibility Study (FS) of the LDW to assess risks to human health and the environment and to evaluate cleanup alternatives. The RI for the site is being done in two phases. Results of Phase 1 were published in July 2003 (Windward 2003a). The Phase 1 RI used existing data to characterize the nature and extent of chemical distributions in LDW sediments, develop preliminary risk estimates, and identify candidate sites for early cleanup action. The Phase 2 RI is currently underway and is designed to fill critical data gaps identified in Phase 1. Based on the results of the Phase 2 RI, additional areas for cleanup may be identified. During Phase 2, an FS is being conducted that will address cleanup options for contaminated sediments in the LDW.

On September 13, 2001, EPA added the LDW to its National Priorities List. This is EPA's list of hazardous waste sites that warrant further investigation and cleanup under Superfund. Ecology added the site to the Washington State Hazardous Sites List on February 26, 2002.

An interagency Memorandum of Understanding, signed by EPA and Ecology in April 2002 and updated in April 2004, divides responsibilities for the site (EPA and Ecology 2002; EPA and Ecology 2004a). EPA is the lead agency for the RI/FS, while Ecology is the lead agency for source control issues.

In June 2003, the *Technical Memorandum: Data Analysis and Candidate Site Identification* (Windward 2003b) was issued. Seven candidate sites for early action (Early Action Areas [EAAs]) were recommended (Figure 1). The sites are:

- Area 1: Duwamish/Diagonal combined sewer overflow (CSO) and storm drain (SD),
- Area 2: West side of the waterway, just south of the First Avenue S. Bridge, approximately 2.2 miles from the south end of Harbor Island,
- Area 3: Slip 4, approximately 2.8 miles from the south end of Harbor Island,
- Area 4: South of Slip 4, on the east side of the waterway, just offshore of the Boeing Plant 2 and Jorgensen Forge properties, approximately 2.9 to 3.7 miles from the south end of Harbor Island,
- Area 5: Terminal 117 and adjacent properties, approximately 3.6 miles from the south end of Harbor Island, on the west side of the waterway,
- Area 6: East side of the waterway, approximately 3.8 miles from the south end of Harbor Island, and
- Area 7: Norfolk CSO/SD, on the east side of the waterway, approximately 4.9 to 5.5 miles from the south end of Harbor Island.

Of the seven recommended EAAs, five either had sponsors to begin investigations or were already under investigation by a member or group of members of the LDWG. These five sites are: Slip 4, Terminal 117, Boeing Plant 2, Duwamish/Diagonal CSO/SD, and Norfolk CSO/SD. EPA is the lead agency for managing cleanup at Terminal 117 and Slip 4. The other three early action cleanup projects were begun before the current LDW RI/FS was initiated. Cleanup at Boeing Plant 2, under EPA Resource Conservation and Recovery Act (RCRA) management, is currently in the planning stage. The Duwamish/Diagonal CSO/SD and Norfolk CSO/SD cleanups are under King County management as part of the Elliott Bay-Duwamish Restoration Program. Cleanup at Duwamish/Diagonal was partially completed in March 2004; a partial sediment cleanup was conducted at Norfolk CSO/SD in 1999. Early action cleanups may involve members of the LDWG or other parties as appropriate. Planning and implementation of early action cleanups is being conducted concurrently with the Phase 2 investigation.

In 2007, Ecology, in consultation with EPA, identified eight additional source control areas based on available sediment data, size of the upland basin draining to the source control area, and general knowledge about facilities operating in the basin. In February 2008, Ecology identified the areas of the LDW not covered by a SCAP or planned SCAP. Using the same criteria as in 2007, eight additional potential source control areas were added to the list (Ecology 2008a). The seven EAAs and 16 additional source control areas are shown in Figure 1.

Further information about the LDW can be found at:
http://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish and
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/lower_duwamish_hp.html.

1.3 LDW Source Control Strategy

The LDW Source Control Strategy (Ecology 2004a) describes the process for identifying source control issues and implementing effective source controls for the LDW. The plan is to identify and manage sources of potential contamination and recontamination in coordination with sediment cleanups. The goal of the strategy is to minimize the potential for recontamination of sediments to levels exceeding the LDW sediment cleanup goals and the Washington State Sediment Management Standards (SMS).[3] Existing administrative and legal authorities will be used to perform inspections and require necessary source control actions.

The strategy is being implemented through the development of a series of detailed, area-specific SCAPs that will be coordinated with sediment cleanups, beginning with the EAAs. Each SCAP will document what is known about the area, the potential sources of recontamination, actions taken to address them, and how to determine when adequate source control is achieved for an area. Because the scope of source control for each site will vary, it is necessary to adapt each plan to the specific situation at that site. The success of this strategy depends on the coordination and cooperation of all public agencies with responsibility for source control in the LDW area, as well as prompt compliance by the businesses that must make necessary changes to control releases from their properties.

The source control strategy focuses on controlling contamination that affects LDW sediments. It is based on the principles of source control for sediment sites described in EPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites; February 12, 2002* (EPA 2002), and Ecology's SMS. The first principle is to control sources early, starting with identifying all ongoing sources of contaminants to the site. EPA's Record of Decision (ROD) for the site will require that sources of sediment contamination to the entire site be evaluated, investigated, and controlled as necessary. Dividing source control work into specific SCAPs and prioritizing those plans to coordinate with sediment cleanups will address the guidance and regulations and will be consistent with the selected remedial actions in the EPA ROD.

Source control priorities are divided into four tiers. Tier 1 consists of source control actions associated with EAA sediment cleanups. Tier 2 consists of source control actions associated with cleanup areas identified in Phase 2 of the RI/FS and EPA's ROD. Tier 3 consists of source control necessary to prevent future sediment contamination from basins that may not drain directly to an identified sediment cleanup area. Tier 4 consists of source control necessary to address any recontamination identified by post-cleanup sediment monitoring (Ecology 2008a). This document is a SCAP for a Tier 2 Source Control Area.

Further information about the LDW Source Control Strategy can be found at:
http://www.ecy.wa.gov/biblio/0409052.html and
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/lower_duwamish_hp.html.

[3] Washington Administrative Code 173-204

1.4 Source Control Work Group

The primary public agencies responsible for source control for the LDW are Ecology, the City of Seattle, King County, Port of Seattle, City of Tukwila, and EPA. All of these agencies, except the City of Tukwila, are involved in the source control activities for the Slip to Slip 3 source control area.

In order to coordinate among these agencies, Ecology formed the Source Control Work Group (SCWG) in January 2002. The purpose of the SCWG is to share information, discuss strategy, actively participate in developing SCAPs, jointly implement source control measures, and share progress reports on source control activities for the LDW area. The monthly SCWG meetings are chaired by Ecology. All final decisions on source control actions and completeness will be made by Ecology, in consultation with EPA, as outlined in the April 2004 Ecology/EPA LDW Memorandum of Understanding (EPA and Ecology 2004).

Other public agencies with relevant source control responsibilities include the Washington State Department of Transportation, Puget Sound Clean Air Agency, and the Seattle/King County Department of Public Health. These agencies are invited to participate in source control with the SCWG as appropriate (Ecology 2004a).

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2.0 River Mile 1.7 to 2.0 East (Slip 2 to Slip 3)

The Slip 2 to Slip 3 source control area is located along the eastern side of the LDW Superfund Site between 1.7 and 2.0 miles from the southern tip of Harbor Island (Figure 1). Elevated concentrations of chemicals, including metals, PAHs, phthalates, and PCBs, have been measured in sediments associated with the Slip 2 to Slip 3 source control area; these may be a result of historical and/or ongoing sources within the source control area. Chemicals may have entered the LDW through direct discharges, spills, bank erosion, groundwater discharge, surface water runoff, atmospheric deposition, or other non-point source discharges.

River Mile 1.7 to 2.0 East (Slip 2 to Slip 3) encompasses Slip 2, as shown in Figure 2, extending south to the 1st Avenue S Bridge. Slip 3 and associated sources are discussed as part of the Slip 3 to Seattle Boiler Works (RM 2.0 to 2.3 East) source control area.[4]

In the late 1800s and early 1900s, extensive topographic modifications were made to the Duwamish River to create a straightened channel; many of the current side slips, including Slip 2, are remnants of these old river meanders. Groundwater flow in the Slip 2 to Slip 3 source control area is generally to the west-southwest, toward the LDW and Slip 2.

Sediments associated with the Slip 2 to Slip 3 source control area consist of greater than 60 percent fines along the north side and head of Slip 2, with very coarse material (0 to 20 percent fines) along the southern side of Slip 2, becoming finer-grained along the shoreline to the south (Windward 2003a). The area around the Michigan Street CSO and 1st Avenue S Bridge outfalls consists of 60 to 80 percent fines. Total organic carbon (TOC) in this area ranges from 0.11 to 3.34 percent (SAIC 2009).

2.1 Chemicals of Concern in Sediment

Several environmental investigations have included the collection of sediment associated with the Slip 2 to Slip 3 source control area (Figure 3), including the following:

- Two subsurface sediment samples collected for Lone Star Northwest and Hardie Gypsum in 1995 (Hartman 1995);
- Ten surface sediment samples collected as part of a National Oceanic and Atmospheric Administration (NOAA) sediment characterization of the Duwamish River in 1997 (NOAA 1998);
- One surface sediment sample collected during Puget Sound sediment sampling conducted by Ecology in 1998 (Ecology 2000a);
- Fifteen surface sediment and two subsurface sediment samples collected during an EPA Site Inspection in 1998 (Weston 1999);
- One surface sediment and nine subsurface sediment samples collected for Hardie Gypsum in 1998-2000 (Spearman 1999; Weston 2000);

[4] A Data Gaps report for the Slip 3 to Seattle Boiler Works source control area was published in June 2008 (Ecology and Environment 2008); a SCAP is currently in preparation.

- Five subsurface sediment samples collected as part of the Puget Sound Dredged Disposal Analysis (PSDDA) program in 1999 (SEA 2000a, 2000b);
- Nine surface sediment and 21 subsurface sediment samples collected during the LDW Phase 2 RI (Windward 2005a, 2005b, 2007a, 2007b).

Sediment data associated with the Slip 2 to Slip 3 source control area are detailed in *Summary of Existing Information and Identification of Data Gaps* (SAIC 2009), referred to in this document as the Slip 2 to Slip 3 Data Gaps report. Chemical data were compared to the SMS, which include both the Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) (WAC 173-204). Sediments that meet the SQS criteria have a low likelihood of adverse effects on sediment-dwelling biological resources. However, an exceedance of the SQS numerical criteria does not necessarily indicate adverse effects or toxicity, and the degree of SQS exceedance does not correspond to the level of sediment toxicity. The CSL is greater than or equal to the SQS and represents a higher level of risk to benthic organisms than SQS levels. The SQS and CSL values provide a basis for identifying sediments that may pose a risk to some ecological receptors. The SMS for most organic chemicals are based on total organic carbon (OC)-normalized concentrations.

Chemicals of concern were identified based on the results the sediment sampling in the vicinity of the Slip 2 to Slip 3 source control area, as identified above. Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample are considered COCs for the Slip 2 to Slip 3 source control area. The greatest exceedances were observed for PCBs at sample locations on the southeastern side of Slip 2 at depths of 1 to 4 feet, and between the southern end of Slip 2 and the 1st Avenue S Bridge at depths of 1.0 to 1.5 feet (Figure 3). Additional information on SQS/CSL exceedances is provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

The following chemicals were detected at concentrations above the SQS/CSL in sediments associated with the Slip 2 to Slip 3 source control area, and are considered sediment COCs. In addition, although no sediment quality standards have been promulgated, dioxins and furans are considered to be COCs at the Slip 2 to Slip 3 source control area due to their presence in relatively high concentrations (total TCDD concentrations up to 5.3 nanograms per kilogram) (SAIC 2009).

Chemicals of Concern	**Surface Sediment**		**Subsurface Sediment**	
	> SQS	**> CSL**	**> SQS**	**> CSL**
Metals				
Lead			●	
Mercury			●	
PAHs				
Acenaphthene			●	●
Benzo(g,h,i)perylene	●			
Chrysene	●			
Fluoranthene			●	
Fluorene			●	●
Indeno(1,2,3-cd)pyrene	●			
Phenanthrene			●	

Chemicals of Concern	Surface Sediment		Subsurface Sediment	
	> SQS	> CSL	> SQS	> CSL
Phthalates				
Bis (2-ethylhexyl)phthalate (BEHP)			●	
Butyl benzyl phthalate	●			
Other SVOCs				
Benzoic acid	●	●		
Dibenzofuran			●	●
Hexachlorobenzene			●	
PCBs				
PCBs	●		●	●
Other Chemicals				
Dioxins/furans	NA	NA	NA	NA

NA = not applicable SVOC = semivolatile organic compound

2.2 Potential Pathways to Sediment

There are six outfalls discharging to the LDW within the Slip 2 to Slip 3 source control area, including four private and two public outfalls (Figure 2). The public outfalls in this area include the 1st Avenue S Bridge outfall (Outfall 2503) and the Michigan Street CSO. Facilities that may represent sources of contaminants to sediments along RM 1.7 to 2.0 East are considered to be within the Slip 2 to Slip 3 source control area; these include facilities located directly adjacent to the LDW, facilities that are not directly adjacent to the waterway but are within a storm drain basin that discharges to the LDW within the RM 1.7 to 2.0 East area, and facilities within the Michigan Street CSO basin.

Transport pathways that could contribute to the recontamination of sediments associated with the Slip 2 to Slip 3 source control area following remedial activities include direct discharges via storm drain outfalls and the Michigan Street CSO, surface runoff (sheet flow) from adjacent properties, bank erosion, groundwater discharges, air deposition, and spills directly to the LDW. Relevant pathways are described briefly below, and are discussed in more detail in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). Specific contaminant sources and transport pathways are discussed in Section 3.

Direct Discharges from Outfalls

Direct discharges may occur from public or private storm drain systems or the Michigan Street CSO. The LDW area is served by a combination of separated storm drain and sanitary sewers, and combined sewer systems. Storm drains convey stormwater runoff collected from streets, parking lots, roof drains, and residential, commercial, and industrial properties to the waterway. In the LDW, there are both public and private storm drain systems. Most of the waterfront properties along the LDW are served by privately owned systems that discharge directly to the waterway. The other upland areas are served by a combination of private and publicly owned systems.

Storm drains entering the LDW carry runoff generated by rain and snow. A wide range of chemicals may become dissolved or suspended in runoff as rainwater flows over the land. Urban areas may accumulate particulates, dust, oil, asphalt, rust, rubber, metals, pesticides, detergents, or other materials as a result of urban activities. These can be flushed into storm drains during wet weather. Storm drains can also convey materials from businesses with permitted discharges (i.e., National Pollutant Discharge Elimination System [NPDES] industrial stormwater permits), vehicle washing, runoff from landscaped areas, erosion of contaminated soil, groundwater infiltration, and materials illegally dumped into the system.

Some areas of the LDW are served by combined sewer systems, which carry both stormwater and municipal/industrial wastewater in a single pipe. These systems were generally constructed before about 1970 because it was less expensive to install a single pipe rather than separate storm and sanitary systems. Under normal rainfall conditions, wastewater and stormwater are conveyed through this combined sewer pipe to a wastewater treatment facility. During large storm events, however, the total volume of wastewater and stormwater can sometimes exceed the conveyance and treatment capacity of the combined sewer system. When this occurs, the combined sewer system is designed to overflow through relief points, called CSOs. The CSOs prevent the combined sewer system from backing up and creating flooding problems.

Additional information on public storm drains and CSOs is presented in the Slip 2 to Slip 3 Data Gaps report. Outfalls located within the Slip 2 to Slip 3 source control area are discussed in Section 3.1. Six outfalls are located within the source control area, including one publicly owned storm drain, one CSO outfall, and four privately owned outfalls:

Outfall Name	Diameter/Material	Outfall Type (Owner)
2503 - 1st Avenue S Bridge	30-inch concrete	Public SD (SPU)
2502 – Michigan Street CSO	8-foot steel gate	Public CSO (King County)
2018 - Glacier Northwest	8-inch PVC	Permitted private SD (Glacier Northwest)
2019 - Glacier Northwest (Slip 2 Outfall)	24-inch concrete	Permitted private SD (Glacier Northwest)
2021 - Gilmur	6-inch PVC	Private SD (James Gilmur)
2022 - Gilmur	8-inch PVC	Private SD (James Gilmur)

These are discussed in more detail in Section 3.

Surface Runoff (Sheet Flow)

In areas lacking collection systems, spills or leaks on properties adjacent to the LDW could flow directly over impervious surfaces or through creeks and ditches to the waterway. Current operational practices at adjacent properties may contribute to the movement of contaminants to the LDW via runoff.

Groundwater Discharges

Contaminants in soil resulting from spills and releases to adjacent (and possibly upland) properties may be transported to groundwater and subsequently be released to the LDW. Contaminated groundwater and flow directions towards the LDW have been documented at properties within the Slip 2 to Slip 3 source control area (Figure 4). Figure 4 also shows outfall locations and areas of known or suspected soil and groundwater contamination that are discussed later in this SCAP. Contaminated groundwater at upland properties may infiltrate into the storm drain system and be discharged to the LDW.

Bank Erosion

The banks of the LDW shoreline are susceptible to erosion by wind and surface water, particularly in areas where banks are steep. Shoreline armoring and the presence of vegetation reduce the potential for bank erosion. Contaminants in soils along the banks of the Slip 2 to Slip 3 source control area could be released directly to sediments via erosion.

Spills to the LDW

Near-water and over-water activities have the potential to impact adjacent sediments from spills of material containing COCs. Glacier Northwest and Duwamish Marine Center conduct loading and unloading activities within the Slip 2 to Slip 3 source control areas. Accidental spills during loading/unloading operations may result in transport of contaminants to sediment.

Atmospheric Deposition

Atmospheric deposition occurs when air pollutants enter the LDW directly or through stormwater. Air pollutants may be generated from point or non-point sources. Point sources include industrial facilities, and air pollutants may be generated from painting, sandblasting, loading/unloading of raw materials, and other activities, or through industrial smokestacks. Non-point sources include dispersed sources such as vehicle emissions, aircraft exhaust, and off-gassing from common materials such as plastics. Air pollutants may be transported over long distances by wind, and can be deposited to land and water surfaces by precipitation or particle deposition. Glacier Northwest is currently registered with the Puget Sound Clean Air Agency as a regulated source of air emissions.

Additional information on recent and ongoing atmospheric deposition studies in the LDW area is summarized in the LDW Source Control Status Report (Ecology 2007b, 2008a, 2008b, and subsequent updates); Ecology will continue to monitor these efforts.

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3.0 Potential Sources of Sediment Recontamination

Potential sources of sediment recontamination are described in detail in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). This section summarizes the information on public and private outfalls (Section 3.1), adjacent properties (Section 3.2), upland properties (Section 3.3), and properties associated with the Michigan Street CSO basin (Section 3.4).

3.1 Outfalls

Human activities include landscaping, spills, illegal dumping, vehicle maintenance (fueling, washing), and vehicle use (wear on roads, tires, brakes, fluid leaks, and emissions). These materials can be flushed into storm drains during wet weather and are then conveyed to the waterway, mainly through the stormwater system. In addition, contaminants in soil or groundwater could enter the storm drain system through cracks or gaps in the stormwater piping.

One public storm drain, one CSO outfall, and several private outfalls discharge to the LDW in the vicinity of RM 1.7 to 2.0 East (Figure 5). These are described below.

3.1.1 1st Avenue S Bridge Storm Drain (Outfall 2503)

The 1st Avenue S Bridge outfall drains an area of about 16 acres (Schmoyer 2008b). Catch basins on approximately 1,500 feet of 1st Avenue S, the 1st Avenue S northbound off-ramp, S Michigan Street, and S Front Street between the Washington State Department of Transportation (WSDOT) and former Frank's Used Cars properties, are connected to this outfall. Drainage ditches beneath the 1st Avenue S Bridge are also connected to this storm drain (Figure 5). Stormwater draining from the former Frank's Used Cars (see Section 3.3.1 below), Seattle Truck Repair (6401 Occidental Ave S), Evergreen Tractor (164 S Michigan Street), and the former Taco Time parcel (6442 East Marginal Way S) may be discharged to the LDW through this storm drain.

Stormwater passes through a biofiltration swale before discharging to the LDW (Schmoyer 2008b). A biofiltration swale is a vegetated stormwater treatment system that removes pollutants by means of sedimentation, filtration, soil sorption, and/or plant uptake.

The outfall is located on WSDOT property. According to SPU staff, however, Outfall 2503 is owned by Seattle Public Utilities (SPU) (Schmoyer 2009). The biofiltration swale is located mainly on property owned by the Seattle Department of Transportation.

Potential for Future Releases to LDW Sediments

While SPU did not collect data for COCs in the 1st Avenue S Bridge storm drain, they have collected data from catch basins located elsewhere in the city right-of-ways in efforts to evaluate the presence and concentrations of COCs relative to the greater LDW drainage area. Based on this broad set of data, they found that zinc, total petroleum hydrocarbons (TPH)-oil, and BEHP are the contaminants that most frequently exceeded sediment standards (or MTCA Method A for TPH). The following key findings were observed in SPU's roadway catch basin samples (Ecology 2007b):

- Zinc exceeded the SQS in 16 of 54 samples (29 percent); two samples exceeded the SQS for mercury, and one sample exceeded the SQS for copper and lead;
- TPH-oil exceeded the MTCA Method A cleanup level in about 50 percent of the samples;
- PAH concentrations were generally low—only five of 54 samples exceeded the SQS for PAHs;
- PCBs were detected in about 77 percent of the samples, and one sample exceeded the SQS; and
- Over 65 percent of the samples exceeded the SQS for BEHP.

Until specific data for the 1st Avenue S Bridge storm drain basin are available, the broader dataset for storm drain solids is assumed to generally represent the character of stormwater in the 1st Avenue S Bridge storm drain. Stormwater collected from the Bridge storm drain basin passes through a biofiltration swale before discharging to the river, but information on the swale's treatment effectiveness is not available. Thus, based on the broader dataset for city storm drain solids, there is a potential for sediment recontamination associated with this outfall.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the 1st Avenue S Bridge outfall was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- Ecology will assess the effectiveness of the vegetated swale in treating stormwater discharged from the 1st Avenue S Bridge storm drain (Outfall 2503).
- SPU and/or Ecology will conduct business inspections at properties with stormwater drainage to the 1st Avenue S Bridge outfall, including Seattle Truck Repair, Evergreen Tractor, and the former Taco Time parcel, to verify that these facilities are in compliance with applicable regulations/code and have implemented appropriate stormwater best management practices (BMPs) to minimize the potential for contaminants to enter the storm drain system.

3.1.2 Michigan Street CSO

The Michigan Street CSO basin covers approximately 1,900 acres, spanning west-to-east from the LDW to Beacon Avenue S and north-to-south from S Bradford Street (approximately two blocks south of S Spokane Street) to S Norfolk Street (Figure 6). Land uses within the CSO basin include industrial, residential, and commercial properties and the King County International Airport. Parts of the Michigan Street CSO basin overlap with the Brandon Street and East Marginal CSOs. In areas where the CSO basins overlap, wastewater and stormwater within the Michigan Street CSO basin may be redirected to the Brandon Street or East Marginal outfalls depending on the route that the combined wastewater and stormwater takes through the County conveyance system.

From 2000 to 2007, combined wastewater and stormwater overflows were discharged through the Michigan Street CSO on average 11 times per year, with an annual average volume of approximately 17.6 million gallons per year (mgy). Equipment malfunctions have led to three discharges through the Michigan CSO, in 1992, 2004, and 2006 (Tiffany 2008b).

King County Industrial Waste (KCIW) estimates that industrial discharges comprise less than 0.5 percent of the total volume of a CSO event (Tiffany 2008a). Typically, domestic users of the combined sewer system contribute a larger percentage of the chemical loading than industrial users. For example, KCIW testing has indicated that industrial users of the combined sewer system contribute less than 10 percent of the phthalate load, with the remainder coming from uncontrollable sources such as domestic users.

Based on City of Seattle utility line data (see Figure 5), several sanitary sewer lines in the area between East Marginal Way S and the Michigan Street CSO outfall appear to connect to the combined sewer line. The direction of flow shown on Figure 5 indicates that sanitary sewage in this area is discharged directly to the LDW through the Michigan Street CSO outfall. However, a regulator station located near the CSO outfall contains a weir with an elevation that retains combined wastewater during storm events, unless the combined wastewater is large enough that a CSO discharge event occurs (Tiffany 2009). Under normal conditions, however, sanitary sewer connections between the regulator station near East Marginal Way S and the outfall regulator station discharge wastewater into the Elliott Bay Interceptor (which runs along East Marginal Way S). This occurs because the invert elevation of the sewer line is higher near the outfall regulator station and lower where the line drops into the Elliott Bay Interceptor (Tiffany 2009).

Potential for Future Releases to LDW Sediments

Although COCs from individual industrial and commercial facilities within the CSO basin are significantly diluted, the cumulative effects of CSO events could contribute to recontamination of sediments associated with the Slip 2 to Slip 3 source control area. Industrial and commercial facilities discharging industrial wastes and/or stormwater to the combined sewer system are therefore considered to represent potential but relatively minor sources of sediment recontamination.

Industrial and commercial facilities within the Michigan Street CSO basin have been identified as follows:

- 206 facilities within the Michigan Street CSO basin have been assigned Ecology Facility/Site ID numbers;
- 22 of these facilities are listed on Ecology's Confirmed and Suspected Contaminated Sites List (CSCSL);
- 40 of these facilities have active EPA ID numbers;
- 22 of the facilities hold NPDES permits;
- 14 of these facilities have KCIW discharge authorizations or permits; and
- 77 of these facilities are listed on Ecology's Underground Storage Tank (UST)/Leaking Underground Storage Tank (LUST) lists.

Additional information about these facilities is provided in the Slip 2 to Slip 3 Data Gaps report. Seventy seven of the 206 facilities with Ecology Facility/Site ID numbers are included in a source control area that has previously been evaluated for sediment recontamination potential as part of a Data Gaps report and/or SCAP, and these are not discussed further in this report. Seventeen of the 206 facilities are located within the storm drain basins for Outfall 2503 (1st Avenue S Bridge storm drain) and Outfall 2019 (Slip 2 Outfall), and these are discussed in Sections 3.2 and 3.3 of this SCAP.

Facilities not included in a previous Data Gaps report and/or SCAP, and not identified as adjacent or upland to the Slip 2 to Slip 3 source control area, were identified and discussed in Section 6.0 of the Slip 2 to Slip 3 Data Gaps report. Those facilities that represent a potential for sediment recontamination are identified in Section 3.4 of this SCAP.

Illicit sanitary sewer connections could result in direct discharge of sanitary sewage to the LDW.

Additionally, an unknown number of undocumented industrial operations may take place within the Michigan Street CSO basin. Unregulated industrial activities may be an ongoing although minor source of contaminants to sediments associated with the Slip 2 to Slip 3 source control area.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the Michigan Street CSO was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- King County will provide data regarding contaminant concentrations in Michigan Street CSO discharges.

- SPU will conduct business inspections within the Michigan Street CSO basin to identify undocumented and unregulated industrial operations, if any, that may represent sources of contaminants to LDW sediments.

- Ecology will conduct a stormwater compliance inspection at the King County Airport Staging Yard/Georgetown Yard (6640 Ellis Avenue, Facility/Site ID 3210980); this facility is covered under the Industrial Stormwater General permit; however, no inspection information was identified.

3.1.3 Slip 2 Outfall (Outfall 2019 – Glacier Northwest)

Outfall 2019 is a 24-inch concrete structure located below the bulkhead at the head of Slip 2, on property owned and operated by Glacier Northwest. Storm drain piping associated with this outfall extends across East Marginal Way S to 4th Avenue S (Figure 5).

Based on SPU GIS data, this storm drain collects runoff from approximately 1,000 feet of East Marginal Way S and private properties along the east side of East Marginal Way S, but does not collect stormwater from the Glacier Northwest property. Parcels drained by this outfall are

owned by Michigan Properties, Richard M. Hackett, and Shippers Transport Express. These parcels are identified in Figure 4 as Bank & Office Interiors, Fittings, Inc., and former Consolidated Freightways, respectively. The drainage area is estimated at approximately 10 acres (Schmoyer 2008b).

The Draft Final LDW RI/FS lists Glacier Northwest as the outfall operator (Windward 2008, Appendix H); however, it is unclear whether this outfall is covered under Glacier Northwest's General Sand & Gravel NPDES permit (WAG503191).

Flow (approximately 2 gallons per minute [gpm]) was observed from this outfall during the 2003 SPU outfall survey (Herrera 2004).

Potential for Future Releases to LDW Sediments

No data on contaminant concentrations in stormwater or storm drain solids associated with this storm drain are available. Although Outfall 2019 is located on Glacier Northwest property, it collects and discharges stormwater from industrial operations to the east of East Marginal Way S. One facility within this drainage subbasin, Fittings, Inc., was inspected by SPU in August 2008 and was in compliance with applicable regulations and stormwater BMPs at that time. The other facilities in this subbasin have not been inspected. The potential for future releases to LDW sediments is therefore unknown.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with Outfall 2019 was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- SPU and/or Ecology will conduct business inspections at properties with stormwater drainage to Outfall 2019, including Bank and Office Interiors, Ener-G-Foods, and Shippers Transport Express (former Consolidated Freightways), to verify that these facilities are in compliance with applicable regulations and BMPs to minimize the potential for contaminants to enter the storm drain system.
- Ecology and/or SPU will identify the owner of Outfall 2019, and will evaluate the adequacy of existing NPDES permits with regard to stormwater discharges from this outfall.
- EPA sent a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e) Request for Information letter to Ener-G Foods, Inc. in 2008. Ecology will review the facility's response when it becomes available to determine whether Ener-G Foods, Inc. poses a risk of LDW sediment recontamination.

3.1.4 Glacier Northwest Outfall 2018

Outfall 2018 is an 8-inch polyvinyl chloride (PVC) pipe that extends through the bulkhead near the southwest corner of the Glacier Northwest property (Schmoyer 2008b). According to SPU geographic information systems (GIS) data, this outfall does not appear to be connected to any

storm drain lines. Discharges from this outfall, if any, are covered under Glacier Northwest's General Sand & Gravel Permit (No. WAG503191), which is valid through February 2010 (Ecology 2006f). The potential for future releases to LDW sediments from this outfall is unknown. Source control actions associated with this outfall are identified in Section 3.2.1 (Glacier Northwest).

3.1.5 Outfalls 2021 and 2022 (James Gilmur Property)

Outfall 2021 is a 6-inch PVC pipe outfall located at the northwestern corner of the Duwamish Marine Center on property owned by James Gilmur. This area of Duwamish Marine Center is currently leased to Samson Tug and Barge (see Section 3.2.3). This outfall is not covered under any current NPDES permit. No other information about this outfall was available.

Outfall 2022 is an 8-inch PVC pipe outfall located north of the 1st Avenue S Bridge on a strip of property that is within the parcel boundaries of the Duwamish Waterway, under the jurisdiction of the Port of Seattle. This property is adjacent to and currently used by the Duwamish Marine Center. This outfall is not covered under any current NPDES permit. No other information about this outfall was available.

The potential for future releases to LDW sediments from these outfalls is unknown. Source control actions associated with Outfalls 2021 and 2022 are identified in Section 3.2.3 (Duwamish Marine Center).

3.2 Adjacent Properties

Several facilities are located adjacent to the LDW in the Slip 2 to Slip 3 source control area; information about these facilities relevant to recontamination of LDW sediments was presented in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). Adjacent properties that were identified as potential sources of sediment recontamination or for which insufficient information was available to assess the potential for sediment recontamination are listed below.

Facility	Address	Potential Contaminant Pathways
Glacier Northwest (Duwamish Ready-Mix Concrete Plant)	5975 East Marginal Way S	Direct discharges; spills
Seattle Biodiesel	6335 1st Avenue S	Stormwater; surface runoff; bank erosion
Duwamish Marine Center	16 S Michigan Street	Groundwater; stormwater; spills; bank erosion
Samson Tug and Barge	6365 1st Avenue S	Spills; stormwater
Duwamish Metal Fabricators	16 S Michigan Street	Stormwater
Seattle Department of Transportation (Parcel 2410)	6501 1st Avenue S	Stormwater

These facilities are discussed in more detail in Sections 3.2.1 through 3.2.4 below.

As with many properties along the LDW, there is a portion of land adjacent to the Duwamish Marine Center and Seattle Department of Transportation (DOT) properties that is within the boundaries of the former Commercial Waterway District No. 1, King County (Figure 7). The assets of the Commercial Waterway District were transferred to the Port of Seattle in 1963.

3.2.1 Glacier Northwest, Inc.

Current Operations	Ready-mix concrete plant
Historical Operations	Cement/concrete production
Address	5975 East Marginal Way S
Facility/Site ID	95534411 (Glacier Northwest East Marginal Way)
Chemicals of Concern	None identified
Media Affected	Additional information needed

Glacier Northwest operates its Duwamish Ready-Mix Concrete Plant at 5975 East Marginal Way S, located directly adjacent to Slip 2 (Figure 2); the facility produces and tests ready-mix concrete at this location. Glacier Northwest recently became part of the California Portland Cement Company (CalPortland) family of companies.

Historical Operations

The property has historically been used for ready-mix concrete production. Previous records indicate that Kaiser Cement operated at this property; specific dates of operation and activities are not known (City of Seattle 1985). Prior to December 1999, Glacier Northwest operated under the name Lone Star Northwest (Glacier Northwest 2000).

Current Operations

The Glacier Northwest facility is situated on a bermed concrete pad. Process areas are bordered by water-tight concrete walls or are graded and paved such that all process water is collected within a defined boundary (Glacier Northwest 2006). According to Glacier Northwest, the process area boundary provides physical secondary containment for all products within the process area. Process water is either recycled back into the concrete products or treated using an onsite process water treatment and recycling system, as required under the facility's General Sand & Gravel NPDES permit (WAG503191), prior to discharge to the LDW.

A truck washing station and fueling station are present, and trucks are washed before leaving the yard. Other operations performed at the facility include automotive repairs and concrete, gravel, and dirt hauling and storing (SPU 2006a). Figure 8 presents a plot plan of the Glacier Northwest facility. Chemicals used in concrete processing and laboratory testing, stockpiled materials, used equipment, and equipment and materials awaiting disposal or recycling are stored outdoors (SPU 2006a).

Stormwater is contained within the process area boundary and is conveyed to the process water treatment and recycling system. All catch basins within the process area drain to the process

water treatment and recycling system (Glacier Northwest 2006). Any incidental spills would be contained within this system.

Two USTs are in use at this facility. In 2003, a diesel leak was discovered and cleaned up, and subsequent tank tightness testing detected no leaks (Ecology 2003d). Following the discovery of the leak, a containment system and leak detection sensors were installed (Glacier Northwest 2003).

SPU and KCIW performed a joint inspection of the Glacier Northwest facility in May 2006. The following corrective actions were identified (SPU 2006a):

- Provide a site map showing drainage structures associated with the wash rack and fueling area;
- Place chemicals currently stored outside near the wash rack within secondary containment or move them inside;
- Label all spill material containers; and
- Clean all catch basins on the property.

In response, Glacier Northwest provided a site diagram (not available in the files reviewed by SAIC); constructed a roof over the chemical storage area and placed chemical totes in this area on tote containment structures to capture any incidental leakage; labeled spill material containers; and arranged for a contractor to clean the onsite catch basins every two months (Glacier Northwest 2006; SPU 2006c).

SPU and Ecology performed two follow-up inspections at the Glacier Northwest facility in November 2006 (SPU 2006b; Ecology 2006f). Ecology inspectors noted that during barge offloading operations, gravel spilled from a conveyor belt and into the LDW. Glacier Northwest planned to construct a new conveyor and bridge to address this issue. Scrap metal and engine parts, possibly containing fluids and oils, were stored along the upper bank of the LDW outside the cement containment wall. Old containers were used to collect stormwater. Ecology directed Glacier Northwest to store the scrap metal and engine parts in a contained, impervious area and to close the open containers and dispose of them or store them under cover (Ecology 2006f). No information on additional follow-up inspections was identified.

In 2007, Glacier Northwest applied for a U.S. Army Corps of Engineers permit and Ecology Water Quality Certification and/or Coastal Zone Management Consistency Concurrence to replace and reconfigure the deteriorating gantry, bridge, and conveyor system (USACE and Ecology 2007). The project would result in a net overwater coverage increase of approximately 650 sq ft. A public notice was issued on June 1, 2007; it is not known whether this project was implemented.

In 2008, EPA sent CERCLA Section 107(e) General Notice and Section 104(e) Request for Information letters to Glacier Northwest, Inc. Additional information on current operations at the Glacier Northwest property is available in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Environmental Investigations and Cleanups

Two environmental investigations have been conducted at Glacier Northwest. A summary of these investigations/cleanups is listed below. Details are provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[5]
2003	Phase II Soil and Groundwater Investigation (G-Logics 2003a)	Diesel leak discovered 3/5/2003; 3 cubic yards of petroleum-contaminated soil was removed. Six borings were installed around perimeter of fuel dispenser/tank area; soil and groundwater samples tested for benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE). All were non-detected.	None
2003	Remedial Excavation (G-Logics 2003b)	An additional 2 cubic yards of petroleum-impacted soil were removed from the diesel fuel dispenser area in June 2003. All soils with petroleum hydrocarbon concentrations above Model Toxics Control Act (MTCA) soil cleanup levels were removed.	None

Potential for Sediment Recontamination

Petroleum hydrocarbon contamination of soil has occurred at this property; however, remedial actions were conducted to remove affected soils. Therefore, soil and groundwater do not pose a risk of recontamination of sediments associated with the Slip 2 to Slip 3 source control area.

Insufficient information is available to determine whether Glacier Northwest is a source of COCs via stormwater discharge. There are two, possibly four, private outfalls located on the Glacier Northwest property. Based on inspection reports from Ecology, it appears that Glacier Northwest discharges process water and stormwater to the LDW only if the capacity of the facility's process water treatment and recycling system is exceeded. The potential for sediment recontamination via this pathway depends on the status of the outfalls, the frequency of discharges, and the contaminant concentrations in discharges originating from this property.

Outfall 2018 is an 8-inch PVC pipe that extends through the bulkhead near the southwest corner of the Glacier Northwest property (Schmoyer 2008b). Outfall 2018 does not appear to be connected to any storm drain lines; however, no maps showing the layout and design of piping associated with the process water treatment and recycling system on the Glacier Northwest property were available for review.

Based on SPU maps, Outfall 2019, located at the head of Slip 2, is connected to storm drain lines that originate on properties to the east, which are upland of Slip 2. It drains an area that includes a portion of East Marginal Way S, the Bank & Office Interiors facility, and the Fittings, Inc. facility. Ownership of this storm drain and outfall is unclear.

[5] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

A trench drain reportedly discharges to Slip 2 at the northeast corner of the shop building, which is located at the mouth of the slip. The outfall for the trench drain was not identified during SPU's 2003 outfall survey.

Based on SPU maps, an approximately 375-foot-long storm drain line (possibly the above-mentioned trench drain) running from the head of Slip 2 along the southern shoreline of the Glacier Northwest property may discharge stormwater from Glacier Northwest to Slip 2.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at Glacier Northwest was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- Ecology will conduct a follow-up source control inspection at this facility to verify compliance with its previous recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.
- Ecology will request additional information from Glacier Northwest regarding the process water treatment and recycling system at the facility, including the capacity of the system and the frequency and volume of discharges to the LDW.
- If relatively frequent discharges to the LDW from the process water treatment and recycling system occur, then Ecology and/or SPU will collect catch basin solids samples and/or effluent discharge samples from the system to determine if COCs in the discharge may be a source of sediment recontamination.
- Ecology will request additional information from Glacier Northwest regarding (a) the trench drain installed at Glacier Northwest in 1985 and whether it drains to the LDW; (b) the storm drain line shown on SPU maps that appears to discharge to Slip 2 approximately half-way between the head and mouth of the slip; (c) connections to Outfall 2018, if any; and (d) ownership of Outfall 2019.
- Ecology will review information submitted by Glacier Northwest in response to EPA's CERCLA Section 104(e) Request for Information.

3.2.2 Seattle Biodiesel

Current Operations	Research and development of biofuels
Historical Operations	Biodiesel refinery
Address	6335 1st Avenue S
Facility/Site ID	5023482 (Seattle Biodiesel LLC)
Chemicals of Concern	Glycerin, methanol, vegetable oil
Media Affected	Surface water

Seattle Biodiesel operates in the north end of the warehouse on Tax Parcel 4505 (Figure 7). Various other businesses currently operate in the remainder of the warehouse, none of which have been issued Ecology Facility/Site ID numbers.

Seattle Biodiesel was founded in 2004, and operated the region's first commercial-scale biodiesel refinery beginning in early 2005. Biodiesel, refined using virgin vegetable oil, was sold directly to fuel distributors (Ecology 2007e). Glycerin, a byproduct from the biodiesel refining process, was packaged into 275-gallon totes for sale to interested parties. The refinery had a capacity of 5 million gallons per year and operated until late 2007.

The facility has since transitioned to a research and development facility focused on identifying and commercializing next generation biofuels (Imperium Renewables 2009). Seattle Biodiesel is a wholly-owned subsidiary of Imperium Renewables (Ecology 2007e).

Historical Operations

This parcel was previously part of the Lone Star Northwest (now Glacier Northwest) facility; it is currently owned by Lone Star Investors LP.

AR Torrico Sons Shipping operated at 6335 1st Avenue S. Activities included arranging for the transportation of freight and cargo, serving as a shipping agent, and exporting lumber. The EPA ID for this facility has been inactive since 1986 (Ecology 2008c). No additional information regarding historical operations was available for review.

Current Operations

While the facility operated as a biodiesel refinery, chemicals used in the biodiesel refining process were stored outdoors in totes without secondary containment, and most processing tanks were located indoors (Ecology 2007e). The facility was a large quantity generator of dangerous waste (over 2,200 pounds per month) (Ecology 2008a). Current activities and material/waste handling and storage practices at the site are unknown.

Ecology records indicate that Seattle Biodiesel notified Ecology of the intent to install a 10,000 gallon UST in March 2006 (Ecology 2006a); however, as documented by an UST addendum, it appears that an 8,000-gallon UST was installed in May 2006 (Department of Licensing 2006).

Stormwater at the Seattle Biodiesel facility has been observed flowing from the chemical tote storage area and loading ramp directly to the LDW. In other areas of the facility, stormwater flows toward the railroad tracks and infiltrates the ground surface. Some stormwater commingles with street run-off (Ecology 2007e). A storm drain catch basin is located near the entrance to the Glacier Northwest facility. Seattle Biodiesel operates under Industrial Stormwater General Permit SO3010447A, obtained in January 2008 in response to an Ecology stormwater compliance inspection.

On July 28, 2007, approximately 793 gallons of a "process mixture" consisting of crude glycerin, methanol, canol methyl esters, sodium methalate, and a small amount of vegetable oil was released from the Seattle Biodiesel facility; approximately 391 gallons reached Slip 2. The spill occurred as the process mixture was transferred from a 6,600-gallon decanter into 300-gallon

totes (Ecology 2008e). A valve on the decanter was left open, releasing the process mixture to the pavement; the mixture then flowed over the driveway and to Slip 2. Approximately 770 gallons of the spilled process mixture were recovered from the ground surface and the slip using skimmers, absorbent booms, and pads, and a "flushing" operation was conducted to remove the process mixture from the gravel and soil at the shoreline (Ecology 2008d).

In November 2007, Ecology performed a stormwater compliance inspection at Seattle Biodiesel. Ecology determined that Seattle Biodiesel was required to apply for coverage under the Industrial Stormwater General Permit. Industrial activities were exposed to stormwater and stormwater was observed to discharge directly to the LDW. Ecology inspectors noted that spills and/or leaks from chemical totes stored outdoors could reach the LDW via stormwater (Ecology 2007e). A catastrophic spill could likely discharge to the LDW.

Ecology issued a Notice of Penalty (No. 6256) in the amount of $20,000 to Imperium Renewables on December 4, 2008, for the July 2007 discharge of the process mixture to Slip 2 (Ecology 2008e).

In 2008, EPA sent CERCLA Section 107(e) General Notice and Section 104(e) Request for Information letters to Lonestar Investors LP (the property owner)..

Environmental Investigations and Cleanups

No records of environmental investigations or cleanups (other than the spill cleanup described above) were identified for this property.

Potential for Sediment Recontamination

Insufficient information is available to determine whether Seattle Biodiesel is a source of COCs that may result in recontamination of sediments associated with the Slip 2 to Slip 3 source control area. The following factors indicate a potential for transport of contaminants from Seattle Biodiesel to the LDW:

- In the past, stormwater was observed to flow from the chemical tote storage area and loading dock to the LDW. Spills or leaks from chemical totes stored outdoors can mingle with stormwater and discharge to the LDW. A catastrophic leak or spill from these totes, such as the one that occurred in July 2007, may reach the LDW. It is not known if Seattle Biodiesel continues to store chemicals outdoors since its conversion to research and development operations in late 2007.
- Based on aerial photos, the entire site appears to be paved, except for a strip of soil along the bank of Slip 2. Therefore, it is unlikely that operations at Seattle Biodiesel have resulted in groundwater contamination. However, soil and/or groundwater contamination have been confirmed at several upland properties (Figure 4); it is possible that COCs in groundwater from these properties may flow to Slip 2 through the Seattle Biodiesel site.
- Soil is present along the banks of Slip 2 in this area. Contaminants in bank soils could be released directly to sediments via erosion.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this property was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will conduct a follow-up source control inspection at Seattle Biodiesel to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW. The following information will be obtained:
    - Facility plans showing the locations of all catch basins and storm drains (if any) are needed to evaluate the potential for contaminant transport to the LDW via surface runoff.
    - Additional catch basins, floor drains, and storm drain lines on the properties (if any) should be located and mapped.
    - Information regarding how hazardous materials or chemicals are stored and used at Seattle Biodiesel is needed to evaluate the potential for spills to reach sediments associated with the Slip 2 to Slip 3 source control area.
    - Information on any containment system(s) present at the site is needed to evaluate the potential for spills to reach sediments associated with the Slip 2 to Slip 3 source control area.
- Ecology will collect additional information regarding chemical concentrations in bank soils. A recent spill of process mixture flowed across the bank soils at this property, and residual contamination may be present.
- Ecology will review information submitted by Lonestar Investors LP in response to EPA's CERCLA Section 104(e) Request for Information.

3.2.3 Duwamish Marine Center

Current Operations	Repair, storage, and maintenance of construction equipment; container storage; vehicle equipment maintenance
Historical Operations	Barge shipping terminal; cargo container manufacturing; construction material assembly; marine railway; cargo loading and unloading
Address	16 S Michigan Street; 6365 1st Avenue S
Facility/Site ID	21945598 (Duwamish Marine Center) 71371939 (Duwamish Marine Center Inc) 1020256 (Samson Tug and Barge)
Chemicals of Concern	Metals (cadmium, copper, lead, mercury, silver, zinc), PCBs, PAHs, pentachlorophenol, benzene, tetrachloroethene, petroleum hydrocarbons
Media Affected	Soil, groundwater

The Duwamish Marine Center occupies six parcels that are adjacent to Slip 2 and a portion of the area between Slip 2 and Slip 3 (Figure 7). In this SCAP, these six parcels are collectively

referred to as the Duwamish Marine Center or as "the property." The parcels are also referred to in some reference documents as the Gilmur/Hale Family Trust Property, and are currently owned by James Gilmur.

Duwamish Marine Center leases portions of the property to other companies. The Duwamish Marine Center is bordered on the north by the Lone Star Investors property, on the east by 1st Avenue S, on the south and west by the LDW, and by Slip 2 to the northwest. Samson Tug and Barge (Samson) operates in the northern portion of the Duwamish Marine Center; Duwamish Metal Fabricators operates on the southern portion of the property. Burgess Enterprises formerly operated in the area now occupied by Samson (Figure 2).

There are three docks at the Duwamish Marine Center, which are known as the north, middle, and south docks (Environmental Associates 2000). An approximately 80-foot-wide strip of land that runs between the docks and the parcel boundaries is owned by the Port of Seattle (Figure 7) (Farallon Consulting 2002). A series of boathouses with moorage for 12 to 15 boats is located along the shoreline near the Duwamish Metal Fabricators facility.

The parcels making up the Duwamish Marine Center property are relatively flat. The property is approximately 10 to 12 feet above mean sea level. The eastern portion of the property appears to consist of native alluvial deposits, while the western portion of the property was filled extensively (Environmental Associates 2000). The fill extends to approximately 16.5 feet below ground surface (bgs) and consists of sand, silt, and gravel with wood, plastic, brick, metal, rubber, concrete riprap, and glass debris (Farallon Consulting 2002).

Groundwater is encountered beneath the property between 9 and 12 feet bgs and generally flows to the west, towards the LDW (The Riley Group, Inc. 2000).

Historical Operations

This property has been used for industrial purposes since the late 1930s. The types of companies operating at these parcels have included a marine shipyard and railyard, a junk dealer, and various construction services companies. A marine railway was located adjacent to the southwestern shoreline of Parcel 4565 from 1940 until the mid-1970s. The railway measured 120 feet by 40 feet. There were two small stove-heated buildings associated with the railway (Farallon Consulting 2002). A list of companies that have operated on the Duwamish Marine Center property are listed in the Slip 2 to Slip 3 Data Gaps report, Appendix E-3 (SAIC 2009).

The Gilmur and Hale families began purchasing lots on Parcels 4565, 3415, and 3447 in the 1970s. Since the 1970s, when the Gilmur and Hale families began purchasing parcels in this area, the facility has supported the following operations:

- Construction material loading terminal (1975–1978),
- Barge loading terminal and cargo container manufacturing (1979–1984),
- Aggregate loading terminal (1985–1989),
- Construction assembly yard and barge shipping terminal (1990–1994), and
- Construction and marine-related material storage yard (1994–present).

From 1990 to 1994, cargo temporarily stored at the Duwamish Marine Center included waste generated under EPA ID No. WAD988504999. The waste was transferred from barges in closed containers and stored at the facility until transfer to an approved disposal facility (Farallon Consulting 2002).

Burgess Enterprises operated at 6361 1st Avenue S. The former Burgess facilities are now occupied by Samson Tug and Barge. Operations at this facility apparently included cleaning and maintenance of air cleaning systems (Ecology 2003b), marketing Smokeeter® products (systems to control airborne contaminants such as dust and smoke), and designing and manufacturing espresso machines and food-vending kiosks (Environmental Associates 2000). Burgess moved to Renton, Washington, in June 2006 (Burgess 2008).

In June 1992, Burgess Enterprises obtained an EPA ID for disposal of 410 pounds of flammable liquid containing toluene and ethyl acetate, 190 pounds of flammable liquid methyl ethyl ketone (MEK, also known as 2-butanone), 290 pounds of waste liquid containing lead, and 450 pounds of solid waste. This was a one-time disposal of waste in advance of UST removal activities (Environmental Associates 2000).

In May 2003, Ecology inspected the Burgess facility in response to a complaint of discharge to the LDW. A tank containing cleaning solution was plumbed to discharge to the LDW and rinse water from washed air cleaning systems was discharging to the LDW. The pH of the rinse water was over 10. Material safety data sheets for the cleaning solution indicated that it should not be discharged to the environment. The facility operator indicated that the cleaning solution tank was drained approximately every 3 months. Ecology explained to the facility operator that the cleaning solution and rinse water were wastewaters that could not be discharged to the LDW. Burgess took actions to legally dispose of the wastewaters and Ecology recommended that the drain line from the tank be cut and capped (Ecology 2003b).

No additional information on historical operations at this location was identified.

Current Operations

As discussed in Section 3.1.4, stormwater is discharged to the LDW via two outfalls located at Duwamish Marine Center (Outfalls 2021 and 2022, Figure 2). Based on a review of available records, it appears that these outfalls are not permitted. No information regarding pipes or catch basins connected to these outfalls was identified.

Duwamish Marine Center operates at 16 S Michigan Street. The company repairs, stores, and maintains equipment used for construction in Alaska. The primary activities performed include welding, sandblasting, and painting. Other companies operating in the Aleutian Island chain also store equipment at the property (Ecology 1994).

According to a 1994 Ecology facility inspection report, two aboveground storage tanks (ASTs) were present at the Duwamish Marine Center facility: one 200-gallon AST containing diesel fuel for facility equipment and one 500-gallon AST containing waste oil that was generated at the facility (Ecology 1994). A 1999 Environmental Audit indicates that the ASTs were located on government-owned land (Environmental Associates 2000). The 200- and 500-gallon ASTs identified in 1994 were not present in 1999; however, two different ASTs were present at the

facility. These ASTs were reportedly removed from the Satsop nuclear power plant. The ASTs had not been used at the power plant (Environmental Associates 2000). No additional information regarding the storage or use of hazardous materials at the Duwamish Marine Center property was available for review.

Current waste streams generated at the Duwamish Marine Center are unknown. Previous wastes generated at the property include spent solvent, sandblast grit, paint wastes, waste oil, and wastes transferred from ships (Ecology 1994). Employees of the Duwamish Marine Center did not know if the wastes were hazardous or not and indicated that all wastes were managed by a facility tenant, South Coast, Inc. (Duwamish Marine Center 1994). In 1994, a petroleum barge maintained by South Coast, Inc. was the primary source of hazardous waste generated at the facility. The barge was relocated to Japan during 1994 (Duwamish Marine Center 1994).

Plans to install storm drain lines on the Duwamish Marine Center property were prepared in August 1985 (Environmental Associates 2000). As of 2002, the stormwater system had apparently not been installed (Farallon Consulting 2002). A 2007 sampling plan mentions that stormwater is discharged to the LDW; however, the accompanying figure (Figure 9) does not indicate the discharge point(s) (Pacific Crest Environmental 2007).

Duwamish Marine Center first sent a Notification of Dangerous Waste Activities to Ecology in March 1992, identifying the facility as a generator of hazardous waste. The waste stream is described as gas and water with benzene (Ecology 1992a).

Ecology inspected the Duwamish Marine Center in February 1994 after receiving a complaint that hazardous wastes were being transported from Canadian ships to Oregon through the facility. The facility general manager stated that non-hazardous waste was transferred from a Canadian ship at the Duwamish Marine Center to Waste Management's facility in Arlington, Oregon, via railway, and that the waste was not accumulated at the Duwamish Marine Center (Ecology 1994). Waste Management provided documentation to Ecology, which stated that the wastes in question were non-hazardous (Duwamish Marine Center 1994).

During the February 1994 inspection, Ecology determined that general housekeeping at the facility was inadequate; Ecology inspectors observed empty containers and spent sandblast grit that were not properly stored or disposed of, and an oil spill or leak was observed on the ground (Ecology 1994). Following the Ecology inspection, Duwamish Marine Center cleaned the facility and stopped receiving wastes transferred from ships (Duwamish Marine Center 1994).

In August 1999, METRO reported to Ecology that two "very large" transformers were stored at the Duwamish Marine Center, along with other questionable items including a burned-out house. Ecology referred the PCB complaint to the EPA in October (Ecology 1999). In 1999, Environmental Associates reported that these transformers were actually electric generator motors (Environmental Associates 2000).

A facility inspection was performed by Ecology in January 2001. The Ecology inspector described the facility housekeeping as generally good and noted two storm drains near the work building. No drains were present within the building. At the time of the inspection the facility was mostly unpaved (Ecology 2001a).

Duwamish Marine Center was placed on the CSCSL in May 2001 due to metals and PCB contamination in soil and petroleum products, volatile organic compounds (VOCs), SVOCs, and PAH contamination in soil and groundwater (Ecology 2001b).

A subsequent soil and groundwater assessment confirmed the presence of contaminants in soil and groundwater. Farallon Consulting (2002) prepared a Site Closure Report documenting the assessment results and recommending that the site be capped, that a stormwater conveyance system be installed, and that deed restrictions be placed on the property. Farallon requested a No Further Action (NFA) determination for the facility (Farallon Consulting 2003a, 2003b); this request was denied by Ecology.

In July 2006, Ecology determined that the remedial actions taken at the property were not sufficient to meet the requirements of MTCA and recommended completion of further remedial actions, including sediment sampling and potential cleanup of the underwater portions of the property (Ecology 2006c). Ecology recently approved a sampling plan for the Duwamish Marine Center (Adams 2008b). The sampling plan includes a 72-hour tidal study, catch basin solids sampling, and groundwater sampling (Pacific Crest Environmental 2007). Prior to approving the sampling plan, Ecology requested that the scope of work also include river bank sampling and installation of at least three deep groundwater monitoring wells along the edge of the property and adjacent to the LDW (Adams 2008a). Work is currently underway.

In 2008, EPA sent CERCLA Section 107(e) General Notice and Section 104(3) Request for Information letters to James Gilmur (the property owner).

Samson Tug and Barge currently operates at 6365 1st Avenue S and leases additional parcels for outdoor storage (SPU 2008c). Samson provides freight hauling services throughout Southeast Alaska. Samson has operated a storage yard at this location for two years (SPU 2008c) and moved its receiving yard to the Duwamish Marine Center in August 2008.

Outdoor activities at Samson include fueling operations; forklift washing and cleaning; truck loading/unloading; diesel storage in an AST with secondary containment; outside portable container storage of wastes; forklift and truck maintenance and repair; and painting/finishing of vehicles, boats, buildings or equipment (SPU 2008c).

Process wastes generated by Samson include antifreeze (100 gallons per year), batteries (6 per year), petroleum/oils (250 gallons per month), and sludges and residues (100 gallons per month). Wastes are containerized and removed from the property by an outside contractor (SPU 2008c).

There are three catch basins on the portion of the property leased by Samson. Two of the catch basins are connected to storm drains. The third catch basin, located in the “wash area” (Parcel 4560) is connected to the sanitary sewer (SPU 2008c).

Samson was inspected by SPU and Ecology on July 28, 2008. Samson is operating without an Industrial Stormwater General Permit (Jeffers 2008b). SPU directed Samson to obtain an NPDES permit for discharge, improve or create spill response procedures, clean the facility’s storm drains and catch basins, properly dispose of waste sludge in a parts washer, and properly label containers (Schmoyer 2008a; SPU 2008d). Additionally, Samson is not registered as a dangerous waste transfer facility (Jeffers 2008b). Housekeeping at the facility was rated as

"good" (SPU 2008c). A follow-up inspection was conducted by SPU in October 2008; the inspection report was not available at the time this SCAP was prepared.

In July 2008, EPA sent CERCLA Section 107(e) General Notice and Section 104(3) Request for Information letters to Samson Tug and Barge.

Duwamish Metal Fabricators and **Annette Island Construction** lease offices in the Duwamish Marine Center warehouse, which is located on Parcel 3635 (Environmental Associates 2000). Outdoor activities at Duwamish Metal Fabricators include fueling operations, truck loading/unloading of liquid or solid materials, and vehicle/equipment maintenance and repair. Diesel fuel is stored in an AST (SPU 2008a).

Stock metal is stored in a paved, outdoor area (SPU 2008a). Process wastes generated by Duwamish Metal Fabricators include batteries (five per year), petroleum/oils (50 gallons per year), and metal. The batteries and petroleum/oils are containerized and removed from the property by an outside contractor (SPU 2008a).

There are three catch basins on the portion of the property leased by Duwamish Metal Fabricators (SPU 2008a).

The facility was inspected by SPU and Ecology on July 23, 2008. The company is operating without an Industrial Stormwater General Permit (Jeffers 2008b). SPU directed Duwamish Metal Fabricators to obtain an NPDES permit for discharge, create spill response procedures, improve spill response materials, properly educate employees, and clean the facility's catch basins (SPU 2008b). SPU re-inspected the facility on October 23, 2008, and found that Duwamish Metal Fabricators had completed the corrective actions (SPU 2008e). However, the status of the facility's NPDES permit is not known.

Environmental Investigations and Cleanups

Several environmental investigations have been conducted at the Duwamish Marine Center. A summary of investigations and cleanups is provided below; details are provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[6]
1991	UST Closure (Environmental Associates 2000)	Removal of 4,000-gallon leaded-gasoline UST owned by Burgess Enterprises; excavation sidewall and bottom samples analyzed for petroleum hydrocarbons and BTEX; all non-detect.	None
1999	Phase I Environmental Audit (Environmental Associates 2000)	Identified potential environmental concerns: fill material from "suspect" sources (including PCB-contaminated dredge material from the LDW); historical operations at the property.	None

[6] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[6]
2000	Preliminary Phase II Subsurface Investigation (The Riley Group 2000)	Excavation of 4 test pits; advancement of 4 soil borings. Soil samples collected from test pits and borings, and grab groundwater samples from 2 borings. Soil samples analyzed for TPH, PCBs, PAHs, priority pollutant and leachable metals, pentachlorophenol. Groundwater samples analyzed for TPH, BTEX, dissolved metals.	**Soil**: Metals (antimony, cadmium, chromium, copper, lead, mercury, silver, zinc), PAHs, PCBs, petroleum hydrocarbons **Groundwater**: Arsenic, benzene, petroleum hydrocarbons
2002	Soil and Groundwater Assessment (Farallon Consulting 2002)	19 soil borings (4 to 12 feet bgs) and 4 groundwater monitoring wells plus 1 upgradient well. Samples analyzed for diesel- and heavy oil-range hydrocarbons, priority pollutant metals, PCBs, PAHs, and pentachlorophenol. Also 4 test pits excavated and sampled for volatile and extractable petroleum hydrocarbons. Approximately 50 cu yds of soil containing lead above the dangerous waste criterion was excavated in the area of the former junk shop.	**Soil**: Metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, zinc), PAHs, PCBs, petroleum hydrocarbons **Groundwater:** Metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, zinc), PAHs, pentachlorophenol, PCBs, tetrachloroethene, petroleum hydrocarbons
2003-2004	Groundwater Monitoring (Farallon Consulting 2004)	Quarterly sampling of well MW-3 for one year. Samples analyzed for PCBs, dissolved copper, total mercury, and diesel- and heavy oil-range hydrocarbons.	**Groundwater:** Mercury, petroleum hydrocarbons

Potential for Sediment Recontamination

Soil and groundwater contamination is present beneath the Duwamish Marine Center; therefore, there is a potential for sediment recontamination via groundwater discharge from this property.

PCBs, PAHs, metals, and petroleum hydrocarbons are present in soil and groundwater. The Slip 2 to Slip 3 Data Gaps report presents sampling results for all chemicals detected in soil and groundwater at this property. The following chemicals were detected in soil at concentrations above soil-to-sediment screening levels[7]:

[7] These screening levels were developed to assist in the identification of upland properties that may pose a potential risk of recontamination of sediments at Slip 4. The screening levels incorporate a number of conservative assumptions, including the absence of contaminant dilution and ample time for contaminant concentrations in soil, sediment, and groundwater to achieve equilibrium. In addition, the screening levels do not address issues of contaminant mass flux from upland to sediments nor do they address the area or volume of sediment that might be affected by upland contaminants. Because of these assumptions and uncertainties, these screening levels are most appropriately used for one-sided comparisons. If contaminant concentrations in upland soil or groundwater are below these screening levels, then it is unlikely that they will lead to exceedance of marine sediment CSLs. However, upland concentrations that exceed these screening levels *may or may not* pose a threat to sediments; additional site-specific information must be considered in order to make such an assessment.

Metals	Cadmium, copper, lead, mercury, silver, zinc
PAHs	2-methylnaphthalene, acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene
PCBs	Aroclor 1254, Aroclor 1260, total PCBs

The highest exceedances of soil-to-sediment screening levels were observed for zinc (an exceedance factor [EF] [8] of 816), lead (EF 179), and total PCBs (EF 151).

In addition, antimony, arsenic, chromium, total PAHs, Aroclor 1242, diesel-range hydrocarbons, and heavy oil-range hydrocarbons exceeded MTCA soil cleanup levels. The highest MTCA exceedance was observed for chromium (EF 142).

The following chemicals were detected in groundwater at concentrations above groundwater-to-sediment screening levels:

Metals	Cadmium, copper, lead, mercury, zinc
PAHs	acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene

The highest groundwater-to-sediment exceedance factors were observed for benzo(k)fluoranthene (EF 448), mercury (EF 270), benzo(g,h,i)perylene (EF 241), indeno(1,2,3-cd)pyrene (EF 206), and lead (EF 162).

In addition, antimony, arsenic, chromium, 1-methylnaphthalene, pentachlorophenol, Aroclor 1242, Aroclor 1254, Aroclor 1260, total PCBs, benzene, tetrachloroethene, diesel-range hydrocarbons, and heavy oil-range hydrocarbons exceeded MTCA groundwater cleanup levels. The highest MTCA exceedance factors were observed for arsenic (EF 3,793) and benzo(a)pyrene (EF 1,083).

Other pathways may also represent a source of COCs to sediments associated with the Slip 2 to Slip 3 source control area; however, insufficient information is available to make this determination. Potential pathways include stormwater discharge, surface runoff/spills, and bank erosion:

- Stormwater from the Duwamish Marine Center discharges to the LDW (Pacific Crest Environmental 2007). The discharge point(s) were not indicated on the maps available during preparation of this SCAP. There are two private outfalls (2021 and 2022) located on the Duwamish Marine Center property. It is not known if the Duwamish Marine Center uses these outfalls. The potential for sediment recontamination via this pathway

[8] An EF indicates the relationship between the concentration of a chemical contaminant and its corresponding soil-to-sediment or groundwater-to-sediment screening level. An EF of 100 means that the chemical was detected at a concentration 100 times higher than the screening level for that chemical.

has not been determined. Data to be collected during compliance sampling will aide in determining the potential for sediment recontamination via this pathway.

- Based on aerial photographs, most of the Duwamish Marine Center appears to be paved, except for the strip of property along the shoreline owned by the Port of Seattle. Insufficient information is available to determine whether the property has a stormwater collection system. Therefore, due to the property's proximity to the LDW, contaminants (if any) suspended in surface runoff have the potential to reach sediments associated with the Slip 2 to Slip 3 source control area.
- Historical operations at the Duwamish Marine Center have included loading and offloading of construction equipment and waste from ships and barges. Samson engages in ship loading and unloading activities. Boat moorage is located along the shoreline on the southern portion of the property. Spills to the LDW may occur at the Duwamish Marine Center; therefore, there is a potential for sediment recontamination via this pathway.
- Soil is present along the banks of the LDW in this area, and contaminants have been detected in soil samples located near the shoreline. Contaminants in bank soils (if any) could be released directly to sediments via erosion.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at Glacier Northwest was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- Ecology and/or SPU will conduct a follow-up source control inspection at the Duwamish Marine Center to verify that they are in compliance with applicable regulations/code and have implemented appropriate stormwater BMPs to prevent the release of contaminants to the LDW. The following information is needed:
    - Assessment of the adequacy of current facility housekeeping practices to prevent discharge of contaminants to the LDW;
    - Current use and storage of hazardous materials or potentially harmful chemicals/wastes;
    - Adequacy of containment systems;
    - Location of drainage features, such as catch basins, floor drains, and storm drain lines;
    - Information on direct discharges (if any) to the LDW;
    - Types of ongoing activities associated with the boathouses/moorage located on the southern portion of the property; and
    - Current facility operations and tenants.
- SPU will conduct a follow-up business inspection of the Samson Tug and Barge facility to verify compliance with corrective actions requested by SPU in July and October 2008. In addition, the following information is needed:

    - Verification that the cleaning solution tank belonging to Burgess Enterprises has been removed, since the company no longer operates at this location.
- SPU and/or Ecology will determine the status of Outfalls 2021 and 2022. If these outfalls and storm drain lines are currently in use, the area drained by the outfalls needs to be determined and an assessment made of the potential for COCs to reach the LDW via this pathway.
- Ecology will verify the status of NPDES permits for Samson Tug and Barge and Duwamish Metal Fabricators.
- Ecology will require the property owner/operator to collect additional soil and groundwater data to evaluate the potential for sediment recontamination via the groundwater discharge pathway. In April 2008, Ecology approved, with conditions, a sampling plan for the Duwamish Marine Center. The data collected during this investigation may be used to evaluate potential pathways for sediment COCs to reach the LDW.
- Ecology will require the property owner/operator to collect data on concentrations of chemical contaminants in river bank soils to assess the potential for sediment recontamination by erosion.
- Ecology will review information submitted by James Gilmur and Samson Tug and Barge in response to EPA's CERCLA Section 104(e) Requests for Information.

3.2.4 Seattle Department of Transportation Parcel

Current Operations	Biofiltration swale for stormwater discharged from Outfall 2503; occasional use for parking and vehicle maintenance
Historical Operations	Unknown
Address	6501 1st Avenue S
Facility/Site ID	None
Chemicals of Concern	None identified
Media Affected	Additional information needed

This property is immediately adjacent to the LDW. It consists of an unpaved, vegetated area, partially covered by the 1st Avenue S Bridge, which serves as a biofiltration swale for stormwater discharged from Outfall 2503 (Figure 5). A biofiltration swale is a vegetated stormwater treatment system that removes pollutants by means of sedimentation, filtration, soil sorption, and/or plant uptake. The swale is partially located on the SDOT parcel. Areas under the bridge are reportedly used by transients and truckers to park vehicles. SPU has been working with the adjacent property owner (Seattle Truck Repair) to prevent employees from parking and maintaining vehicles on the Seattle DOT property (Schmoyer 2008b).

The potential for sediment recontamination associated with this property is unknown. SPU reports that some vehicle maintenance takes place at this property. The types and quantities of equipment and materials used at the property are unknown. There is no information available to determine if soil or groundwater contamination is present at this property. Contaminants in stormwater draining to the swale from Outfall 2503 or spills from other activities (such as

vehicle maintenance) could accumulate in soils and infiltrate to groundwater. These contaminants (if present) could subsequently be discharged to the LDW. Contaminants in soils (if any) along the banks could be released directly to sediments via erosion.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this property was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- SPU will provide documentation on the effectiveness of the biofiltration swale in treating stormwater discharged from Outfall 2503 (see Section 3.1.1).
- SPU will continue discussions with the adjacent property owner to prevent parking and vehicle maintenance on the Seattle DOT property.

3.3 Upland Properties

Several facilities that are not adjacent to the waterway but are located within the Slip 2 to Slip 3 storm drain basin were identified and described in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). Upland properties identified as potential sediment recontamination sources or for which insufficient information was available to assess the potential for sediment recontamination are listed below.

Facility	Address	Potential Contaminant Pathways
Former Frank's Used Cars	6309 East Marginal Way S	Stormwater; groundwater
Bank and Office Interiors	5960 1st Avenue S; 5990 1st Avenue S	Stormwater
Fittings, Inc.	5979 4th Avenue S	Stormwater
Former Consolidated Freightways	6050 East Marginal Way S	Groundwater; stormwater

These facilities are discussed in more detail in Sections 3.3.1 through 3.3.4 below. Because these properties are not adjacent to the LDW, surface runoff, spills directly to the waterway, and bank erosion are not potential sediment recontamination pathways and therefore are not discussed further in this section. Contaminants from upland properties could be transported to the LDW via stormwater and groundwater pathways.[9]

[9] Recent information regarding Capital Industries, an upland facility that is not within the Slip 2 to Slip 3 storm drain basin or within the Michigan Street CSO basin, suggests that a plume of contaminated groundwater associated with this facility may reach the general vicinity of Slip 2 (Jones 2009). The facility is currently conducting site characterization investigations under an Agreed Order with Ecology. Capital Industries is discussed in the SCAP for the RM 1.2 to 1.7 East (Saint Gobain to Glacier Northwest) source control area.

Stormwater from these properties drains to the LDW from the Slip 2 to Slip 3 source control area via two pathways (Figure 5):

- Via catch basins and drainage ditches discharging to Outfall 2503, located near the 1st Avenue S Bridge (Former Frank's Used Cars, Seattle Truck Repair/Evergreen Tractor, former Taco Time);
- Via the storm drain line connected to Outfall 2019, which is located at the head of Slip 2 (Bank and Office Interiors, Fittings, Inc., and a small portion of the former Consolidated Freightways property).

The Slip 2 to Slip 3 Data Gaps report (SAIC 2009) also summarized information about the Seattle Truck Repair/Evergreen Tractor and the former Taco Time properties. Little information about current or historical activities at these parcels was available. Action items pertaining to these facilities are included in Section 3.1.1 (1st Avenue S Bridge Storm Drain).

Soil and/or groundwater contamination has been confirmed at the former Frank's Used Cars property and at the former Consolidated Freightways property. Additional information regarding the contamination is included in the facility-specific sections below.

3.3.1 Former Frank's Used Cars

Current Operations	Vacant lot, billboard
Historical Operations	Automotive services, transmission repair, automobile wrecking
Address	6309 East Marginal Way S
Facility/Site ID	2337
Chemicals of Concern	Metals (arsenic, cadmium, chromium, lead, zinc), PCBs, VOCs (ethylbenzene, toluene, xylenes), petroleum hydrocarbons
Media Affected	Soil

Frank's Used Cars previously operated on this small, triangular-shaped parcel that is located immediately east of the northbound lanes of the 1st Avenue S Bridge. The parcel is bordered by S Front Street to the southeast and East Marginal Way S to the northeast (Figure 10).

This location is currently a vacant lot with a large AK Media advertising billboard located in the center of the property. As-built plans from the 2001 1st Avenue S bridge crossing project show a drainage ditch running along the east side of this property which connects to the 1st Avenue S Bridge storm drain system and discharges to Outfall 2503 (Figure 5) (SPU 2001 as cited in Schmoyer 2008b). Runoff from this parcel most likely enters that ditch. There are no catch basins on the property and no connections to the combined sewer system (Schmoyer 2008b).

Frank's Used Cars is on the CSCSL for confirmed contamination of surface water and soil, and suspected contamination of groundwater, air, and sediments. Contaminants include halogenated organic compounds, petroleum products, and non-halogenated solvents in all media; EPA priority pollutant metals in surface water, soil, groundwater, and sediment; and PCBs in surface

water, soil, and groundwater. According to Ecology's ISIS database, as of December 5, 2007, the facility is awaiting a Site Hazard Assessment (SHA).

Historical Operations

Historically, this site has been occupied by a transmission repair, automobile wrecking, or automotive services business since at least 1950, and possibly earlier (Environmental Associates 1993). Frank's Used Cars most recently operated at this parcel but went out of business in early 1991. Remaining scrap metal and several containers of waste oil and grease were removed in 1991. The last existing structure was demolished prior to January 1993.

In April 1990, a concerned individual notified Ecology of the likelihood of improperly handled hazardous waste and other conditions of concern regarding the Frank's Used Car property (Ecology 1990a). An initial investigation inspection performed in February 1991 revealed that surface water drained from the site through either a storm drain, a combined sewer system, or possibly by overland flow to the LDW (Ecology 1991b). According to owner/operator site information from Ecology, in August of 1991, halogenated organic compounds and non-chlorinated solvents were suspected and priority pollutant metals, PCBs, and petroleum products were confirmed to be present at this location (Ecology 1991h).

An initial site inspection was conducted in February 1991 (after the business closed). Oil was noted "all over property and in puddles on property" (Ecology 1991b). The owner of the property at that time was listed as Frank Lenci (Ecology 1991c). A preliminary environmental study conducted in January 1993 determined that the shallow soils (0 to 3 feet bgs) on the southern portion of the site were contaminated with heavy oil, cadmium, and lead.

Site stabilization was presented by the property owner as a proposed solution for remediation (Environmental Associates 1993). However, because of the site's proximity to the LDW, Ecology did not deem this an acceptable method of cleanup (Bardy 1993). Information reviewed during preparation of the Slip 2 to Slip 3 Data Gaps report did not indicate whether a cleanup was performed at this site.

Environmental Investigations and Cleanups

Two environmental investigations have been conducted at the former Frank's Used Cars property. A summary of these investigations/cleanups is listed below. Details are provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[10]
1991	Initial Environmental Investigation (Ecology 1991d)	Composite soil sample collected during Ecology site inspection	**Soil:** Cadmium, chromium, lead, zinc, PCBs, ethylbenzene, toluene, xylenes, volatile petroleum hydrocarbons
1993	Preliminary Environmental Study	Soil from 9 shallow holes was composited into 3 soil samples; 9 test pits were excavated and 3 additional composite samples collected. Analysis for petroleum hydrocarbons, priority pollutant metals, and PCBs (surface samples only). Concentrations decreased or were nondetectable at depths greater than 3 feet. A groundwater well on the property (unknown origin and ownership) was sampled; petroleum hydrocarbons and metals were not detected.	**Soil:** Arsenic, cadmium, chromium, lead, PCBs

Potential for Sediment Recontamination

Soil contamination exists at shallow depths on this property. Zinc was detected in 1992 at a concentration above the soil-to-sediment screening level. Arsenic, cadmium, chromium, lead, and PCBs exceeded MTCA cleanup levels but did not exceed soil-to-sediment screening levels. A groundwater sample collected in 1992 did not detect petroleum hydrocarbons or priority pollutant metals. It is not known if residual contamination has leached or migrated to deeper soil and groundwater; however, the potential for sediment recontamination via groundwater discharge from this property is believed to be low.

Site visits in 1991–1992 indicated the presence of an oily sheen on puddles and on the surface soil. Surface contamination (if present) could be transported via stormwater to the 1st Avenue S Bridge storm drain system during large storm events.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this property was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- The most recent information on site conditions is over 15 years old. Ecology and/or SPU will conduct a brief site visit to assess current site conditions and determine whether stormwater from this property is a potential source of sediment recontamination.

[10] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

- Ecology will review the current status of cleanup activities at this site and will determine whether residual soil contamination poses a risk of sediment recontamination.

3.3.2 Bank and Office Interiors

Current Operations	Office furnishing warehouse, various other tenants
Historical Operations	No information available
Address	4960 1st Avenue S
Facility/Site ID	63217123 (Bank and Office Interiors); 7307167 (Ener-G Foods, Inc.)
Chemicals of Concern	None identified
Media Affected	No information available

Bank and Office Interiors (BOI) began operations in Seattle in 1934. The company is the largest office furnishings dealer in the Northwest; it provides moving assistance, and refurbishes and refinishes office furniture (BOI 2009). BOI occupies two large warehouses: one located on the east side of Parcel 9067, and the second on Parcel 9075. Loading docks for the warehouse on Parcel 9075 are accessed through a parking area located to the south on Parcel 9076 (Figure 7).

BOI completed a notice of Dangerous Waste Activities application in April 1993. According to this submission, their wastes included acetone, paint, and methylene chloride (Ecology 1993b). No other documentation about waste handling at BOI was available.

Acme Food Sales, Bake Mark, Ener-G Foods, Inc., and Select Fish also operate in the warehouse on Parcel 9067. No additional information regarding these companies was available in the files reviewed during preparation of the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

No environmental investigations or cleanups have been conducted at this property (SAIC 2009). Based on SPU maps, stormwater from this property is conveyed to Outfall 2019, which is located at the head of Slip 2.

In July 2008, EPA sent a CERCLA Section 104(e) Request for Information letter to Ener-G Foods, Inc., one of the tenants in the BOI warehouse.

Potential for Sediment Recontamination

Insufficient information is available to determine whether this property is a potential source of sediment recontamination. Based on SPU maps, stormwater from this property is conveyed to Outfall 2019, which is located at the head of Slip 2. Therefore, contaminants present in stormwater (if any) could be conveyed to sediments in Slip 2.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at BOI was summarized in the Slip 2 to Slip 3 Data Gaps report. The

following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the Slip 2 to Slip 3 source control area:

- Ecology and/or SPU will conduct source control inspections at BOI and other businesses located on Parcels 9067, 9075, and 9076 to assess the potential for sediment recontamination associated with this property, including the locations of catch basins and storm drains, status and location of hazardous materials or potentially harmful chemicals/wastes stored or used at the facilities, and the adequacy of containment systems (if any).
- Ecology will review information submitted by Ener-G Foods in response to EPA's CERCLA Section 104(e) Request for Information.

3.3.3 Fittings, Inc.

Current Operations	Unknown
Historical Operations	No information
Address	5979 4th Avenue S
Facility/Site ID	Not listed
Chemicals of Concern	None identified
Media Affected	No information available

Fittings, Inc. occupies a small parcel within the Slip 2 to Slip 3 source control area, east of the former Consolidated Freightways parcel (Figure 2). This facility is not listed in Ecology's Facility/Site Database. Based on SPU maps, stormwater from this property is conveyed to Outfall 2019, which is located at the head of Slip 2. Fittings, Inc. is included in this SCAP because stormwater runoff discharges to Slip 2 via Outfall 2019. Therefore, contaminants present in stormwater (if any) could be conveyed to the sediments associated with the Slip 2 to Slip 3 source control area via stormwater.

SPU and Ecology inspected Fittings, Inc. on July 17, 2008. SPU directed Fittings, Inc. to improve or create spill response procedures, improve or purchase adequate spill response materials, properly educate employees, clean the facility storm drains, and properly dispose of waste (Schmoyer 2008a). A follow-up inspection was conducted on August 28, 2008, and the facility was determined to be in compliance with stormwater regulations at that time. The full inspection reports were not available for review at the time this SCAP was prepared.

Source Control Actions

- Ecology will determine whether this facility should apply for coverage under the Industrial Stormwater General Permit.

3.3.4 Former Consolidated Freightways

Current Operations	Container storage and trucking (Shippers Transport Express)
Historical Operations	Trucking and freight services (Consolidated Freightways)
Address	6309 East Marginal Way S
Facility/Site ID	2337
Chemicals of Concern	PAHs, VOCs (benzene, ethylbenzene, xylenes), petroleum hydrocarbons, metals (chromium, lead)
Media Affected	Soil, groundwater

The property, located at 6050 East Marginal Way S, is currently owned and operated by Shippers Transport Express. The 13.6-acre parcel is located east of the Glacier Northwest facility, on the east side of 1st Avenue S and East Marginal Way S (see Parcel 4646 on Figure 7). No buildings are currently present on the property.

Consolidated Freightways Seattle participated in Ecology's Voluntary Cleanup Program (VCP) (ID No. NW410), with site cleanup identified in Ecology's ISIS database as completed in February 2000. The site is listed on Ecology's CSCSL, with confirmed soil and groundwater contamination with petroleum products, and suspected contamination of groundwater with non-halogenated solvents and PAHs. Consolidated Freightways is listed as awaiting a Site Hazard Assessment. CF Motorfreight is an alternative name for Consolidated Freightways.

Groundwater is encountered between 7 and 8.5 feet bgs and is tidally influenced. Groundwater flow direction varies, but is generally to the west towards Slip 2 (Blymyer Engineers, Inc. 1988).

Historical Operations

Harper-Owes (1985) conducted a review of waste disposal practices in the LDW area (Harper-Owes 1985). Based on historical aerial photographs, they identified the presence in 1940 of two small dump areas, located on the west side of the former Consolidated Freightways property, just to the east of East Marginal Way S. By 1961, the area was covered by industrial development (Harper-Owes 1985). No additional information regarding solid waste disposal in this area was available.

Consolidated Freightways operated on this property from approximately 1985. Consolidated Freightways Corporation filed for Chapter 11 bankruptcy protection in September 2002, and has been liquidating assets since that time (Consolidated Freightways 2009). Equipment at the Seattle facility was auctioned off in April 2003.

A facility inspection was performed in 1996 by Ecology. The inspector noted that drums containing waste antifreeze were not properly labeled and that Consolidated Freightways had not submitted an annual report for 1995 for its hazardous waste activities (Ecology 1996b).

A 1988 letter to Ecology indicates that five USTs were in use at the property, which included a 1,000-gallon heating oil tank, two 3,000-gallon waste oil tanks, and the two 20,000-gallon diesel

tanks mentioned above. Leak detection testing in 1988 indicated that one of the waste oil tanks and the piping associated with one of the diesel tanks were leaking (Blymyer & Sons Engineers, Inc. 1988b).

In February 1988, Consolidated Freightways reported a leaking UST to Ecology. A 500-gallon motor oil tank on the property failed UST tightness testing. Further investigation revealed that groundwater was flowing into the UST (Cashion 1988). In May 1988, Ecology directed Consolidated Freightways to perform a site assessment and begin soil remediation (Ecology 1988).

In March 1997, Consolidated Freightways reported a leak from one of the 20,000-gallon diesel USTs to Ecology and indicated that soil was contaminated (Ecology 1997b).The UST was connected to two dispensers inside a maintenance shop (Golder Associates 1998). The UST was temporarily closed in July 2003 (Ecology 2003c). In 2005, Emway South LLC notified Ecology that it had purchased the property and taken ownership of the UST (MWK 2005).

Current Operations

Shippers Transport Express provides container storage and trucking services at this facility. No information on waste streams generated at this facility was identified.

Based on SPU maps, it appears that stormwater from the western portion of the facility is conveyed to Outfall 2019, which is located at the head of Slip 2 (Figure 5). Stormwater from the remainder of the property is conveyed to the combined sewer. During CSO events, stormwater and wastewater may be discharged to the Michigan Street CSO.

Environmental Investigations and Cleanups

Several environmental investigations have been conducted at the former Consolidated Freightways property. A summary of these investigations/cleanups is listed below. Details are provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[11]
1988	UST Removal (Blymyer & Sons Engineers, Inc. 1988a; Blymyer Engineers 1988)	Three diesel USTs were removed, including a 500-gallon motor oil tank that had been reported as leaking in February 1988. Soil and groundwater contamination present in excavation.	**Soil:** Petroleum hydrocarbons **Groundwater:** Benzene, xylenes, petroleum hydrocarbons
1988	Phase I Contamination Investigation (Blymyer Engineers, Inc. 1988)	5 wells installed and soil/groundwater samples collected from tank excavation area; 2 waste oil USTs removed. Soil contamination was limited to vadose zone.	**Soil:** Petroleum hydrocarbons **Groundwater:** Chromium, lead, petroleum hydrocarbons

[11] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

Date	Investigation/Cleanup	Description	Chemicals with Elevated Concentrations[12]
1989-1990	Groundwater Monitoring and Well Abandonment (Blymyer Engineers, Inc. 1989; GTI 1990)	Several rounds of groundwater sampling; samples analyzed for TPH, which was not detected. All 5 monitoring wells abandoned in January 1990.	None
1997	Initial Site Investigation (Shannon & Wilson 1997)	10 soil borings advanced around the 2 20,000-gallon diesel USTs; 2 soil samples and 1 groundwater sample collected from each boring.	**Soil:** Diesel-range hydrocarbons **Groundwater:** Diesel-range hydrocarbons
1998	Site Investigation/Risk Assessment (Golder Associates 1998)	Soil samples collected along UST piping; 2 product recovery wells and 3 groundwater monitoring wells were installed and sampled. Potential for offsite migration was not determined.	**Soil:** PAHs, ethylbenzene, xylenes, diesel-range hydrocarbons **Groundwater:** PAHs, benzene, heavy oil-range hydrocarbons
1998	UST Removal (Golder Associates 2000a)	The 2 20,000-gallon diesel USTs were removed; contamination encountered during the excavation; one product recover well destroyed. 12 soil samples and 1 groundwater sample collected from the excavation and stockpiled soils. Samples analyzed for diesel-range hydrocarbons.	**Soil and Groundwater:** Diesel-range hydrocarbons
1999	Comprehensive Groundwater Investigation (Golder Associates 2000a)	Groundwater samples collected from 3 existing monitoring wells and the 1 remaining product recovery well, and from 13 direct-push boring locations. Groundwater contaminant plume extends west and southwest across the property.	**Groundwater:** Benzene, diesel- and heavy-oil range hydrocarbons

Ecology requested confirmation that the contaminant plume does not extend off-property (Ecology 2000d). Consolidated Freightways applied for assistance under Ecology's Voluntary Cleanup Program. Additional sampling, including a site subsurface soil investigation and installation and sampling of three new groundwater monitoring wells was proposed in February and November 2000 (Golder Associates 2000a, 2000b); however, no reports documenting these investigations were found in the files reviewed during preparation of the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). No additional information on environmental investigations or cleanups at this property was available.

Potential for Sediment Recontamination

Historical operations at this property have resulted in contamination of soil and groundwater beneath the facility. The lateral extent of groundwater contamination has not been defined by previous environmental investigations. PAHs (2-methylnaphthalene, acenaphthene, anthracene, fluorene, naphthalene, and phenanthrene) were detected in soil samples at concentrations above

[12] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

soil-to-sediment screening levels. The highest soil-to-sediment exceedance factors were observed for 2-methylnaphthalene (EF 219).

Chromium, lead, and PAHs (2-methylnaphthalene, acenaphthene, anthracene, fluorene, naphthalene, phenanthrene, pyrene) were detected in groundwater at concentrations above groundwater-to-sediment screening levels. The highest groundwater-to-sediment exceedance factors were observed for 2-methylnaphthalene (EF 1,258), naphthalene (EF 467), fluorene (EF 414), lead (EF 146), acenaphthene (EF 140), and phenanthrene (EF 109).

Because metals and PAHs have been detected in soil and/or groundwater above soil-to-sediment and/or groundwater-to-sediment screening levels, there is a risk of sediment recontamination via groundwater discharge associated with this property. However, the distance between this property and the sediments associated with the Slip 2 to Slip 3 source control area serves to mitigate this risk. Additional soil and groundwater sampling was planned to be conducted in 2001; however, no information was available in the files reviewed by SAIC regarding results of additional sampling.

According to SPU maps, stormwater along the western edge of this property drains to Outfall 2019 (Figure 5). No information about activities in this area were available; therefore, the potential for sediment recontamination via the stormwater pathway is unknown.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this property was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology and/or SPU will conduct a site inspection at this property to identify whether activities along the western edge of the property (in the area that drains to Slip 2) could be a source of sediment recontamination via stormwater discharge.
- Additional soil and groundwater sampling were proposed by Consolidated Freightways in 2000. Ecology will locate and review the results of this sampling (if the sampling plans were implemented), and will assess the potential for sediment recontamination from this property via groundwater transport to the LDW.
- Ecology will search for additional information regarding the two dump areas located at this property in 1940, as identified in historical aerial photographs, and will evaluate the potential for sediment recontamination associated with these areas.

3.4 Facilities Within the Michigan Street CSO Basin

Industrial and commercial facilities within the Michigan Street CSO basin have been identified as follows:

- 206 facilities within the Michigan Street CSO basin have been assigned Ecology Facility/Site ID numbers;
- 22 of these facilities are listed on Ecology's CSCSL;

- 40 of these facilities have active EPA ID numbers;
- 22 of the facilities hold NPDES permits;
- 14 of these facilities have KCIW discharge authorizations or permits, allowing them to discharge industrial wastes to the sanitary sewer; and
- 77 of these facilities are listed on Ecology's UST/LUST lists.

Relevant information about these facilities was summarized in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009). Data gaps and source control actions (if any) have been identified previously for many of these facilities (SAIC 2009, Appendix C-2). The following facilities have not been addressed previously and are identified as potential sources of sediment recontamination in this SCAP.[13] Their locations are shown in Figure 11.

Facility	Address	Reason for Inclusion
Philips Services Corporation	734 S Lucile Street; 5000 Denver Avenue S	Listed on CSCSL; groundwater pathway addressed in the RM 1.2 to 1.7 East SCAP (in preparation)
Emerald Tool, Inc.	6332 6th Avenue S	Listed on CSCSL; confirmed soil contamination
Kelly Moore Paint Company	5410 Airport Way S	Listed on CSCSL; confirmed soil and groundwater contamination
Pioneer Porcelain Enamel Company	5531 Airport Way S	Listed on CSCSL; confirmed groundwater contamination
Scougal Rubber Corporation	6239 Corson Avenue S	Listed on CSCSL; confirmed soil and groundwater contamination
Former Sonn Property	950 S Nebraska Street	Listed on CSCSL
Former Unocal Service Station 0907	1121 S Bailey Street; 6201 Ellis Avenue S	Listed on CSCSL; confirmed groundwater contamination
Winters Investment LP/Riveretz's Auto Care/Former Georgetown Gasco/Tesoro	6169 4th Avenue S; 6185 4th Avenue S	Soil contamination associated with petroleum USTs

The Michigan Street CSO serves an area of approximately 1,900 acres. During periods of heavy rainfall, when the combined wastewater and stormwater flow exceeds the system capacity, the excess flow is discharged to the Michigan Street CSO structure (see Section 3.1.2). CSO discharges contain a mixture of wastewater and stormwater, with stormwater generally comprising the majority of the flow. Wastewater may carry concentrations of sediment COCs, particularly from those facilities that are permitted to discharge industrial wastes to the sanitary sewer (Pioneer Porcelain). Chemical residues present in catch basins on these properties or on adjacent roadways may become dissolved and suspended in stormwater. Contaminants suspended in the combined sewer discharge (if any) may be conveyed to the Slip 2 to Slip 3 source control area during a CSO event.

[13] Source control actions for Duwamish Marine Center and the former Consolidated Freightways site are included in Sections 3.3 and 3.4, respectively, of the current SCAP.

Due to the distance between these facilities and the LDW, the potential for sediment recontamination via soil and groundwater is very low. Soil and/or groundwater contamination has been confirmed at Philips Services Corporation, Emerald Tool, Inc., Kelly Moore, Pioneer Porcelain Enamel Company, Scougal Rubber Corporation, the former Sonn Property, and former Unocal Service Station 0907. Contaminated groundwater may infiltrate to the combined sewer system, contributing to potential contaminant loads in the combined sewer discharge. Additional information regarding contamination at these facilities is included in the facility-specific sections below.

Chemical concentrations in the combined sewer discharge are likely to be heavily diluted prior to discharge to the LDW. Therefore, the potential for sediment recontamination via this pathway is likely to be lower than for direct discharges from adjacent facilities and the stormwater drainage basin. However, given the frequency of discharge from the Michigan Street CSO (approximately 11 times per year with an average discharge of 17.6 mgy), the cumulative effects of CSO discharges over an extended period of time could contribute to recontamination of sediments associated with the Slip 2 to Slip 3 source control area.

Information needed to assess the potential for sediment recontamination associated with current or historical operations at each of these facilities was identified in the Slip 2 to Slip 3 Data Gaps report. A site inspection is needed at each of these properties to obtain the following information:

- Information regarding any historical and/or ongoing industrial activities, to verify that these facilities are in compliance with all applicable regulations and BMPs;
- Information on how and where any hazardous materials, chemicals, or hazardous wastes are stored or used at these facilities, to evaluate the potential for spills to commingle with wastewater and stormwater;
- Facility plans showing the locations of floor drains, catch basins, sewer connections, and storm drains (if any), to evaluate the potential for contaminants suspended in wastewater and stormwater (if any) to be transported to the LDW via combined sewer discharges; and
- Information regarding any containment systems at these properties, to evaluate the adequacy of the systems and determine the potential for spills to commingle with wastewater and stormwater.

In addition, information on the materials used to construct storm drain and sanitary sewer lines in this area and the age of the storm drain and sanitary sewer lines would be useful to assess the potential for contaminated groundwater to infiltrate the combined sewer system.

Facility-specific source control actions are provided at the end of each facility section below.

3.4.1 Philips Services Corporation

Current Operations	Unknown
Historical Operations	Hazardous waste storage and treatment
Address	734 S Lucile Street, 5000 Denver Avenue S
Facility/Site ID	47779679
Chemicals of Concern	VOCs, SVOCs, PCBs, metals, cyanide, TPH
Media Affected	Soil and groundwater

Philips Services Corporation (PSC) owns three parcels adjacent to the Union Pacific Railroad in the Georgetown neighborhood of Seattle. Historically PSC stored, transferred, and treated hazardous wastes at this facility. PSC was a permitted RCRA hazardous waste treatment, storage, or disposal facility (TSDF) under 40 CFR 260-299 until December 2002. In December 2002, PSC stopped accepting waste at this facility and began the above-ground closure process. On August 15, 2003, Ecology approved PSC's July 2003 certification of RCRA above-ground closure for the PSC Burlington Georgetown facility (PTC 2003).

According to King County tax records, there are no buildings on these properties. Between 1991 and 1993, the entire facility was capped with concrete and a stormwater management system was installed to ensure complete containment of any future release. A groundwater extraction and treatment system is operating at the property (Geomatrix 2006).

PSC does business in Washington as Burlington Environmental Inc. Alternative names for this facility include Chemical Processors LLC, Chempro, PSC, and Burlington Environmental.

Historical Operations

Historical operations at this property have been primarily industrial since about 1915. Historical records indicate that a wide variety of thinners, solvents, mineral spirits, painting products, cyanide wastes (including a variety of chlorinated solvents), and PCBs have been released at the facility. A portion of the property was used for staining wood shakes and shingles and storing stains, solvents, and wastes (Geomatrix 2006).

Former USTs at the facility were used by Chempro to store materials such as thinners, solvents, and mineral spirits prior to 1970. Burlington Environmental stored solvents, cyanide wastes, and other materials between 1970 and 1987. All USTs have been removed from the facility (Geomatrix 2006).

Oils containing PCBs were also used at the facility and transformers containing PCB oils were temporarily stored on the western portion of the facility from 1970 to 1989 (Geomatrix 2006).

Environmental Investigations and Cleanups

Soil and groundwater contamination is present beneath the facility. Benzene and solvent contamination in groundwater migrated to an aquifer that discharges to the LDW. Extensive environmental investigation activities and remediation activities of the facility are ongoing and

are overseen by EPA and Ecology (USEPA 2002). A barrier wall has been installed to prevent the spread of contamination through groundwater flow (Ecology 2007g). Groundwater behind the treatment wall is extracted, treated, and then discharged to the combined sewer system (Geomatrix 2006). Soil beneath the facility has been contaminated by 1,4-diozane, PCBs, VOCs, SVOCs, metals, and petroleum hydrocarbons. Groundwater has been contaminated with VOCs, SVOCs, PCBs, metals, cyanide, and TPH. Relevant pages from historical documents related to Philips Services Corporation are presented in Appendix C-3.

Groundwater discharge is a sediment recontamination pathway for the RM 1.2 to 1.7 East (St. Gobain to Glacier Northwest) source control area. A comprehensive summary of the environmental investigations and cleanup activities performed to date are included in the Data Gaps report for the RM 1.2 to 1.7 East source control area.

Potential for Sediment Recontamination

PSC is included in this SCAP because contaminated groundwater associated with the PSC facility may become part of combined sewer discharge to the Michigan Street CSO in two ways:

- PSC extracts contaminated groundwater from the subsurface, which is treated and then discharged to the sanitary sewer under KCIW discharge authorization 769. A treatment system failure may result in the release of contaminated groundwater to the combined sewer system.
- Contaminated groundwater may infiltrate the combined sewer system.

Therefore, there is a potential for sediment recontamination associated with combined sewer discharges from this property. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is very low.

Source Control Actions

Additional environmental investigation and cleanup activities are currently being performed at PSC under the direction of EPA and Ecology. For this reason, no facility-specific data gaps regarding soil and groundwater contamination and the potential for contaminated groundwater to infiltrate the combined sewer system have been identified.

3.4.2 Emerald Tool, Inc.

Current Operations	Manufacture, service, and distribution of cutting tools
Historical Operations	And All Electrochrome (activities unknown)
Address	6332 6th Avenue S
Facility/Site ID	2084
Chemicals of Concern	Halogenated and non-halogenated organics, metals, cyanide
Media Affected	Soil

Emerald Tool, Inc. manufactures, services, and distributes cutting tools for woodworking and related industries. The company has been in operation since 1982 (Emerald Tool 2009).

One 16,384 sq ft building, which is used for light industrial manufacturing and was built in 1957, is located on this property. According to Ecology's ISIS database, Emerald Tool, Inc. and And-all Electrochrome have the same facility ID number; it is therefore assumed that And-all Electrochrome is an alternative name for this facility.

Regulatory History

Ecology determined on June 27, 1991, that Emerald Tool was operating as a non-permitted storage facility (Ecology 1991f, 1991g). In a phone call to the company president it was determined that the company had been there for the past five years and had been generating hazardous waste for the last year and a half. Since generation began, 550 gallons of hazardous waste had collected on site with no waste removal. Based on this information, Ecology made the effective date of the Notification of Dangerous Waste Activities form retroactive to January 1, 1990 (Ecology 1991e, 1991g). It was noted that Emerald Tool had generated approximately 300 pounds of alkaline liquid and 1,200 pounds of a hazardous waste liquid containing cadmium, chromium, and silver (Ecology 1991e).

In 1996, the King County Health Department conducted a Site Hazard Assessment for this facility (the facility operator was listed as And-all Electrochrome). A hazard ranking score of 5 was assigned to the facility, where 1 represents the highest relative risk and 5 the lowest (Ecology 1996c; SKCPH 1997).

No additional information regarding Emerald Tool, Inc. or And-all Electrochrome was available in the files reviewed by SAIC.

Environmental Investigations and Cleanups

A Site Hazard Assessment conducted in 1996 confirmed the presence of contamination in soils and catch basins on the property. Halogenated compounds (solvents), non-halogenated compounds (solvents without halogens), EPA priority pollutant metals and cyanide, corrosive wastes, and non-metallic inorganics concentrations exceeded MTCA cleanup levels (Ecology 1997a).

No additional information regarding environmental investigations or cleanups was available in the files reviewed during preparation of the Slip 2 to Slip 3 Data Gaps report.

Potential for Sediment Recontamination

Contaminants present in catch basins may become suspended in wastewater or stormwater and transported to the Slip 2 to Slip 3 source control area during a CSO event via the Michigan Street CSO. Soil contamination beneath the property has been confirmed. No information regarding groundwater contamination (if any) was available in the files reviewed. Contaminants in the soil (if present) may leach into groundwater and infiltrate the combined sewer system.

Therefore, there is a potential for sediment recontamination associated with combined sewer discharges from this property. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control action will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- SPU and/or Ecology will conduct a business inspection of this facility as described in Section 3.4. In addition, SPU and/or Ecology will request information regarding concentrations of sediment COCs in soil and catch basins at this property.

3.4.3 Kelly Moore Paint Company

Current Operations	Manufacture and sale of paint
Historical Operations	Paint manufacture; auto wrecking; gasoline service station
Address	5410 Airport Way S
Facility/Site ID	2163
Chemicals of Concern	Copper, lead, zinc, solvents, petroleum hydrocarbons
Media Affected	Soil, groundwater

Kelly Moore Paint Company manufactures and sells paint for residential and industrial uses, industrial coatings, and specialty paints. The facility is bordered on the north and northeast by railroad lines (SECOR 1997). It was previously known as the Preservative Paint Company.

Historical Operations

The northern portion of the property was first developed in approximately 1908 (SECOR 1997) and used as a coal storage yard (SCS Engineers 1988). Adjacent properties were developed between the early 1900s and 1950s (SECOR 1997). A brick and wood frame building was constructed in 1930 and underwent extensive remodeling in 1945 and again in 1980 (SCS Engineers 1988). Preservative Paint began operating at this location in 1950. The property included an office and storage building, which served as a union hall from at least 1940 to 1987. Preservative Paint utilized the building as offices and a storage building from 1987, when they purchased the site, until July 1997 when it was reportedly demolished (SECOR 1997). Property boundaries changed slightly with the realignment of the S Lucile Street overpass (SCS Engineers 1988).

The southern portion of the property was an auto garage, auto wrecking yard, and/or gasoline service station (SECOR 1997). As a result, there is a possibility of soil contamination associated with fuel and oil spills, lead/acid batteries, lead paint residue, and cleaning solvents (SCS Engineers 1988). No historical records were found indicating that USTs were located on this

portion of the site; however, they may have been present and simply undocumented (SECOR 1997).

Preservative Paint acquired the southern portion of the facility in approximately 1988 (Cairncross & Hempelmann 1997). Preservative Paint manufactured paints and paint-associated products, and was a retail outlet for these products. In 1985 they generated approximately 24 tons per year of spent non-halogenated solvents (Ecology 1985b).

A 1977 memo between METRO and Preservative Paint documents the agreement for Preservative Paint to discontinue discharging latex and solvent paint wastes to the combined sewer system. The company also planned to construct a barrier with a catch basin (no outlet) to retain any spillage from a solvent tank cleaning (METRO 1977). According to EPA site inspections conducted prior to 1988, Preservative Paint appears to have disposed of hazardous wastes during the course of its operation in a responsible manner and was not considered an evident threat to the environment (SCS Engineers 1988).

Current Operations

Kelly Moore acquired the entire facility in 1994 (Cairncross & Hempelmann 1997). The facility includes a warehouse utilized for the storage of finished paint products, a number of areas that contain mixing and formulating operations, a recovery and recirculation area for bad batches of paint, and an outside storage area that contained both raw materials and drums for waste disposal (USEPA 1986).

According to Ecology's ISIS database, there are nine operational USTs at the facility. Five of these USTs have two compartments, three USTs have a single compartment, and one UST has three compartments. All compartments are used to store hazardous substances.

Stormwater runoff from this site enters the combined sewer system on Airport Way S.

According to a February 1997 Determination of No Significance, the facility consisted of 90 percent impervious surfaces due to the presence of buildings and parking areas (City of Seattle 1997). The large amount of impervious surfaces located at this facility could contribute to the collection of a large volume of stormwater in low-lying areas.

A March 2003 inspection of the facility noted that Preservative Paint/Kelly Moore was in compliance with the stormwater pollutant source control requirements under the City code for discharge to the METRO sanitary sewer. The report also mentioned that roof drains on the very northernmost building discharge to the Diagonal Drainage Basin (SPU 2003) rather than to the Michigan CSO drainage basin as the rest of the facility does.

Ecology issued a notice of penalty to Kelly Moore on April 10, 2006. Violations included operating a UST without a valid license and/or permit, failure to provide required overfill and/or spill protection, and failure to comply with release detection requirements (Ecology 2006b).

Kelly Moore conducted required annual tank testing from 2006 to 2008. All tank lines passed inspection each year (Northwest Tank & Environmental Services 2006, 2007; Northwest Tank 2008). Kelly Moore prepared weekly progress reports regarding UST upgrades for Ecology from

April 14, 2006, to June 26, 2006 (Kelly-Moore 2006a, 2006b, 2006c, 2006d, 2006e, 2006f). These reports outlined efforts to address items including: tank tightness test frequency; release detection test frequency; pressure line automatic leak detector tests; verification of corrosion resistant lines at product fill area; overfill alarm settings; and applicability, exemption, and referrals applying to owners and operators of USTs (Kelly-Moore 2006e).

Preservative Paint/Kelly Moore has a long history of environmental inspections. Violations have included improper labeling of hazardous or dangerous waste, tanks holding dangerous waste which did not meet the tank requirements, inadequate secondary containment, and open/unlabeled containers of waste. Preservative Paint/Kelly Moore has refuted various allegations of non-compliance and/or addressed problems to comply with regulations (Kelly-Moore 2001). The most recent hazardous waste inspection was conducted in November 2007 and several violations were noted (Ecology 2007f). The violations were addressed by Kelly Moore in a January 2008 report (Kelly-Moore 2008).

Environmental Investigations and Cleanups

Several UST removals and environmental investigations have been performed at this facility, as summarized below. Additional information is provided in the Slip 2 to Slip 3 Data Gaps report (SAIC 2009).

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[14]
1985, 1987, 1989	UST Removals	Removal of 10 USTs and installation of 6 new USTs in 1985; groundwater from a UST pit contained copper, lead, zinc. Water was treated in oil/grit separator prior to discharge to sanitary sewer. Two USTs removed in 1987 and 1989.	**Groundwater:** Copper, lead, zinc, petroleum hydrocarbons
1994	Leaking UST Investigation	Tightness tests performed on 10 USTs; all but one passed. Subsurface soil samples collected; toluene present above MTCA Method A soil cleanup levels. Further investigation indicated vapor rather than product leakage; tank repaired.	**Soil:** Toluene
1997	UST Discovery and Removal (SECOR 1997)	UST discovered during foundation removal; mild hydrocarbon-like odor detected but no evidence of soil staining. Analytical results did not indicate MTCA exceedances.	None
1997	UST Removal	Five solvent USTs removed; six additional USTs scheduled for future removal (date unknown).	None
1997	Phase 1 Environmental Assessment (SECOR 1997)	Evaluation of ownership and facility uses to analyze risks. Subsurface soil and groundwater evaluations were ongoing (results not found in files reviewed by SAIC).	None

[14] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[14]
2003	Floor Waste Designation Study (Kelly-Moore 2003)	Rainbow trout bioassay conducted on samples of floor sweepings and floor wash water. Samples not designated as dangerous waste based on bioassay data.	None

Potential for Sediment Recontamination

Because this site is mostly paved, any spills or discharges of chemicals from the facility could be transported to the combined sewer during a storm event.

An extensive historical groundwater study conducted at Chempro, located approximately one tenth mile west of Preservative Paint, has shown that groundwater in the vicinity contains concentrations of heavy metals, as well as other compounds, which exceeded METRO discharge limits (USEPA 1986).

Groundwater from a UST pit revealed high levels of copper, lead, and zinc. METRO stated that groundwater concentrations at these levels suggest a serious contamination problem for this facility (METRO 1985). Subsurface soil samples collected at the facility indicated the presence of toluene at levels exceeding MTCA Method A Cleanup Levels (SECOR 1997).

Therefore, there is a potential for sediment recontamination associated with combined sewer discharges from this property. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will assess the current nature and extent of soil and groundwater contamination associated with this facility to determine the potential for contaminated groundwater to infiltrate the combined sewer system.
- Ecology will determine the current status of cleanup efforts to evaluate whether appropriate actions have been taken or if additional remedial activities are required.

3.4.4 Pioneer Porcelain Enamel Company

Current Operations	Manufacture of enamel products
Historical Operations	Same
Address	5531 Airport Way S
Facility/Site ID	2161
Chemicals of Concern	Metals
Media Affected	Soil

Pioneer Porcelain Enamel Co. is listed in King County tax records as Pioneer Industries, and is referred to in some documents as Pioneer Porcelain Enamel Co. Inc or Pioneer Enamel Manufacturing.

Historical Operations

Pioneer Porcelain Enamel Co. has been in operation since 1925 (Ecology 1991a). No other information on historical operations at this location was identified.

Current Operations

The enamel products produced by this company have historically contained heavy metals including cadmium and lead. Materials used include porcelain pigments containing lead, borax, and soda ash (used in steep preparation and cleanup). As of 1990, there was a sludge discharge sump at this property, and various tanks were present (Ecology 1990c). The company now uses non-hazardous materials in their processes, but the long-term effect and contamination of the property from historical operations is not completely known (Ecology 1991a). An Ecology document indicates that historically this facility has had improper waste management practices (Ecology 1990e). An Environmental Tracking Report indicates spilled wastewater and visible signs of staining on the ground at the facility (Ecology 1989).

This facility has received complaints from METRO (currently, King County) in the past for exceeding permitted levels of cadmium in its discharge into the sanitary sewer (Ecology Undated; 1991a). The company currently holds KCIW discharge permit number 7723, allowing the facility to discharge industrial wastewater to the sanitary sewer.

Pioneer Porcelain Enamel filed a notice of intent for coverage under the Storm Water Baseline General Permit, listing METRO as the storm sewer system operator[15] (Ecology 1992b). This permit was granted in January 1993 (Ecology 1993a). It appears that in 1995, Pioneer Porcelain allowed their permit to lapse (Ecology 1995) but filed a renewal and was issued coverage in January 1996 (Ecology 1996a). Based on a review of Ecology's Water Quality Permit Life Cycle System database, the facility is not currently covered under the Industrial Stormwater General

[15] This appears to be an error on the permit application, because the stormwater drainage system is operated by the City of Seattle.

permit. Since the facility currently discharges stormwater to the combined sewer system, it is likely that coverage under the Industrial Stormwater General permit is not required.

The facility is listed on Ecology's CSCSL, which indicates confirmed contamination of soil and suspected contamination of groundwater and surface water with priority pollutant metals. A Site Hazard Assessment was conducted in 1992 and a ranking of 2 was assigned, with 1 representing the highest relative risk and 5 the lowest (Ecology 1990d).

A health investigation conducted by the Washington Department of Health in 1993 concluded that this facility did not present a significant hazard to public health due to the lack of a human exposure pathway (Department of Health 1993). Ecology's ISIS database currently lists the site with a rank of 4.

Environmental Investigations and Cleanups

Water sampled from an unknown source and location associated with a January 1987 sampling event indicates cadmium was detected at 6.2 mg/L (Ecology 1990c). Soil samples collected outside of the Pioneer factory during a 1990 sampling event revealed heavy metal contamination including cadmium (20 mg/kg), lead (346 mg/kg), and zinc (901 mg/kg). However, the lab report also indicates that lead, nickel, and zinc contamination is consistent with levels found in other areas proximate to railway lines and much higher concentrations could be expected where dumping has occurred (B & P Laboratories 1990).

No other information on environmental investigations or cleanups at this site was identified.

Potential for Sediment Recontamination

The facility has received warnings about exceeding discharge limits of effluent into local sewers (Ecology 1991a). During a CSO event, contaminants from this site may be discharged to the LDW via the Michigan Street CSO.

The surface soil at this facility is known to be contaminated with heavy metals. No available documentation has provided location, depth, or extent of soil contamination and it is unknown whether contamination (if any) extends into groundwater. Contaminants in surface soil could be transported to the combined sewer via erosion and surface runoff, or could leach to groundwater that may then infiltrate into the sewer system and ultimately be discharged to the LDW during a CSO event.

Therefore, there is a potential for sediment recontamination associated with combined sewer discharges from this property. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2

to Slip 3 Data Gaps report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology and/or SPU will conduct a business inspection to assess current activities at the site; verify that storage and use of hazardous materials is consistent with BMPs; identify locations of floor drains, catch basins, sewer connections, and storm drains; and evaluate the adequacy of containment systems.
- Ecology will request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.

3.4.5 Scougal Rubber Corporation

Current Operations	Manufacture of rubber products
Historical Operations	Same
Address	6239 Corson Avenue S
Facility/Site ID	93637295
Chemicals of Concern	Solvents, petroleum hydrocarbons
Media Affected	Soil, groundwater

Scougal Rubber Corporation began operations in 1916 and provides rubber products for industrial services, including automotive, aerospace, construction, manufacturing, and printing/pulp and paper industries (Scougal Rubber 2009). According to the company website, Scougal Rubber molds a variety of elastomers, including natural rubber, neoprene, EPDM, nitrile, urethane, viton, and styrene butadiene, as well as molding and bonding rubber to metal surfaces. Roughly 60 percent of the business involves making rubber bearing pads for bridges (Ecology 1998a).

Current Operations

Painting of adhesives onto steel and Teflon generates wastewater contaminated with MEK, 1,1,1-trichloroethane, and toluene; this is stored in 55-gallon drums and disposed of every four months (Ecology 1985a, 1998b). According to a compliance inspection on July 15, 1998, Scougal Rubber no longer mixes rubber on site, but instead buys a ready-made mix, which they press and cure. In addition, Scougal Rubber conducts sandblasting of steel (Ecology 1998a).

Based on SPU maps, it appears that all stormwater and wastewater from this facility is conveyed to the combined sewer.

According to Ecology's ISIS database, six USTs have been removed from the facility, including five 300-gallon tanks removed in April 1990 (Ecology 1990b). Scougal is on the CSCSL due to confirmed contamination of soil and groundwater by solvents, petroleum products, and non-halogenated solvents.

Ecology performed an inspection at Scougal Rubber on March 27, 2008. During a previous inspection, Ecology had noted several deficiencies, including open containers, lack of container labeling, inadequate waste designation, and improper counting of solvent still wastes. The Ecology inspector confirmed that Scougal Rubber had completed, or was in the process of completing, all corrective actions (Jeffers 2008a). The full inspection report was not available for review.

Environmental Investigations and Cleanups

No information regarding environmental investigations or cleanups at the Scougal Rubber site was available.

Potential for Sediment Recontamination

Soil and groundwater contamination is confirmed at this facility; however, no information regarding the specific contaminants, concentrations, or extent of contamination was available for review. Due to the distance between these facilities and the LDW, the potential for sediment recontamination via soil and groundwater pathways is very low.

The potential for sediment recontamination associated with combined sewer discharges from this property is unknown. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is likely to be very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control action will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.

3.4.6 Former Sonn Property

Current Operations	Unknown
Historical Operations	Material storage, auto wrecking
Address	950 S Nebraska Street
Facility/Site ID	745462
Chemicals of Concern	Metals, petroleum hydrocarbons, PAHs
Media Affected	Soil, groundwater

The former Sonn property consists of two parcels located at 940 S Nebraska Street (Figure 11). Both parcels are currently vacant lots, according to King County tax records. Thomas Sonn sold these parcels to Jules Maes Building LLC in December 2006.

Historical Operations

The former owner of this property, Thomas Sonn, leased the property to Sam Perkins for at least 20 years. Mr. Perkins collected old appliances, auto parts, construction equipment, furniture, empty barrels, and other miscellaneous items for resale. It was not determined if the current property owner continues to lease the property to Mr. Perkins.

Ecology conducted an initial investigation of the former Sonn Property on August 12, 2004, in response to a complaint by the owner of the property across the street. The caller stated that a bootleg auto wrecking operation was being conducted on the property; he mentioned oil stains covering the property and street and expressed concern about potential groundwater contamination (Ecology 2005c). The inspection did not identify any visible soil contamination or staining. Site investigators recommended a No Further Action determination (Ecology 2004b).

The site is listed on Ecology's CSCSL with suspected contamination of soil and surface water with metals, petroleum products, and PAHs, and suspected contamination of groundwater with metals and petroleum products. According to the ISIS database, an initial investigation was conducted on October 2005, and an early notice letter was sent to the property owner/operator in November 2005. No other information was available.

Environmental Investigations and Cleanups

An initial investigation was reportedly conducted at this site in October 2005; however, no information on environmental investigations or cleanups was available.

Potential for Sediment Recontamination

The extent of soil and groundwater contamination (if any) is unknown, and no information regarding the specific contaminants, concentrations, or extent of contamination was available for review. Due to the distance between this property and the LDW, the potential for sediment recontamination via soil and groundwater pathways is very low.

The potential for sediment recontamination associated with combined sewer discharges from this property is unknown. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is likely to be very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control action will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.

3.4.7 Former Unocal Service Station 0907

Current Operations	Distribution of fasteners, tools, and maintenance supplies
Historical Operations	Wood/coal yard, gasoline service station
Address	1121 S Bailey Street; 6201 Ellis Avenue S
Facility/Site ID	2825755 (Unocal SS 0907 ENSR INTNTL)
Chemicals of Concern	Petroleum hydrocarbons
Media Affected	Soil, groundwater

The facility has operated under two addresses: 1121 South Bailey Street and 6201 Ellis Avenue S (Ecology 2005a). The facility is currently occupied by Tacoma Screw Products, Inc., a distributor of fasteners, tools, maintenance and shop supplies for manufacturing, construction, transportation, aerospace, maritime, and agricultural agencies. No additional information regarding current operations at this property was available.

Historical Operations

According to a Kroll Atlas dated 1920, it appears that the north end of the subject property was a wood and coal yard. Initially, the property appears to have been divided into four separate tax lots and combined into the current facility at an unknown time. A gasoline station was present as early as 1930 and located in the northeastern parcel. The pump islands were located in the northeast corner of the parcel, the service station located to the south, and USTs were likely located to the west. The southernmost parcels were initially residential. The fourth parcel remained undeveloped until the current masonry building was erected in 1978 (Environmental Associates 1997). Unocal owned the site from 1935 to 1960 (ENSR International 2005b). The service station operated until 1978 and included a station building with garage, two pump islands, and a kiosk. The garage contained two hydraulic lifts (MFA 2002).

This facility is currently enrolled in the VCP (VCP ID No. NW1374). It is listed on Ecology's CSCSL with confirmed contamination of groundwater with petroleum products and non-halogenated solvents, and suspected contamination of groundwater with halogenated organic compounds. Cleanup status is listed as "complete" as of April 2005.

Environmental Investigations and Cleanups

Several environmental investigations have been performed at this property, as summarized below. Additional information is provided in the Slip 2 to Slip 3 Data Gaps report.

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[16]
1997	Phase 1 Environmental Audit (Environmental Associates 1997)	Audit identified potential concerns: PCBs in light ballasts, asbestos in floor tile, impacts from former gasoline service station on the northern portion of property. No samples collected.	None
2000	Subsurface Investigation (MFA 2002)	Samples collected by GeoEngineers indicated soil contamination between 9.5 and 11.5 feet bgs.	**Soil:** BTEX, petroleum hydrocarbons
2001/2002	Subsurface Investigation (MFA 2002)	Investigation to delineate lateral extent of petroleum-impacted soil and groundwater in northern portion of site. Gasoline-range hydrocarbons exceeded MTCA Method A cleanup levels between 2.7 and 7.5 feet bgs. Additional samples collected in 2002 evaluated upgradient and downgradient petroleum impacts. No detections in offsite wells.	**Soil/Groundwater:** Petroleum hydrocarbons
2002/2003	Soil Remediation (MFA 2003)	Soil vapor extraction system in operation from December 2002 through May 2003, and from July to September 2003.	**Soil:** Petroleum hydrocarbons
2003	Additional Remedial Action and Investigation Activities (MFA 2003)	Evaluation of effectiveness of soil vapor extraction system and delineation of downgradient (western) extent of petroleum-impacted groundwater. Five soil borings completed in areas of previously detected impacts.	**Soil:** Benzene, total xylenes, gasoline-range hydrocarbons
2003-2005, 2007-present	Groundwater Monitoring (ENSR International 2004a, 2004b, 2006; Gettler-Ryan, Inc. 2007, 2008)	Samples collected from 8 groundwater monitoring wells in 2003; gasoline-range hydrocarbons (2 wells) and kerosene (3 wells) near the northern edge of the property exceeded MTCA Method A cleanup levels. Quarterly groundwater monitoring was conducted 1/04 through 4/05. Groundwater monitoring was restarted in 2007 and is believed to be ongoing.	**Groundwater**: Gasoline-range hydrocarbons, kerosene, benzene, arsenic
2005	Voluntary Cleanup Action Review (Ecology 2005b)	Ecology requested removal of an UST discovered during previous site investigation. Because soil and groundwater exceed MTCA cleanup levels, Ecology suggested that groundwater sampling be continued.	None
2005	Supplemental Soil Investigation (ENSR International 2005a)	Nine soil borings were drilled in April 2005 to depths from 2.5 to 11 feet bgs. Petroleum-impacted soils present on the northern side of the property.	**Soil**: Gasoline-range hydrocarbons, BTEX
2005	Soil Vapor Extraction	ENSR submitted application in December	None

[16] Elevated concentrations as defined in this report are those concentrations that exceed a regulatory or screening level.

Date	Investigation/Cleanup	Description	Chemicals with Elevated Conc'ns[16]
	System Expansion (ENSR International 2005b)	2005 to expand the Soil Vapor Extraction system, adding 5 additional vapor extraction wells to the existing system. No additional information was available.	

Potential for Sediment Recontamination

Current operations at Tacoma Screw are unknown. If the facility discharges industrial wastes to the sanitary sewer, these wastes may be discharged to the LDW during a CSO event via the Michigan Street CSO.

Historical activities at the facility have resulted in soil and groundwater contamination with gasoline range hydrocarbon constituents; these contaminated media may infiltrate the combined sewer system and be discharged to the LDW via the combined sewer discharge pathway.

However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is very low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control action will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology and/or SPU will conduct a business inspection to assess current activities at the site; verify that storage and use of hazardous materials is consistent with BMPs; identify locations of floor drains, catch basins, sewer connections, and storm drains; and evaluate the adequacy of containment systems.
- Ecology will request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.

3.4.7.1 Winters Investment LP/Riveretz's Auto Care/Former Georgetown Gasco/Tesoro

Current Operations	Gasoline service station and auto repair facilities; various retail establishments
Historical Operations	Gasoline service station
Address	6185 4th Avenue S
Facility/Site ID	55698119
Chemicals of Concern	Petroleum hydrocarbons
Media Affected	

Businesses operating on the property include McDonalds, Nate's Paintball, International Prospect and Supply, Stalk Market Seattle, Farmers Insurance, a bead shop, and Riveretz's Auto Care, which is also known as Georgetown Gasco/Tesoro. No additional information regarding Winters Investment LP was available.

In 2003, Georgetown Gasco was cited by Ecology for failure to implement leak detection checks for three USTs and failure to perform periodic corrosion checks at the property (Ecology 2003a). Two 6,000-gallon USTs and one 8,000-gallon UST passed inspections performed by Ecology in September 2006 (Ecology 2006d).

Environmental Investigations and Cleanups

Ecology directed Darleen Riveretz of Georgetown Gasco/Riveretz's Auto Care to cap and secure a waste oil UST that was no longer in use and to complete UST removal activities and site assessment by October 2007 (Ecology 2006e). In April 2007, Georgetown Gasco's contractor sent Ecology a 30-day notice of UST removal for one 500-gallon waste oil UST and one 500-gallon heating oil UST (Ecology 2007a). The USTs were removed in May 2007 and soil contamination was discovered during the UST removal activities (Ecology 2007c, 2007d). A second excavation was performed to remove contaminated soils. Gasoline-range hydrocarbons and benzene concentrations in one sample and diesel- and heavy oil-range hydrocarbons in another sample exceeded MTCA Method A cleanup levels. Groundwater was not encountered in the excavation (Earth Consulting Incorporated 2007).

Potential for Sediment Recontamination

Historical activities at the facility have resulted in soil and groundwater contamination beneath the property. Therefore, there is a potential for sediment recontamination associated with combined sewer discharges from this property. However, because combined sewer discharges are significantly diluted prior to discharge, the potential that contaminants from this property will impact sediments associated with the Slip 2 to Slip 3 source control area is low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations via the combined sewer discharge pathway was summarized in the Slip 2 to Slip 3 Data Gaps report. The following source control action will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.

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4.0 Monitoring

Monitoring efforts by SPU, Ecology, King County, and the Puget Sound Clean Air Agency (PSCAA) will continue to assist in identifying and tracing ongoing sources of COCs present in LDW sediments or in upland media. This information will be used to focus source control efforts on specific problem areas within the Slip 2 to Slip 3 source control area and to track the progress of the source control program. The following types of samples will be collected:

- In-line sediment trap samples from storm drain systems,
- Onsite catch basin sediment samples, and
- Soil and groundwater samples as necessary.

If monitoring data indicate the presence of additional sources that could result in recontamination of sediments associated with the Slip 2 to Slip 3 source control area, then Ecology will identify source control activities as appropriate.

Because source control is an iterative process, monitoring is necessary to identify trends in concentrations of COCs. Monitoring is anticipated to continue for some years. Any decisions to discontinue monitoring will be made jointly by Ecology and EPA, based on the best available information. At this time, Ecology plans to review the progress and data associated with source control action items for each SCAP at least annually, and to summarize this information in the LDW Source Control Status Reports, which are scheduled for publication twice a year. In addition, Ecology may prepare Technical Memoranda to update the Data Gaps reports and SCAPs, as needed.

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5.0 Tracking and Reporting of Source Control Activities

Ecology is the lead for tracking, documenting, and reporting the status of source control to EPA and the public. Each agency involved in source control will document its source control activities and provide regular updates to Ecology. Ecology will prepare semiannual LDW Source Control Status Reports that summarize recent activities for each source control area and the overall status of source control in the LDW.

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Figures

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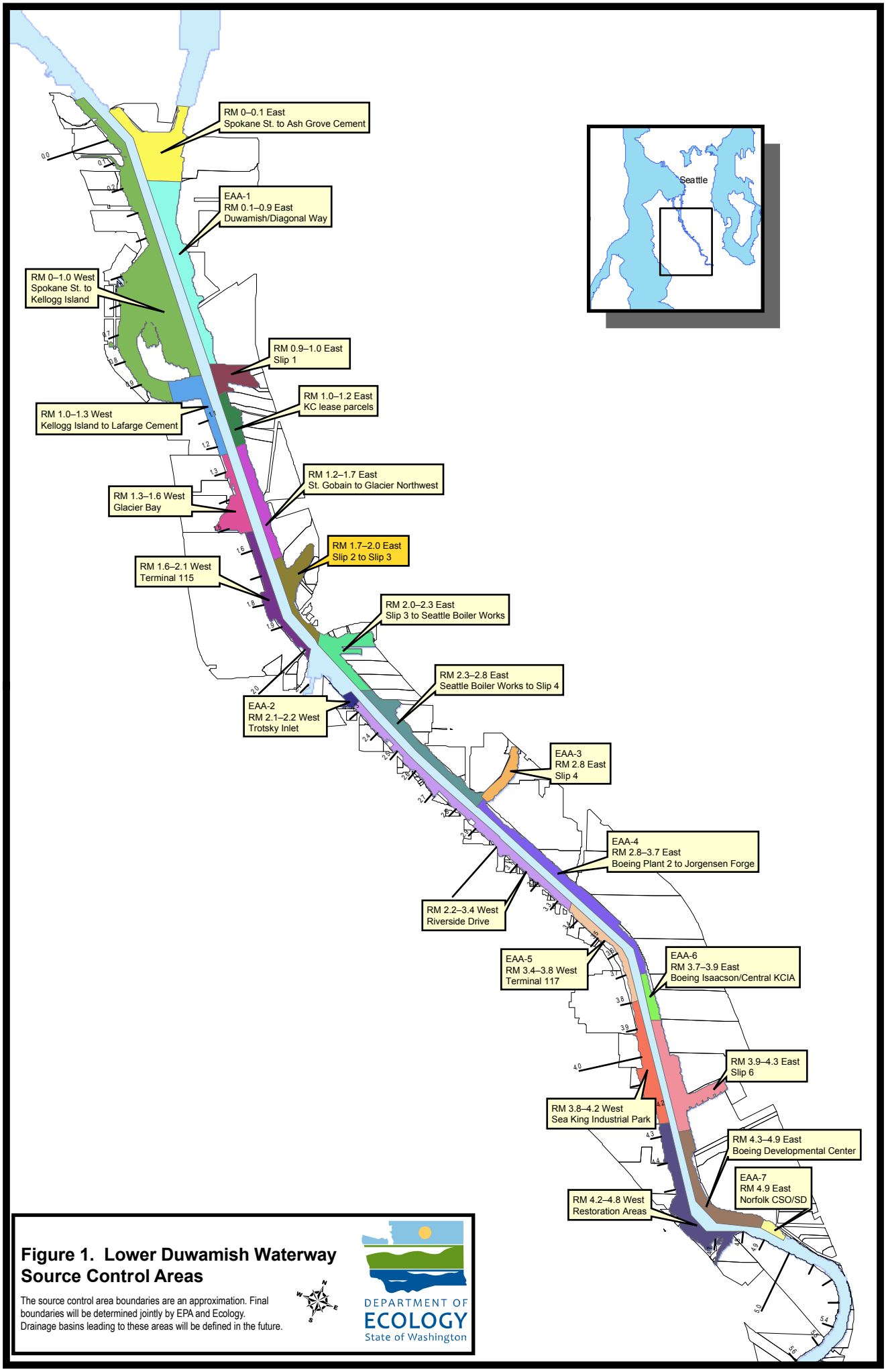

Figure 1. Lower Duwamish Waterway Source Control Areas

The source control area boundaries are an approximation. Final boundaries will be determined jointly by EPA and Ecology. Drainage basins leading to these areas will be defined in the future.

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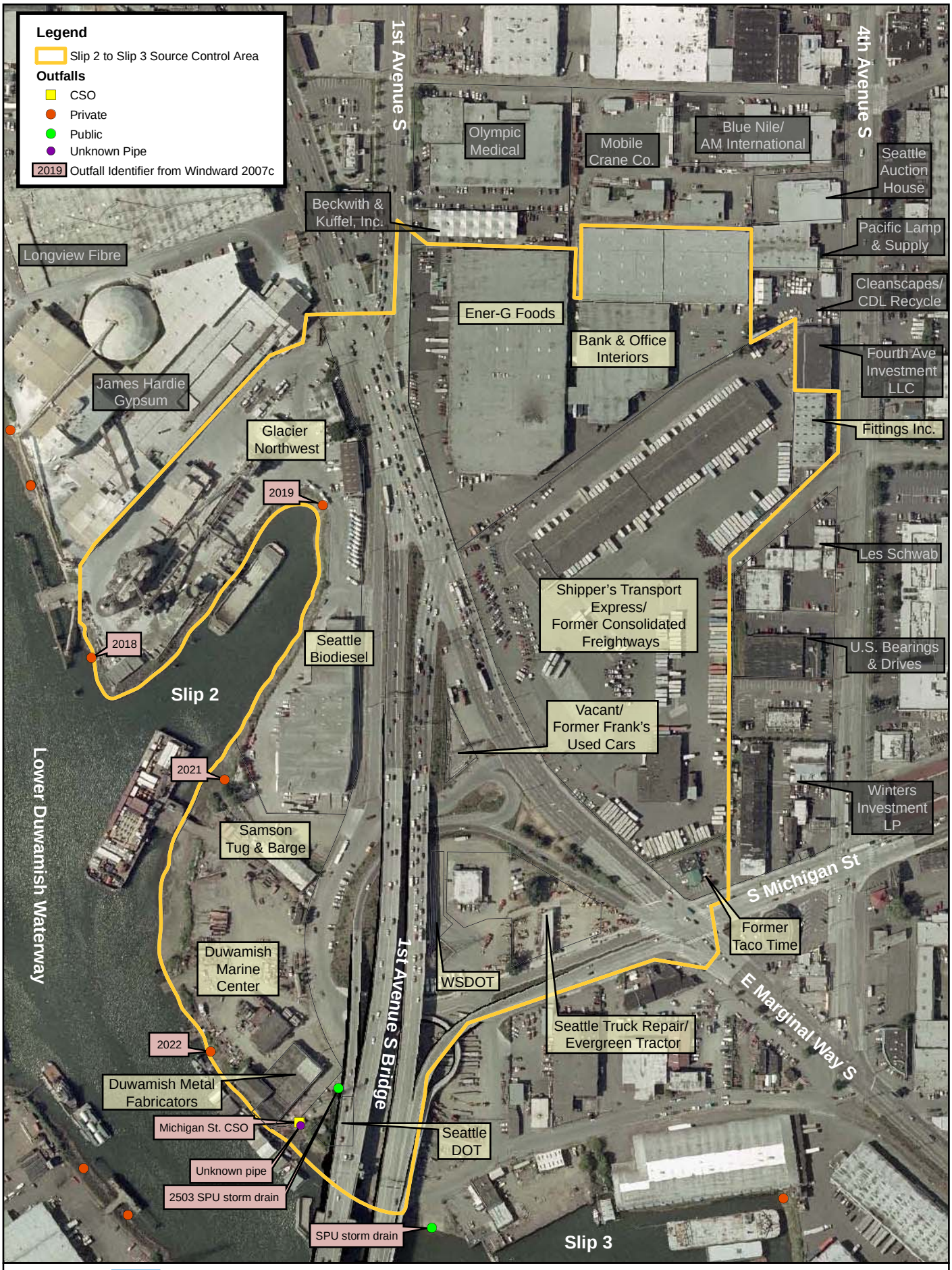

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Figure 2. Slip 2 to Slip 3 Source Control Area

0 125 250 500 750 1,000 Feet

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Figure 3. Sediment and Seep Sample Locations Associated with the Slip 2 to Slip 3 Source Control Area

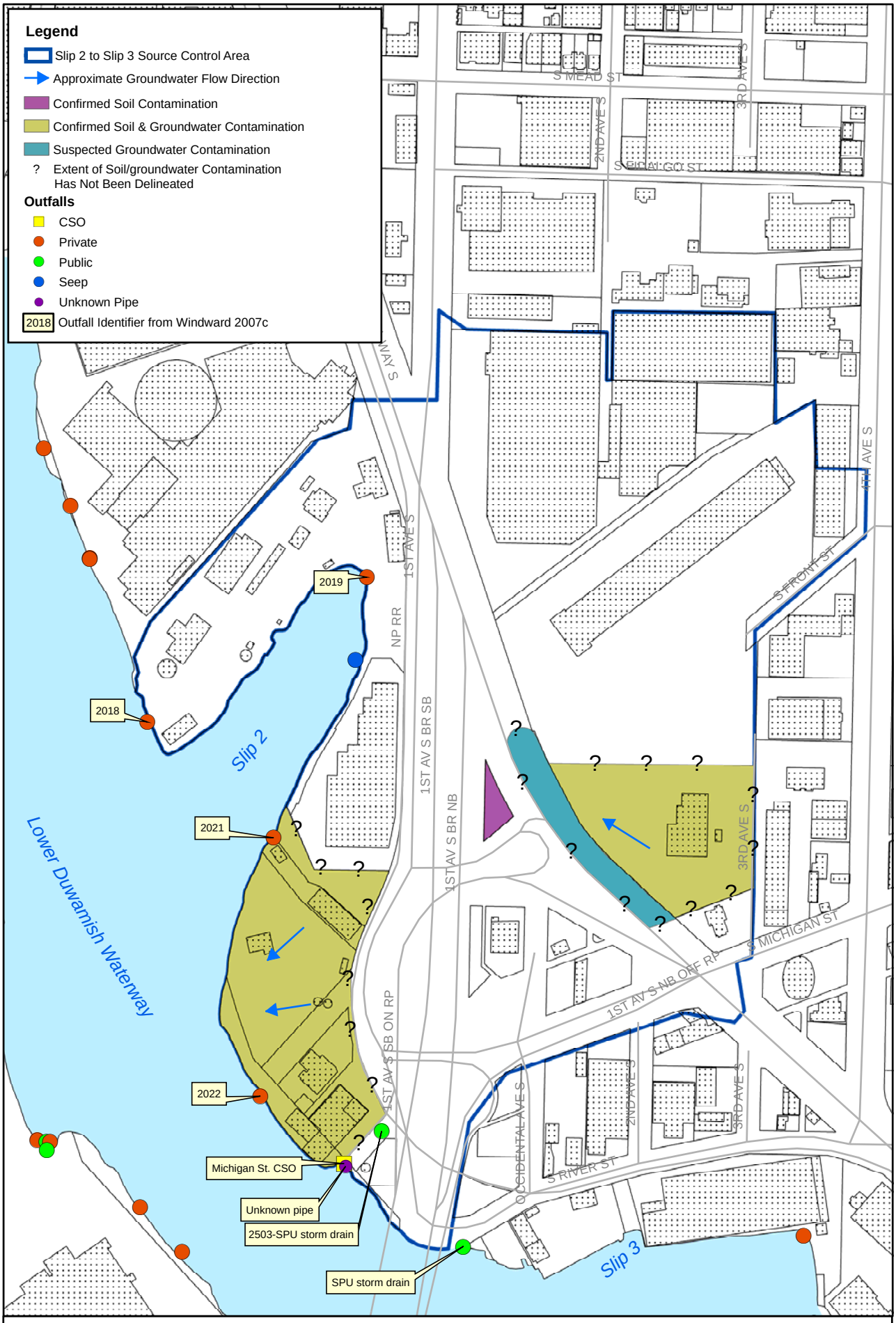

Figure 4. Confirmed or Suspected Areas of Soil and Groundwater Contamination

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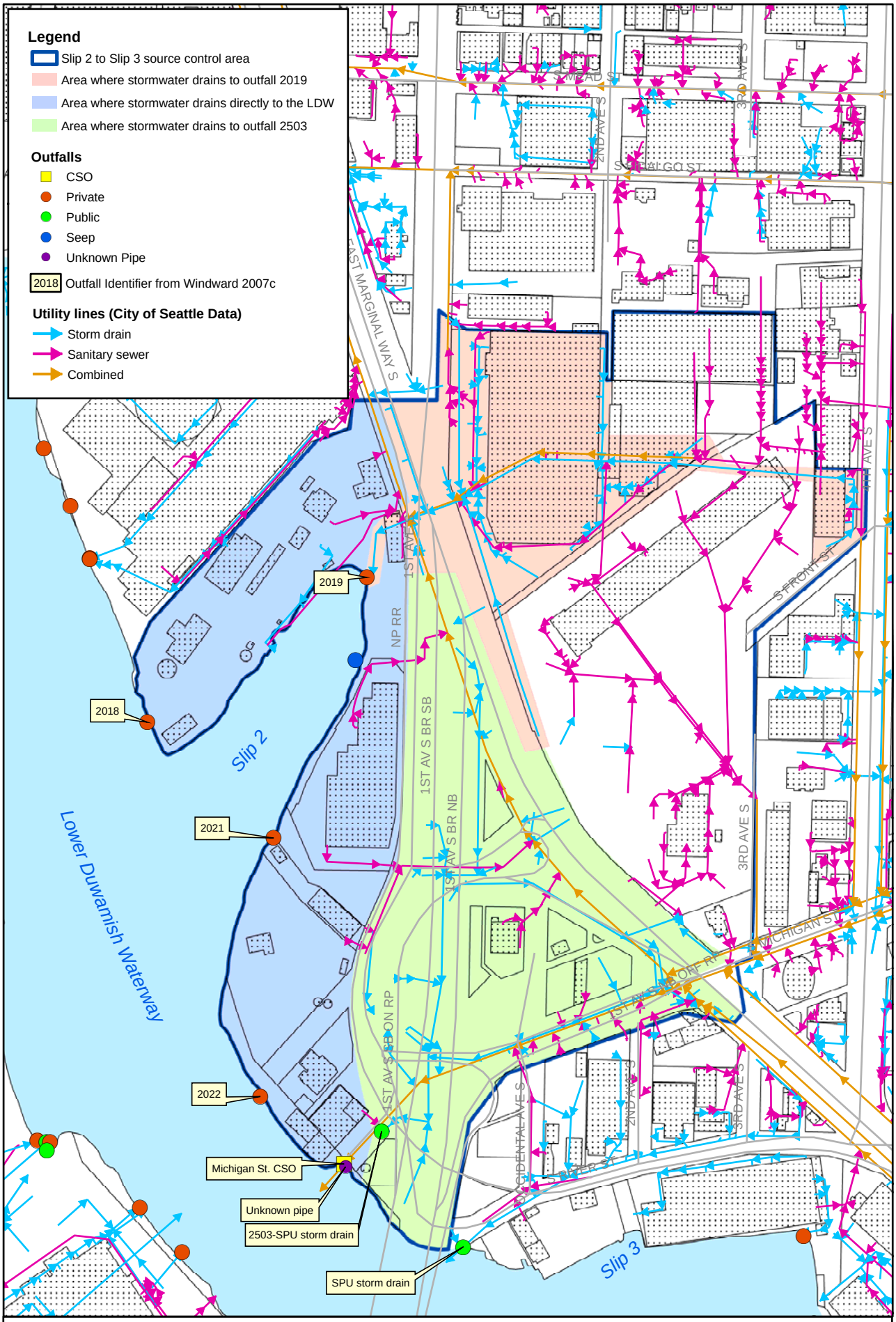

Figure 5. Utility Lines in the Slip 2 to Slip 3 Source Control Area

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0 125 250 500 750 1,000
Feet

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Legend

- Facilities within the Michigan Street CSO Basin with Ecology Facility/Site ID Numbers *
- Slip 2 to Slip 3 Source Control Area
- Michigan Street CSO Basin

*Facility locations are from the Ecology GIS Shape File dated 1/11/09 and downloaded from the Facility/Site Database on 1/12/09. SAIC did not perform an independent review of these data; facility locations as provided in the Ecology GIS Shape File were generally assumed to be accurate.

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Figure 6. Michigan Street CSO Basin

0 1,000 2,000 4,000 Feet

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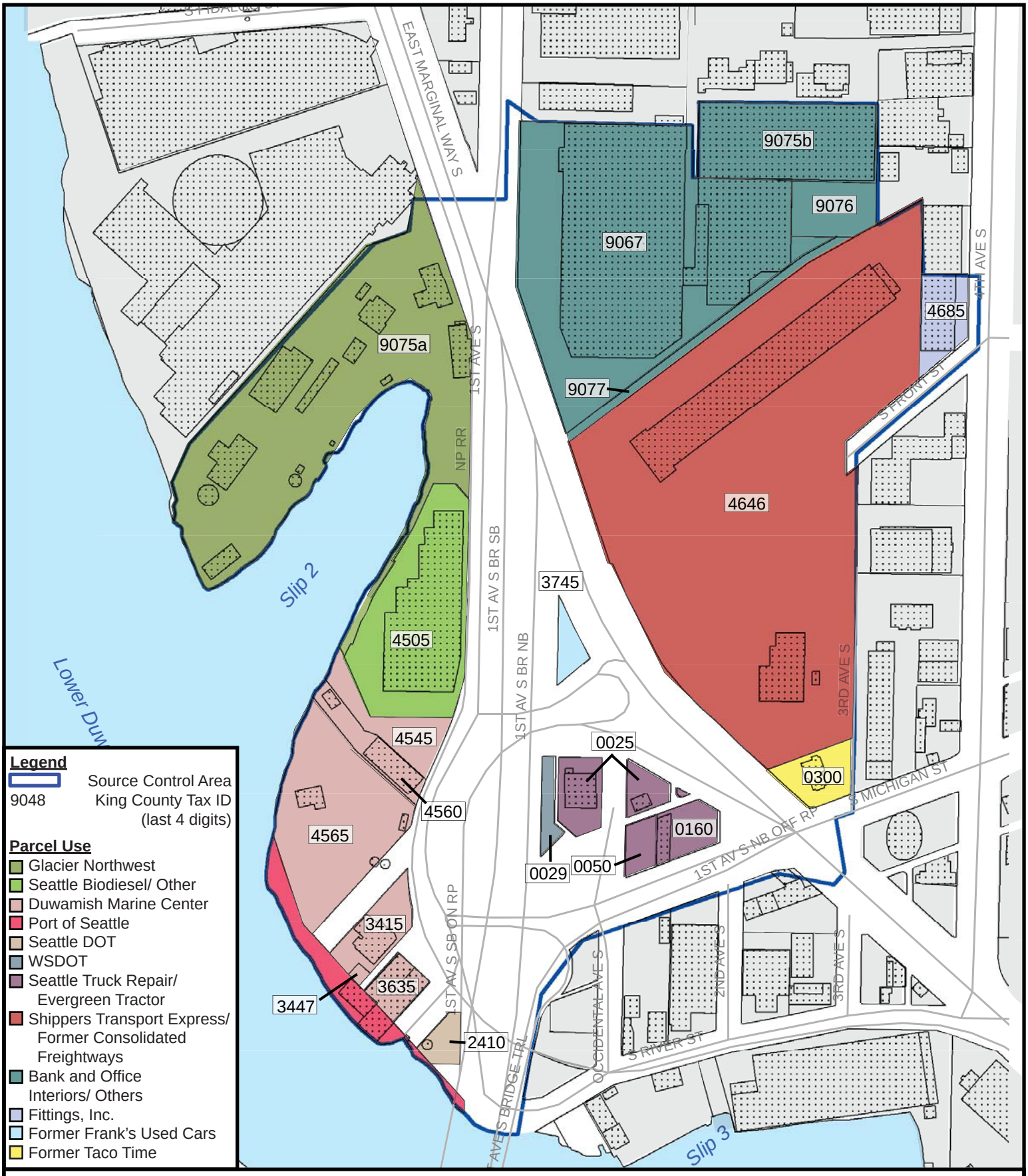

Figure 7. Tax Parcels in the Slip 2 to Slip 3 Source Control Area

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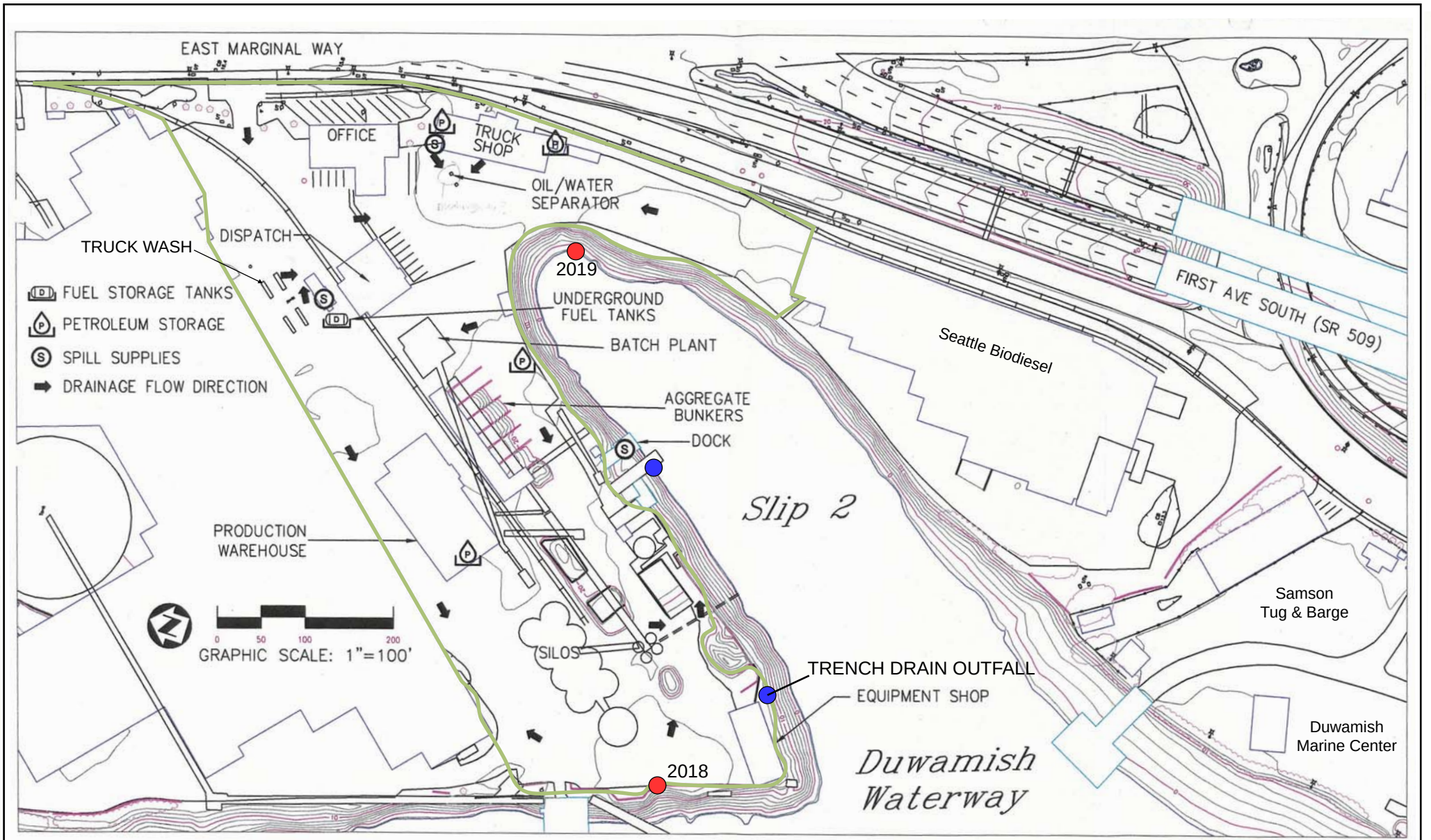

Source: SPU 2006b

Glacier Northwest Facility Boundary (approximate)

Private Outfall

Possible Outfall Location (approximate)

Figure 8. Glacier Northwest Facility Plot Plan

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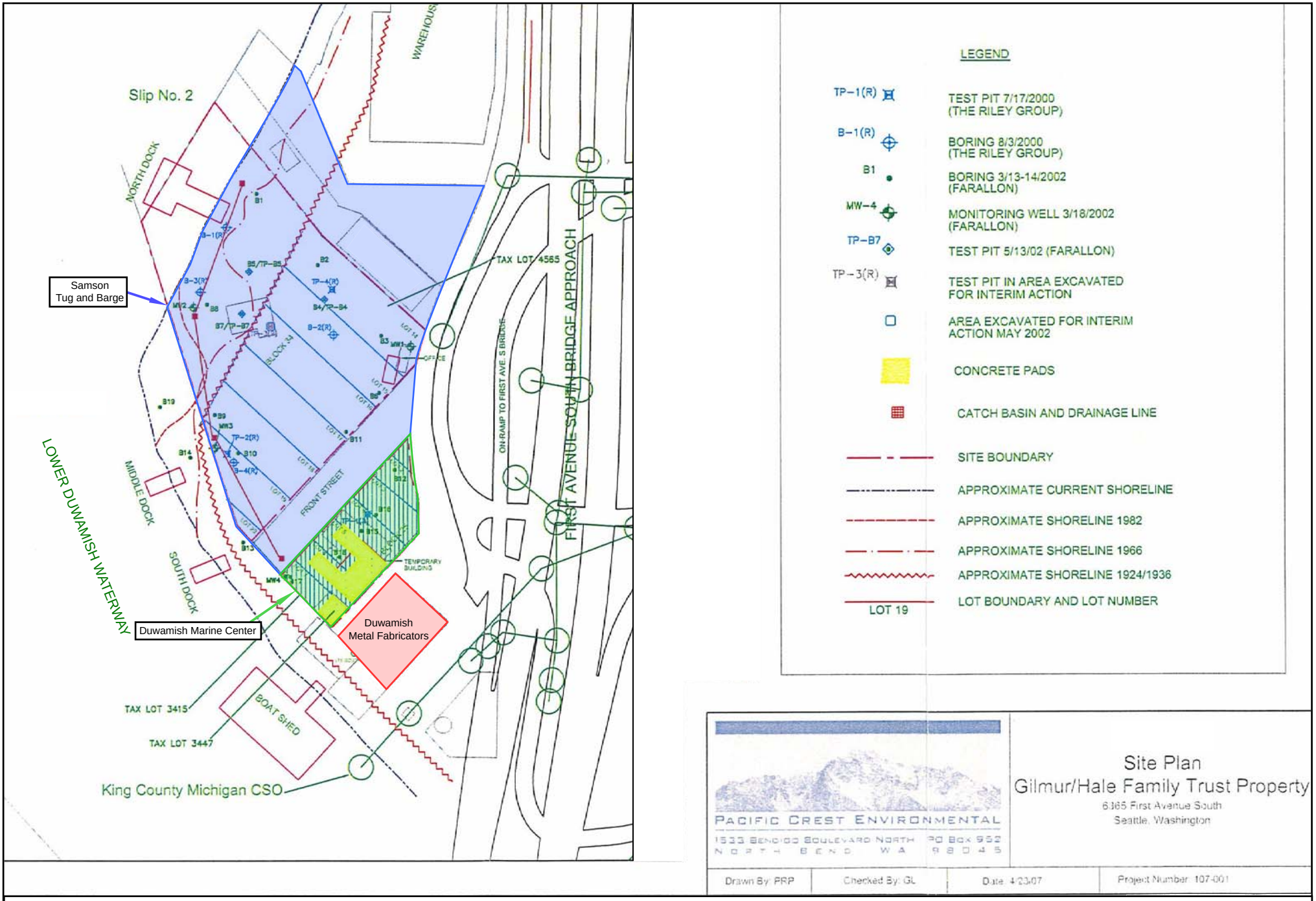

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Figure 9. Duwamish Marine Center Facility Plan

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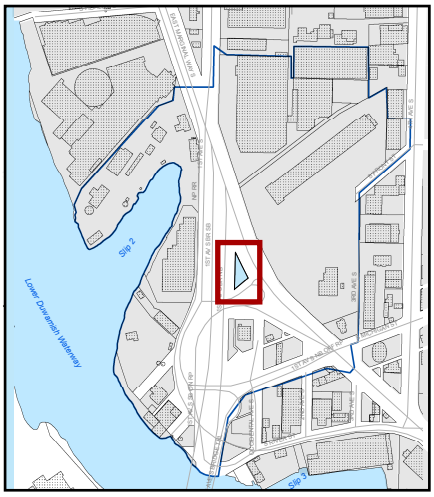
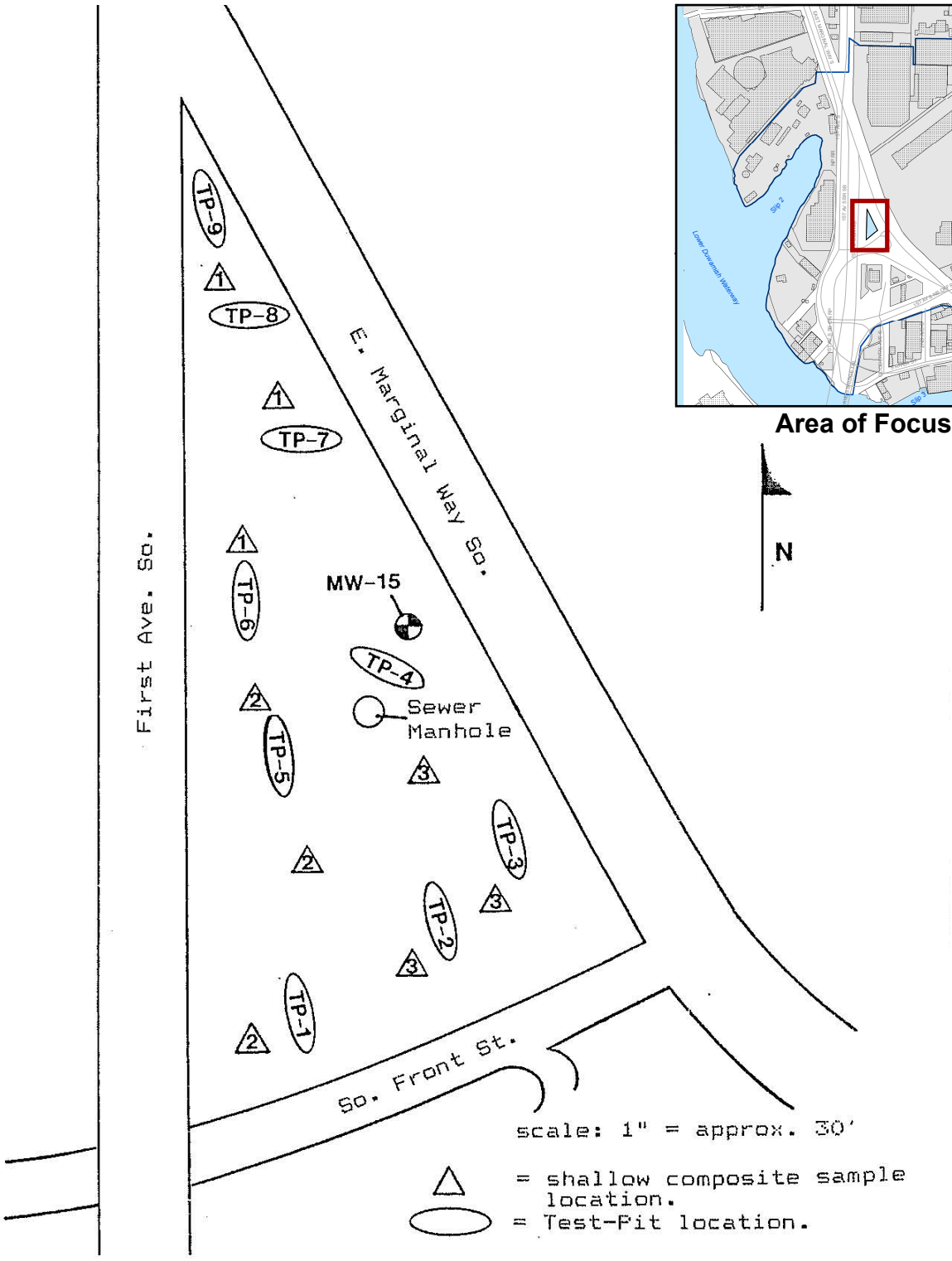


Area of Focus



ENVIRONMENTAL ASSOCIATES, INC.

SITE EXPLORATION PLAN
Vacant Parcel of Property
6305 East Marginal Way South
Seattle, Washington

Job No:	Date:		Plate
2187	DEC 92		2

Source: Environmental Associates Preliminary Environmental Study. January 1993.

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Figure 10. Former Frank's Used Cars Property Exploration Plan

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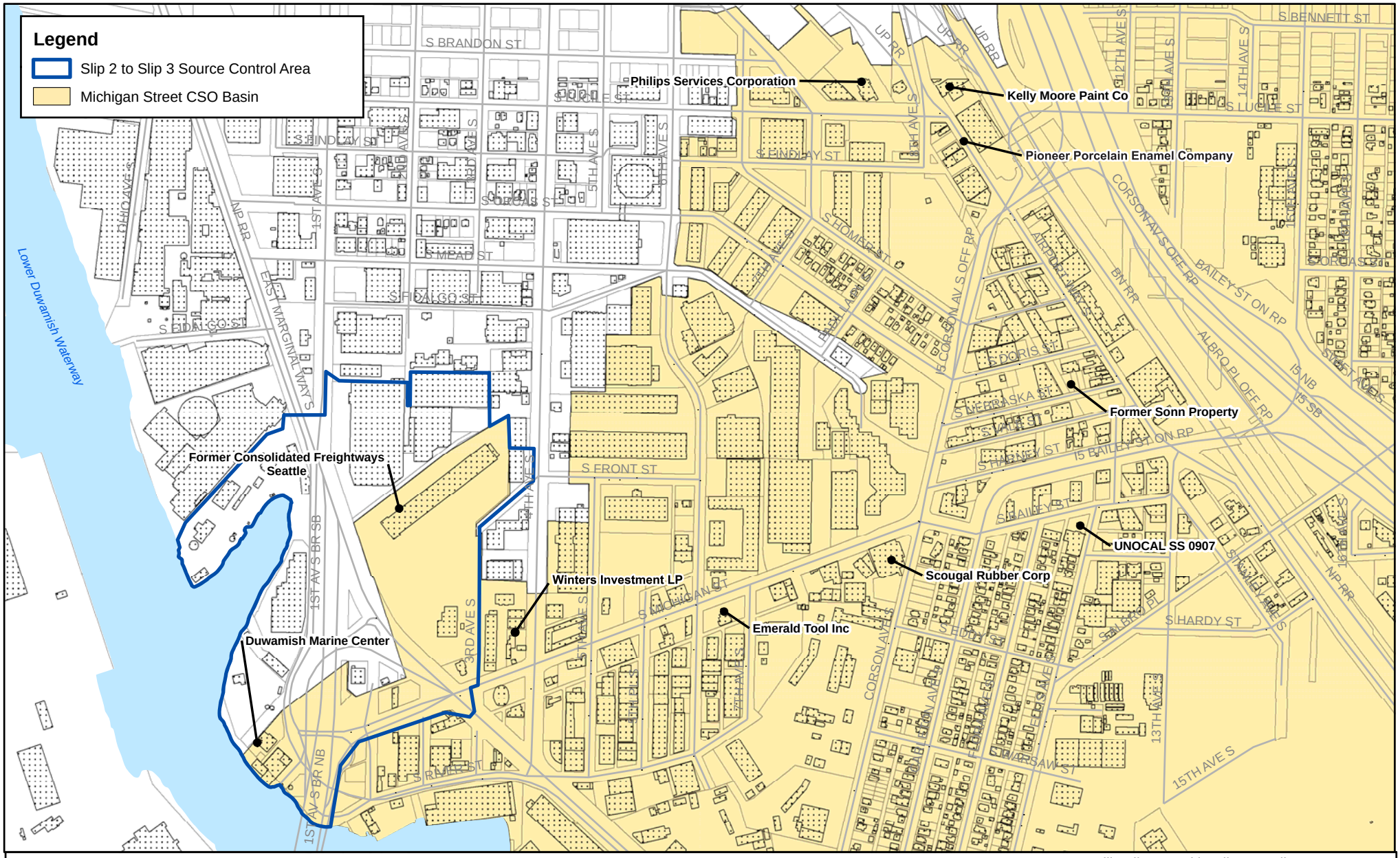

Figure 11. Potential Sources Within the Michigan Street CSO Basin

*Facility discussed in Slip 2 to Slip 3 Data Gaps report, but no action items identified in this SCAP.

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