Lower Duwamish Waterway
River Mile 1.2-1.7 East
(Saint Gobain to Glacier Northwest)

Summary of Existing Information and Identification of Data Gaps

Final Report

February 2009

Waterbody No. WA-09-1010

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DEPARTMENT OF ECOLOGY
State of Washington

Lower Duwamish Waterway River Mile 1.2-1.7 East (Saint Gobain to Glacier Northwest)

Summary of Existing Information and Identification of Data Gaps

Final Report

Contract No. C0700036
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February 2009

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Acronyms/Abbreviations

ACT	Advanced Chemical Technologies, Inc.
AET	Apparent Effects Threshold
AOP	Air Operating Permit
AST	above-ground storage tank
BEHP	bis(2-ethylhexyl) phthalate
bgs	below ground surface
Blaser	Blaser Die Casting
BMP	best management practice
Capital	Capital Industries, Inc.
CAA	Clean Air Act
CESPP	Contingency, Emergency, and Spill Prevention Plan
Chempro	Chemical Processors
COC	contaminant of concern
CSCSL	Confirmed and Suspected Contaminated Site List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
Data Gaps Report	Summary of Existing Information and Identification of Data Gaps Report
DCE	dichloroethene/dichloroethylene
DMMU	Dredged Material Management Unit
DMR	discharge monitoring report
DNAPL	dense non-aqueous phase liquids
ECHO	Enforcement and Compliance History Online
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FS	Feasibility Study
GIS	Geographic Information System
gpd	gallons per day
HCIM	Hydraulic Control Interim Measure
HHRA	Human Health Risk Assessment
HVOCs	halogenated volatile organic compounds
ISIS	Integrated Site Information System
JHG	James Hardie Gypsum
KCIA	King County International Airport
KCIW	King County Industrial Waste
LAET	Lowest Apparent Effects Threshold
2LAET	Second Lowest Apparent Effects Threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LFPP	Longview Fibre Paper and Packaging
LUST	leaking underground storage tank
MDL	method detection limit
mg/l	milligrams per liter

Acronyms/Abbreviations (Cont.)

µg/kg	micrograms per kilogram
MLLW	mean lower low water
MOU	Memorandum of Understanding
MTCA	Model Toxics Control Act
MTBE	methyl tertiary-butyl ether
MW	monitoring well
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NOV	Notice of Violation
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene/tetrachloroethylene/perchloroethylene
PCT	polychlorinated terphenyl
PID	photoionization detector
PM_{10}	particulate matter less than 10 micrometers in diameter
ppm	parts per million
PSC	Philip Services Corporation
PSCAA	Puget Sound Clean Air Agency
PSDDA	Puget Sound Dredged Disposal Analysis
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	Remedial Investigation
RM	river mile
RSI	Risk Science International
SCAP	Source Control Action Plan
SGCI	Saint-Gobain Containers, Inc.
SMS	Sediment Management Standards
SPCC	spill prevention control and countermeasure
SPU	Seattle Public Utilities
SQS	Sediment Quality Standards
SVOC	semi-volatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List
TCE	trichloroethene/trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TRI	Toxics Release Inventory
UST	underground storage tank
VC	vinyl chloride
VOC	volatile organic compound
WAC	Washington Administrative Code

1.0 Introduction

1.1 Background and Purpose

This Summary of Existing Information and Identification of Data Gaps Report (Data Gaps Report) pertains to a section of the Lower Duwamish Waterway (LDW) referred to as the River Mile (RM) 1.2-1.7 East (Saint Gobain to Glacier Northwest) source control area.[1] This source control area is on the east bank of the LDW, from approximately RM 1.2 to RM 1.7. It is defined by the boundaries of the stormwater drainage basin[2] of the designated upland area, one of several source control areas identified for the LDW Superfund site (Figure 1). The sediments in the vicinity of the RM 1.2-1.7 East source control area extend north-south between RM 1.2 and RM 1.7, and east-west from the eastern shoreline to the eastern limit of the LDW navigational channel. The RM 1.2-1.7 East source control area includes the properties adjacent to the LDW within the RM 1.2-1.7 East drainage basin, and it includes embankment areas fronting the properties at the shoreline (Figure 2). Also included in this report are four additional properties that are associated with groundwater contaminants that are relevant to the RM 1.2-1.7 East source control area.

This report summarizes readily available information regarding properties within the RM 1.2-1.7 East source control area. The summary is necessary to:

- identify potential upland sources of sediment recontamination;
- identify any potential contaminant migration pathways into the LDW;
- identify any data gaps needing attention before effective source control can be accomplished; and
- determine what, if any, effective source control is already in place.

The LDW consists of the lower 5.5 miles of the Duwamish River as it flows into Elliott Bay in Seattle, Washington. In September 2001, the U.S. Environmental Protection Agency (EPA) added this site to the National Priorities List due to chemical contaminants in sediments. The Washington State Department of Ecology (Ecology) added the site to the Washington State Hazardous Sites List on February 26, 2002.

In December 2000, EPA and 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, LDWG is conducting a Remedial Investigation/Feasibility Study (RI/FS) for the LDW Superfund site. The RI/FS process will assess risks to human health and the environment and evaluate cleanup alternatives. The RI for the site was completed in two phases in order to maximize the effective use of existing data. Phase I served the basis for identifying additional data needed to compile the RI and the baseline ecological risk assessment (ERA) and human health risk assessment (HHRA). Phase II collected

[1] This Data Gaps Report incorporates data published through November 2008.
[2] The area referred to herein as the "RM1.2-1.7 East drainage basin" is actually a sub-drainage basin of the LDW valley. The LDW valley drainage basin has been divided into the sub-drainage basins, defined tentatively by storm water collection systems and outfalls, as shown in Figure 1.

and evaluated data necessary to support the RI/FS and future risk management decisions making for the site (Windward 2008).

EPA is leading the effort to determine the most effective cleanup strategies for the LDW through an RI/FS process. Ecology is the lead agency investigating upland sources of contamination for Source Control[3] and is developing plans to reduce contaminant migration to waterway sediments. The Lower Duwamish Waterway Source Control Strategy (Ecology 2004) describes the process for identifying source control issues and implementing effective controls. The plan is to identify and manage sources of potential recontamination in coordination with sediment cleanups.

Existing administrative and legal authorities will perform inspections and ensure necessary source control actions are implemented (Ecology 2007). The plan is based primarily on the principles of source control for sediment sites described in EPA's Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites (EPA 2002), and on the Washington State Sediment Management Standards (SMS) (WAC 173-340-3707(7) and WAC 173-204-400).

The Source Control Strategy involves developing and implementing a series of detailed, area-specific Source Control Action Plans (SCAPs). Several areas, often defined by drainage basins, have been identified and prioritized for SCAP development as described in the LDW Source Control Status Report (Ecology 2007). Before developing each SCAP, Ecology often prepares a Data Gaps Report for the area. Findings from the Data Gaps Report are reviewed by LDW stakeholders and are incorporated into the SCAP. This process helps ensure that the action items in the SCAP will be effective, implementable, and enforceable.

Further information about the LDW can be found at:

- Ecology's LDW website: http://www.ecy.wa.gov/programs/tcp/sites/lowerduwamish/lowerduwamishhp.html
- EPA's LDW website: http://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish
- The LDWG website: http://www.ldwg.org

1.2 Organization of Document

Section 2 of this report provides background information on the LDW Superfund site. Section 3 provides a summary of background information on the RM 1.2-1.7 East source control area, including descriptions of the RM 1.2-1.7 East drainage basin, contaminants of concerns (COCs) to LDW sediments, and potential migration pathways of contaminants to LDW sediments. Section 4 describes potential sources of contaminants to the sediments adjacent to the RM 1.2-1.7 East source control area, including adjacent and upland facilities of concern, groundwater, stormwater, bank erosion, spills, and atmospheric deposition. Section 4 also

[3] EPA and Ecology signed an interagency Memorandum of Understanding (MOU) in April 2002 and updated the MOU in April 2004. The MOU divides responsibilities for the site. EPA is the lead agency for the sediment RI/FS, while Ecology is the lead agency for source control issues (EPA and Ecology 2002, 2004).

summarizes data gaps that will be incorporated into the SCAP for the RM 1.2-1.7 East source control area. Section 5 provides a list of documents cited in the report.

Information presented in this report was obtained from the following sources:

- Ecology Northwest Regional Office Central Records;
- Washington State Archives;
- King County Waste Discharge Permits and Authorizations;
- Seattle Public Utilities (SPU) Business Inspection Reports;
- Ecology Facility/Site Database (Ecology 2008a);
- Ecology Industrial Stormwater General Permits (Ecology 2008b);
- Ecology National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge Permit Database (Ecology 2008c);
- Ecology Hazardous Waste Facility Search Database (Ecology 2008d);
- Ecology Integrated Site Information System (ISIS; Ecology 2008e)
    - Confirmed and Suspected Contaminated Sites List (CSCSL)
    - Underground Storage Tank (UST) List
    - Leaking Underground Storage Tank (LUST) List
    - No Further Action (NFA) Sites List;
- Ecology Washington Coastal Atlas Database (Ecology 2008f);
- EPA Toxics Release Inventory (TRI) Explorer Database (EPA 2008a);
- EPA Envirofacts Data Warehouse Database (EPA 2008b);
- EPA Enforcement and Compliance History Online (ECHO) Database (EPA 2008c);
- King County Geographic Information System (GIS) Center Parcel Viewer and Property Tax Records (King County 2008a);
- LDWG Draft Phase 2 Remedial Investigation Report (November 2007) Database (LDWG 2008);
- Puget Sound Clean Air Agency (PSCAA) Approved Air Operating Permits Database (PSCAA 2008); and
- Washington Secretary of State Corporations Online Database (Washington Secretary of State 2008).

1.3 Scope of Document

The scope of the document research conducted for this Data Gaps Report is limited geographically to the area within the RM 1.2-1.7 East drainage basin (Figure 2) and discharge points into the LDW along the waterfronts of the properties within this boundary. Other potential sources of recontamination upstream of the RM 1.2-1.7 East source control area that might impact the sediments adjacent to this source control area have been or will be addressed in other studies.

This report includes review of three facilities adjacent to the LDW from RM 1.2 to 1.7: Saint-Gobain Containers, Longview Fibre Paper and Packaging, and BPB Gypsum. These three facilities make up the RM 1.2-1.7 East source control area. The potential for any existing contamination to migrate via any foreseeable pathway to the LDW was examined for each of these facilities.

Due to known concerns about significant groundwater contamination, four upgradient facilities were reviewed for potential groundwater migration to the LDW: Philip Services Corporation, Art Brass Plating, Blaser Die Casting, and Capital Industries. This report does not identify or assess other possible sources of contaminated groundwater from outside the RM 1.2-1.7 East source control area that may be migrating via unknown groundwater pathways into the adjacent sediments. Also, this report only reviews the groundwater pathway from these four upgradient facilities. Stormwater and other relevant pathways from these facilities to other parts of the LDW will be addressed as necessary in other reports.

Air pollution originating outside of the RM 1.2-1.7 East source control area may also contaminate the sediments adjacent to this source control area. Although Section 3.4 provides some limited discussion of atmospheric deposition, the scope of work for this report did not include an assessment of data gaps pertaining to air pollution effects on the sediments in the vicinity of this source control area.

Data on existing sediment contamination adjacent to the RM 1.2-1.7 East source control area are available. However, this report focuses only on upland sources that could recontaminate these sediments if sediment remediation is required. This focus does not preclude the potential for recontamination from capped sediments, if sediment-capping is the remedial option selected. It will be important to address source control needed for any contaminated sediments left in place during the remedial option selection process for the sediments adjacent to this source control area.

Quality assurance/quality control (QA/QC) on data was outside the scope of this report. Data published in previous reports approved by EPA and/or Ecology are assumed to have been validated and to be accurate. Information from reports by others that have not been approved by EPA or Ecology is included only for summary purposes.

2.0 Lower Duwamish Waterway Superfund Site

The Duwamish River originates at the confluence of the Black and Green rivers, near Tukwila, Washington. The Duwamish River flows approximately 12 miles (19 kilometers) from the confluence before splitting at the southern end of Harbor Island and then discharging into Elliott Bay. The LDW study area consists of approximately 5.5 miles of the downstream portion of the Duwamish River, excluding the East and West waterways (just south of Harbor Island).

The LDW is a receiving water body for different types of industrial and municipal stormwater and periodic overflow discharges from combined sewer systems during high rainfall events. There are currently no permitted discharges of industrial wastewater directly into the LDW. However, there are industrial and municipal stormwater discharges that currently enter the LDW.

Industrial and municipal stormwater discharges to the LDW are discussed in Sections 2.3 and 4.0.

2.1 Site History

General background and site description of the LDW Superfund site is provided in the *Lower Duwamish Waterway Phase I Remedial Investigation Report* (Windward 2003), which describes the history of dredging, filling, and industrialization of the Duwamish River and its environs, as well as the physiography, physical characteristics, hydrogeology, and hydrology of the area. In the late 1800s and early 1900s, extensive modifications were made to the river, including filling the tideflats and floodplains to create a straightened river channel. Current side slips are frequently remnants of old river bed meanders. The channel was dredged for navigation and the excavated material was used to fill the old channel areas and the lowlands above flood levels. The dredge fill materials are typically difficult to distinguish from the native silts and sands. A surficial layer of fill used for land development covers most of the lower Duwamish Valley. This material is typically more granular than the native soil because it was generally used to create stable construction conditions and/or building foundations (Windward 2003).

Most of the upland areas adjacent to the LDW have been heavily industrialized for many decades. Historical and current commercial and industrial operations include cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, and airplane parts manufacturing. Two mixed commercial and residential communities, Georgetown and South Park, are also near the LDW (Windward 2003).

2.2 Site Geology and Hydrogeology

Groundwater within the Duwamish Valley alluvium is typically encountered under unconfined conditions within approximately 10 feet (3 meters) of ground surface. Groundwater in this unconfined aquifer is found within fill and native alluvial deposits. The direction of groundwater flow in the unconfined aquifer is generally toward the LDW. However, the direction may vary locally depending on subsurface material, proximity to the LDW, and tidal influence. Tidal fluctuations generally affect groundwater flow direction within 300 to 500 feet (100 to 150 meters) of the LDW, depending on location (Windward 2003). A confined groundwater zone is present beneath the unconfined aquifer. Flow in this confined zone is to the north toward Elliott Bay. The bottom of the unconfined aquifer lies on top of a layer of marine sediment at a depth of 45 to 50 feet (13 to 15 meters) (Cook 2001).

2.3 Storm Drain and Sanitary Sewer Systems

The LDW area is served by both combined sewer systems and separated storm drain/sanitary sewer systems. In a combined system, stormwater runoff, collected from streets, parking lots, roof drains, yards, gardens, etc., is combined with industrial wastewater and sanitary sewage and conveyed to a wastewater treatment plant. Storm drains in separated areas convey stormwater runoff directly to the LDW. Most of the waterfront properties are served by separated storm drain/sanitary systems that discharge stormwater directly to the Duwamish Waterway, while sanitary sewage and industrial wastewater are discharged into the combined system that discharges to Puget Sound after being treated at a regional waste water treatment plant. Although there are situations when the combined sewer system can overflow to the LDW, there are no combined sewer overflow (CSO) outfalls in the RM 1.2-1.7 East source control area. Therefore, only the stormwater pathway is discussed in this report.

Data Gaps Reports identify all properties that potentially discharge to the sediments of the targeted source control area (whether through a CSO outfall, separated storm drain outfall, or surface water/groundwater interface), to the extent that the boundaries of the drainage basin are known. However, for areas where drainage basins overlap, a property review is performed only if the property has not already been included in a previously published Data Gaps Report. Exceptions include situations in which contaminants may be transported to the current source control area via a transport pathway that was not applicable for the earlier evaluation. In the case of the RM 1.2-1.7 East source control area, the four upgradient facilities are included because of the known contamination in the groundwater that may be migrating to sediments adjacent to RM 1.2-1.7 East. Under normal circumstances stormwater and waste water from these facilities do not have a pathway relevant to this source control area, and, if necessary, will be addressed in other reports.

3.0 RM 1.2-1.7 East Source Control Area

Altogether, seven facilities of concern are included in this report. Three are the facilities adjacent to the LDW within the RM 1.2-1.7 East source control area, and four are the upgradient facilities where known groundwater contamination exists (Figure 3). This section discusses in general the contaminants of concern and the migration pathways relevant to the RM 1.2-1.7 East source control area. Details of the seven facilities are discussed in Section 4.

3.1 RM 1.2-1.7 East Drainage Basin

The stormwater drainage basin for the RM 1.2-1.7 East source control area encompasses approximately 26.73 acres of commercial and industrial properties along RM 1.2-1.7 and between the LDW and East Marginal Way South (Figure 2). Figure 4 illustrates known storm drain system lines and outfalls within the RM 1.2-1.7 East source control area. Facilities adjacent to the LDW may discharge stormwater directly into the LDW through outfalls or by direct surface runoff. Private properties may or may not have supplied information to the city on their storm drain systems. Figures depicting private facility storm drain systems are included in Section 4, if they were available.

3.2 National Pollution Discharge Elimination System Permits

In 2005, the city of Seattle conducted a comprehensive survey of outfalls (including drainage ditches and streams) that discharge to the LDW. The survey identified 230 outfalls or other discharges. Of these, 58 are publically owned (e.g., city of Seattle, King County, Port of Seattle, Washington State Department of Transportation), 111 are privately owned, 18 have been identified as abandoned, and 39 are of unknown ownership (Schmoyer 2009). Discharges from some of these outfalls are permitted under NPDES permits. Six types of NPDES permits cover discharges to the LDW: (1) the Phase I Municipal Stormwater General Permit (applies to city of Seattle, Port of Seattle, and King County discharges), (2) the Phase II Municipal Stormwater General Permit (applies to city of Tukwila discharges), (3) Individual Permits, (4) Industrial Stormwater General Permits, (5) Sand and Gravel General Permits, and (6) Boatyard General Permits.

The **Industrial Stormwater General Permit** is the only type that applies to the RM 1.2-1.7 East source control area. Facilities of concern associated with the RM 1.2-1.7 East source control area covered under this permit are Saint-Gobain Containers, Longview Fibre Paper and Packaging, Art Brass Plating, and Certainteed Gypsum. Coverage under the Industrial Stormwater General Permit requires whole water monitoring of stormwater discharge, and development and implementation of a Stormwater Pollution Prevention Plan (SWPPP).

3.3 Contaminants of Concern

Although the scope of this report does not include a detailed review of existing conditions of the sediments in the vicinity of the RM 1.2-1.7 East source control area, results from previous LDW sediment studies provide guidance in assessing source control requirements for the upland areas. Based on sampling conducted between 1995 and 2006, several contaminants in LDW sediments within the vicinity of the RM 1.2-1.7 East source control area have concentration levels of concern. The SMS (Chapter 173-204 WAC) establish Marine Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) for some contaminants that may be found in sediments. When contaminant concentrations in sediments are less than the SQS, it is assumed there will be no adverse effects on biological resources and no significant health risk to humans. CSLs represent "minor adverse effects" levels used as an upper regulatory threshold for source control and cleanup decisions.

For this report, a COC is defined as a contaminant that could recontaminate sediments in the vicinity of the RM 1.2-1.7 East source control area if sediment cleanup occurs. To be identified as a COC for the RM 1.2-1.7 East source control area, a contaminant must have met either of the following criteria:

A. The detected concentration[4] in one or more surface or subsurface sediment samples in the vicinity of the RM 1.2-1.7 East source control area exceeded the SQS or CSL value.
B. The contaminant was detected above an applicable screening level in one or more samples of upland media (including stormwater, groundwater, soil, seeps, and storm drain solids), even if not detected in sediments within the vicinity of the RM 1.2-1.7 East source control area.

Section 3.3.1 summarizes the sediment investigations performed in the vicinity of the RM 1.2-1.7 East source control area and the COCs identified. Section 3.3.2 summarizes the COCs identified at the facilities of concern by reviewing available information and comparing sampling data to applicable screening levels.

3.3.1 Contaminants of Concern Identified through Sediment Sampling

Figure 5 depicts surface and subsurface sediment sampling locations in the vicinity of the RM 1.2-1.7 East source control area, as identified in the November 2007 *Lower Duwamish Waterway Phase 2 Remedial Investigation Draft Report* (Windward 2007a). Appendix A summarizes contaminants detected in surface and subsurface sediment samples collected through the sediment investigations described below; samples with contaminant concentrations exceeding SQS and CSL values are presented in Tables 2 and 3.

As depicted in Figure 5, dredging was performed in the area of the Certainteed Gypsum facility in 1995 and 1999. Pre-dredge samples collected from the dredged areas may no longer represent current contamination at these locations, but the results can identify potential historical (pre-dredge) upland sources that may still pose a threat to sediments. However, post-dredging samples (2000 and later) are more representative of current upland source activities.

Dredging activities performed at Certainteed Gypsum are discussed further in Section 4.2.3.3.

[4] Concentrations as reported in the November 2007 *Lower Duwamish Waterway Phase 2 Remedial Investigation Draft Report* (Windward 2007a).

Sediment Investigations

Surface and subsurface sediment samples have been collected from the vicinity of the RM 1.2-1.7 East source control area as part of the following investigations (Windward 2007a):

"Lone Star-Hardie Gypsum (1995)" – Hartman 1995

Subsurface sediment samples were collected from three locations (c-2, c-3, and c-4) within the vicinity of the RM 1.2-1.7 East source control area.[5]

Duwamish Waterway Characterization Study (NOAA 1998)

As part of the Duwamish Waterway Characterization Study, surface sediment samples were collected September-November, 1997, from five locations (EIT082, EIT083, EIT084, EST208, and EST209) within the sediments in the vicinity of the RM 1.2-1.7 East source control area. Polychlorinated biphenyls (PCBs) were detected at concentrations below SQS and CSL values in samples collected from all five locations. Polychlorinated terphenyls (PCTs) were detected at EIT083, EST208, and EST209 at concentrations ranging from 17 to 91 micrograms per kilogram (µg/kg).

Subsurface sediment samples were collected from three locations (1, 2, and 3) within the RM 1.2-1.7 East sediment area.

"Hardie Gypsum-1 (1998)" – Spearman 1999[6]

Subsurface sediment samples were collected from three locations (1, 2, and 3) within the vicinity of the RM 1.2-1.7 East source control area.

"Hardie Gypsum-2 (1999)" – Spearman 1999[7]

Subsurface sediment samples were collected from five locations (A, B, C, 3, and 2b) within the sediments in the vicinity of the RM 1.2-1.7 East source control area.

EPA Site Inspection, Lower Duwamish River (Weston 1999)

In August 1998, as part of an EPA Site Inspection, surface sediment samples were collected from three locations (DR091, DR092, and DR144) within the sediments in the vicinity of the RM 1.2-1.7 East source control area. Samples collected at all locations were analyzed for Target Analyte List (TAL) metals.[8] In addition, the sample collected from DR092 was analyzed for volatile organic compounds (VOCs), pesticides, organotins (including butyltins), and dioxins/furans.

[5] Information regarding this investigation was obtained from the 2008 Draft Final LDW RI. More information on this sediment investigation was unavailable for review at the time of publication.

[6] See footnote #5

[7] See footnote #5

[8] Target Analyte List metals are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, zinc aromatic hydrocarbons (PAHs), phthalates, and PCBs.

“James-Hardie Outfall (2000)” – (Weston 2000)

Surface sediment samples were collected from nine locations (JHGSA-SD1-02-0010, JHGSA-SD1-05-0010, JHGSA-SD1-06-0010, JHGSA-SD1-32-0010, JHGSA-SD1-COMP10-0010, JHGSA-SD1-COMP16-0010, JHGSA-SD1-COMP22-0010, JHGSA-SD1-COMP27-0010, and JHGSA-SD1-COMP32-0010) within the sediments in the vicinity of the RM 1.2-1.7 East source control area.

LDW Phase 2 Remedial Investigation, Benthic Invertebrate, Clam Tissue, and Co-located Sediment Sampling (Windward 2005a)

August-September 2004, as part of the Phase 2 Remedial Investigation, benthic invertebrate tissue and co-located sediment samples were collected. The sediments in the vicinity of the RM 1.2-1.7 East source control area included one sample collected from B5b and analyzed for TAL metals, polycyclic aromatic hydrocarbons (PAHs), phthalates, other semi-volatile organic compounds (SVOCs), organochlorine pesticides, PCBs, and butyltins.

LDW Phase 2 Remedial Investigation, Round 1, 2, and 3 Sediment Sampling (Windward 2005b, 2005c, 2007b)

Three rounds of sediment sampling were performed in 2005-2006 as part of the Phase 2 Remedial Investigation; seven surface sediment samples were collected within the RM 1.2-1.7 East sediment area. In Round 1 (January 2005), samples were collected at LDW-SS52, LDW-SS54, LDW-SS60, and LDW-SS64; in Round 2 (March 2005), samples were collected at LDW-SS61, LDW-SS65, and LDW-SSB5b; no samples were collected from the sediments in the vicinity of the RM 1.2-1.7 East source control area in Round 3 (October 2006). All samples were analyzed for SMS compounds; in addition, LDW-SS54, LDW-SS64, and LDW-SSB5b were analyzed for organochlorine pesticides, and LDW-SS64 was also analyzed for dioxins/furans and PCB congeners.

LDW Remedial Investigation, Subsurface Sediment Sampling (Windward 2007c)

February 2006, as part of the Phase 2 Remedial Investigation, subsurface sediment samples were collected from two locations (LDW-SC30 and LDW-SC31) within the vicinity of the RM 1.2-1.7 East source control area. Each sample was analyzed for SMS compounds; in addition, LDW-SC31 was analyzed for butyltins and pesticides.

Contaminants of Concern Identified

The November 2007 Lower Duwamish Waterway Phase 2 Remedial Investigation Draft Report Online Database (LDWG 2008), which summarizes all LDW sediment investigation sample results, was queried by sample location for surface and subsurface sediment samples in which contaminants were detected. Contaminant concentrations in sediment samples in the vicinity of the RM 1.2-1.7 East source control area were compared to SQS and CSL values in Appendix A, Tables A-1 and A-2; contaminant concentrations exceeding SQS and CSL values are presented in Tables 2 and 3.

To allow for comparison of applicable SMS compounds to SQS and CSL values, organic compounds were organic carbon normalized. Detected concentrations (dry weight basis) were normalized to the total organic carbon (TOC) concentration in the samples. However, comparison to TOC-normalized concentrations is only effective at predicting adverse effects in sediments with TOC content within the range of 0.5 to 4.0%. For samples with TOC concentrations outside of the applicable range, concentrations of organic compounds were compared with Puget Sound Apparent Effects Threshold (AET) values. AET values are the functional equivalent of the SQS and CSL values, only they are expressed on a dry-weight basis. The lowest AET (LAET) was used as the equivalent of the SQS, and the second lowest AET (2LAET) was used in place of the CSL.

Contaminants that exceeded the SQS or CSL values were identified as COCs and are listed in the table below. COCs identified in surface sediment included zinc at JHGSA-SD1-32-0010; chrysene at JHGSA-SD1-02-0010; PCBs at DR144, JHGSA-SD1-COMP32-00, and LDW-SS60; benzyl alcohol at B4b; and phenol at DR092. COCs identified in subsurface can be found in table 2.

Contaminants of Concern Identified through Sediment Sampling				
Contaminant of Concern	**Surface Sediment**		**Subsurface Sediment**	
	> SQS	**> CSL**	**> SQS**	**> CSL**
Metals				
Mercury			●	
Zinc	●	●		
PAHs				
Acenaphthene			●	●
Anthracene			●	
Benzo(a)anthracene			●	●
Benzo(a)pyrene			●	●
Benzo(g,h,i)perylene			●	
Benzofluoranthenes (total)			●	●
Chrysene	●		●	●
Dibenzo(a,h)anthracene			●	
Dibenzofuran			●	
Fluoranthene			●	●
Fluorene			●	●
Indeno(1,2,3-cd)pyrene			●	
Phenanthrene			●	●
Pyrene			●	
Total HPAH (total)			●	
Total LPAH (total)			●	●

Contaminants of Concern Identified through Sediment Sampling				
Contaminant of Concern	**Surface Sediment**		**Subsurface Sediment**	
	> SQS	**> CSL**	**> SQS**	**> CSL**
PCBs				
PCBs (total)	●	●	●	●
Phthalates				
Bis(2-ethylhexyl)phthalate			●	
Other SVOCs				
Benzyl alcohol	●			
Phenol	●			

Notes:
This table includes data published through March 12, 2007.
Exceedance factors and concentrations are given in Tables 2 and 3 in Section 6
Source: Lower Duwamish Waterway Group Website sediment database (www.ldwg.org).
Key:
CSL = cleanup screening level
HPAH = high-molecular-weight polycyclic aromatic hydrocarbon
LPAH = low-molecular-weight polycyclic aromatic hydrocarbon
PAH = polyaromatic compound
PCB = polychlorinated biphenyl
SQS = sediment quality standards
SVOC = semi-volatile organic compound

3.3.2 Contaminants of Concern Identified in Upland Media

Available information, including sampling results from environmental investigations, was reviewed for the seven facilities of concern identified within the RM 1.2-1.7 East source control area: Saint-Gobain Containers, Longview Fibre Paper and Packaging, BPB Gypsum, Philip Services Corporation, Art Brass Plating, Blaser Die Casting, and Capital Industries. Environmental investigations and sampling results are described in further detail for each facility of concern in Section 4.

In general, a COC was identified in upland media at a facility of concern when the contaminant was detected above an applicable screening level in one or more samples of upland media (including stormwater, groundwater, soil, seeps, and storm drain solids). Screening level criteria used included Model Toxics Control Act (MTCA) Method A cleanup levels for soil and groundwater; Ecology stormwater compliance benchmark levels for facilities covered under the Industrial Stormwater General Permit for stormwater discharge; SMS criteria for storm drain solids; and a recently developed screening tool to help determine when a detected contaminant is not a concern to LDW sediments (SAIC 2006a).

Contaminants that were no longer detected above applicable screening levels in upland media following completion of remedial actions were not included. In some instances it was not feasible to determine whether a contaminant was a COC because either applicable screening levels have not been established for the particular contaminant or media, or applicable screening levels could not be applied due to inadequate data. Whenever these situations occurred a data gap was identified to indicate where further study may be required.

Application of Sediment Management Standards to the Identification of Contaminants of Concern in Upland Media

SMS can be directly applied to COCs identified through sediment sampling; these COCs are discussed in Section 3.3.1. However, there are no established cleanup levels or management standards for storm drain solids. Technically, the SMS criteria do not apply to storm drain solids. However, SMS criteria and LAET values provide a conservative basis to evaluate contaminant concentrations in storm drain solids samples. Any contaminants found in storm drain solids above SMS or LAET/2LAET screening levels are considered to be COCs with respect to LDW sediments because if the solids migrated to the LDW they would become sediments. Although it is conservative to ignore mixing and dilution effects, SMS and LAET/2LAET criteria are considered a reasonable measure of contamination for storm drain solids. When feasible, contaminant concentrations detected in samples of storm drain solids were compared with SQS/CSL and/or LAET/2LAET values to provide a rough indication of contaminant exceedances.

Recently, Ecology developed a screening tool to help determine when a detected contaminant is not a concern to LDW sediments (SAIC 2006a). Using conservative assumptions, the screening tool translates marine sediment concentration limits defined by SMS into upland soil and groundwater concentrations or screening levels. These screening levels were calculated by applying partitioning coefficients and other factors to the SMS criteria. These screening tool levels are referred to as either "soil-to-sediment screening levels" or "groundwater-to-sediment screening levels." Concentrations less than the screening tool levels indicate that SMS compounds in upland groundwater and soil are not likely to pose a risk to LDW sediments. The screening levels calculated for this tool incorporate a number of conservative assumptions, including the absence of contaminant dilution and the existence of 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 ruling out, but not establishing, a concern. If contaminant concentrations in upland soil or groundwater are below these screening levels, it is unlikely they will exceed marine sediment SQS. Use of this tool to screen out contaminants in the presence of non-aqueous-phase liquids is inappropriate. However, upland concentrations that exceed these screening levels may or may not pose a threat to marine sediments. Additional site-specific information must be considered in order to make such an assessment.

Where feasible, these screening tool levels were compared with the most recent upland groundwater and soil results for a given property or study area. Generally, if a contaminant is not detected above the applicable screening tool level (given appropriate reporting limits), it is not a COC for the given location. However, in some instances site-specific criteria may be more stringent than the screening tool levels. In this case if a detected contaminant concentration is below a screening tool level, but above a site-specific criterion, it cannot be ruled out as a COC. In other cases the method detection limit (MDL) or reporting limit may be greater than a screening tool level. In these cases it cannot be determined whether the concentration is below the screening tool level, so the contaminant cannot be ruled out as a COC unless other factors prevail.

Contaminants of Concern Identified

Contaminants identified in upland media that exceeded an applicable screening level were identified as COCs and are listed in the table below. The upland media in which the COC was found and the potential pathways to LDW sediments are also summarized in the table. Detailed information on the COCs identified is included in Section 4 for each facility of concern.

Contaminants of Concern Identified in Upland Media			
Facility of Concern	**Contaminant of Concern**	**Media**	**Potential Pathway to LDW Sediments**
Adjacent Facilities of Concern			
Saint-Gobain Containers	Chromium compounds, ethylene glycol, lead compounds	Air emissions, stormwater discharges	Air deposition, stormwater
Longview Fibre Paper and Packaging	Base/neutral/acid organics, petroleum products, and PAHs	Soil, groundwater, air	Groundwater
Certainteed Gypsum	N/A	N/A	N/A
Upland Facilities of Concern			
Philip Services Corporation	Halogenated organic compounds, EPA priority pollutants (metals and cyanide), PCBs, petroleum products, phenolic compounds, and PAHs	Groundwater	Groundwater
Art Brass Plating	Halogenated organic compounds	Soil, groundwater	Groundwater
Blaser Die Casting	Halogenated organic compounds	Air, soil, and groundwater	Groundwater
Capital Industries	Halogenated organic compounds	Air, soil, and groundwater	Groundwater

Source: Ecology's review
Key:
PAH = polyaromatic compound
PCB = polychlorinated biphenyl

Each COC identified in upland media was considered for screening against levels defined by Ecology's screening tool, discussed above, to determine whether the potential COC could be ruled out. However, it was determined that the screening tool did not apply either because the COCs identified for the RM 1.2-1.7 East source control area were not SMS compounds, or because they were found in media other than soil or groundwater (e.g., storm drain solids or storm water).

The upland COCs and pathways in the table below show the results of Ecology's review of available information on LDW sediments between RM 1.2 and 1.7. This table shows COCs discovered in upland media and cannot be used to determine which upland COCs are also sediment COCs in the LDW. Comparison with sediment and seep data collected for the LDW sediment investigation indicates that not all of the upland COCs shown below are problematic for sediment source control.

3.4 Potential Pathways of Contamination to Sediment

To assess whether contamination in upland media is a potential source of LDW sediment recontamination, potential pathways between the potential source and the LDW must be evaluated. Pathways can lead to either point or non-point discharges. Point discharges include direct stormwater discharges via outfalls, spills, CSO outfalls, and direct wastewater discharges. Non-point discharges include groundwater migration, erosion of or leaking from bank soils, and atmospheric deposition. In some cases a pathway is not known to have any contamination, historically or currently. However, this report considers all pathways that may provide a conduit for upland contaminants to reach LDW sediments. The potential contaminant migration pathways evaluated for the RM 1.2-1.7 East source control area are described below and discussed in more detail in Section 4.

Stormwater

Stormwater discharges directly to the LDW via outfalls from sites adjacent to the river and from municipal stormwater systems, as mentioned in Section 3.2. Stormwater can also be discharged as surface runoff from businesses, roads, and residential areas upland of the river. Stormwater from upland areas may contain a wide variety of substances including bacteria, metals, oil, detergents, pesticides, fertilizers, and other chemicals that are washed off the land during rain events. Materials illegally dumped in the river as well as contaminated groundwater that enters the piped system via cracks or joints can also migrate to the LDW via the storm drain system. Pollutants are transported in dissolved and particulate phases to the LDW by a combination of public and private storm drain systems.

Storm drain and combined sewer systems in the LDW area are discussed in Section 2.3, and more specifically within the RM 1.2-1.7 East stormwater drainage basin in Section 3.1. Outfalls that discharge directly to the LDW within the RM 1.2-1.7 East source control area are shown in Figure 4, and include five private storm drain outfalls and five public storm drain outfalls. These outfalls, discussed in detail in Section 4, are:

- Outfall No. 2007: Public (King County)
- Outfall No. 2008: Public (King County)
- Outfall No. 2009: Public (King County)
- Outfall No. 2010: Public (King County)
- Outfall No. 2011: Public (King County)

- Outfall No. 2013: Private (Longview Fibre)
- Outfall No 2014: Private (BPD Gypsum)
- Outfall No. 2015: Private (BPD Gypsum)
- Outfall No. 2016: Private (BPD Gypsum)
- Outfall No. 2017: Private (BDP Gypsum)

Groundwater

Contaminated groundwater may enter the LDW directly via groundwater discharge to surface water, or through tidal fluctuation, seeps, or infiltration into storm drains/pipes, ditches, or creeks that discharge to the LDW. Contaminants from spills and releases to soils on properties in the RM 1.2-1.7 East drainage basin area may migrate to groundwater and subsequently be transported to the sediments in the vicinity of the RM 1.2-1.7 East source control area.

As mentioned in Section 2.2, shallow groundwater in the Duwamish Valley is typically encountered within about 10 feet (3 meters) of the ground surface and exists under unconfined conditions. The general direction of shallow groundwater flow in the Duwamish Valley is toward the LDW, although the direction may vary locally depending on the nature of the subsurface material, proximity to the LDW, and tidal action. High tides can cause temporary groundwater flow reversals, generally within 300 to 500 feet (100 to 150 meters) of the LDW (SAIC 2006b).

Spills

Spills of waste materials containing COCs may occur directly to the LDW through in-water activities or onto the ground within the RM 1.2-1.7 East drainage basin. Activities occurring in the RM 1.2-1.7 East upland areas at this time may result in spills if adequate containment procedures are not followed.

Bank Erosion

Waterway bank soil, contaminated fill, waste piles, landfills, and surface impoundments may release contaminants into the water within the vicinity of the RM 1.2-1.7 East source control area through soil erosion, soil erosion to stormwater, leaching to groundwater, or leaching from banks to the LDW.

Atmospheric Deposition

Atmospheric deposition occurs when air pollution deposits enter the LDW directly or through stormwater. Such deposits can be a source of contamination to the sediments in the vicinity of the RM 1.2-1.7 East source control area. Air pollution is generated from point source or widely dispersed air emissions. Examples of point source emissions include paint overspray, sand-blasting, industrial smokestacks, and fugitive dust and particulates from loading/unloading of raw materials (for example, sand, gravel, and concrete). Examples of widely dispersed emissions include vehicle emissions and aircraft exhaust.

Saint-Gobain Containers has current operations that have known point source emissions of air pollution that may contribute contaminants to sediments in the vicinity of the RM 1.2-1.7 East source control area. Air traffic at King County International Airport (KCIA) may result in significant emissions, but this pertains to the entire airfield operations and lies outside the scope of this report.

The Washington State Department of Health hired a consultant to model air emissions from multiple sources in south Seattle. The objective of the multiple-source air modeling project in the Duwamish valley was to identify (1) air pollutants, (2) key air pollution sources affecting residential areas of south Seattle, and (3) the geographic areas of south Seattle affected by air pollutants. This effort is an initial step to identify priorities for future work in the area. The modeling report summarizes key findings of the modeling effort and recommends future actions (WADOH 2008). A study on atmospheric deposition planned by the Puget Sound Partnership has not been funded yet and no schedule has been developed. Ecology will continue to monitor these efforts (Ecology 2008g).

Out of concern for phthalate recontamination at sediment cleanup sites in the larger Puget Sound region, the Sediment Phthalates Work Group was formed in 2006. To meet its goal of better understanding the sources of phthalates in sediments, the work group reviewed existing information about all possible pathways to sediments, including stormwater and atmospheric deposition. The group concluded that phthalates reach sediments via a complex pathway involving off-gassing to air followed by attachment to particulates, deposition to the ground, and transport to sediments through stormwater (Sediment Phthalates Work Group 2007).

King County conducted air monitoring in the LDW area to assess whether atmospheric deposition is a potential source of phthalates, particularly bis(2-ethylhexyl)phthalate (BEHP), in stormwater runoff (KCDNRP 2008). The most significant finding is that BEHP concentrations were up to three times greater in the Duwamish Valley stations than in the Beacon Hill station.

Based on a comparison with results from other atmospheric deposition networks that employed high-volume air sampling techniques to collect gaseous and particulate phase air samples, the total deposition results from this study are likely to be biased low for the lighter phthalates, low- to mid-range PAH compounds, and low- to mid-range PCB congeners. Since side-by-side comparison sampling of the passive atmospheric deposition samplers with high-volume air samplers was not conducted, it is not possible to assess the degree of bias (KCDNRP 2008).

Analyte	Range of Air Deposition Flux ($\mu g/m^2/day$)	Location of Highest Values
Butyl benzyl phthalate	0.163 to 7.007	South Park
Bis(2-ethylhexyl)phthalate	0.261 to 12.240	Duwamish Valley
Benzo(a)pyrene	0.008 to 2.225	KCIA
Pyrene	0.035 to 4.652	KCIA
Aroclor 1254	< 0.011 to 0.044	Georgetown
Aroclor 1260	< 0.011 to 0.034	Georgetown

The sampling stations were located at Beacon Hill, Duwamish Valley, Georgetown, KCIA, and South Park Community Center. The following range of air deposition flux values was observed (KCDNRP 2008):

Detailed results are provided in King County's *Monitoring Report – October 2005 to April 2007* (KCDNRP 2008).

4.0 Potential Sources of Sediment Recontamination

This section summarizes available information on potential contaminant sources and pathways. The information in the summary was used to identify any potential for contaminant migration and recontamination of LDW sediments. Among the several lines of evidence used to judge whether a source or pathway to sediments may exist, the lack of information for a media or pathway is also considered, particularly in light of the activities that have occurred at a site. A data gap is identified when available data are insufficient to confirm or rule out the presence of contamination or any significant potential for contaminant migration to LDW sediments.

Within the RM 1.2-1.7 East source control area, potential sources of sediment recontamination include direct discharges from public and private storm drain systems and direct and/or indirect discharges from facilities adjacent to the LDW. These storm drain systems and facilities of concern are illustrated in Figures 2 through 4 and are discussed in the following subsections. Information on the 10 outfalls known to discharge directly to the LDW from the RM 1.2-1.7 East source control area is summarized in Section 4.1.

Facilities within the RM 1.2-1.7 East source control area were identified as facilities of concern if they were listed in Ecology's Facility/Site Database, were permitted as a hazardous waste generator, or had a permitted discharge to the LDW. The four additional upland properties were listed as primary upland properties in the vicinity of the RM 1.2-1.7 East source control area in the November 2007 *Lower Duwamish Waterway Phase 2 Remedial Investigation Draft Report* (Windward 2007a). As a precaution other facilities upgradient of the RM 1.2-1.7 East source control area were considered for review if they were listed in Ecology's Facility/Site Database. Table 4 lists all the facilities considered, both adjacent to and upland of the LDW, the facility/site identification number, whether the facility was included as a facility of concern in this report, and the Ecology Program(s) associated with the site. Some of these facilities were excluded from review because there are no indications that they are contributing to known groundwater contamination.

Sections 4.2 and 4.3 categorize facilities of concern as adjacent or upland respectively. The facilities were evaluated for the following means of potential recontamination of LDW sediments:

- Existing upland contamination of soil, groundwater, stormwater, or storm drain solids;
- Migration pathways between the potential sources and the LDW; and
- Activities that could lead to an accidental release of a contaminant of concern.

Current and historical land uses, environmental investigations and cleanup activities, and facility inspections were summarized for each facility of concern where information was available. More detail is provided for facilities where more information was available for review. Property ownership information was obtained from King County tax records and from existing reports. Current land use information was obtained from existing reports and Ecology online databases. The Ecology online databases were searched for information on current NPDES permit numbers, USTs, LUST release incidents, and hazardous waste facilities, and for inclusion of the property on the CSCSL. Reports and miscellaneous information in Ecology's files were also reviewed for relevant information. Section 1.2 lists all the sources reviewed for this report.

4.1 Stormwater Outfalls

The RM 1.2–1.7 East source control area is served by both combined and separate storm drain/sanitary sewer systems. There are both public and private storm drain systems within the source control area that discharge directly to the waterway. Most of the facilities adjacent to the LDW here are served by privately owned storm drain lines. These direct discharges are authorized by Ecology through various types of NPDES permits, discussed in Section 3.2. Stormwater from businesses, roads, and residential areas upland of the river is typically regulated by the public utility agencies of Seattle, Tukwila, or King County, depending on the location and type of land use.

A wide range of contaminants may become dissolved or suspended in runoff as rain or snow melt flows over the land. Surface areas within RM 1.2-1.7 may accumulate particulates, dust, oil, asphalt, rust, metals, exposed soil, detergents, or other materials as a result of activities. In addition to rain or snow melt, storm drains can also convey contaminants in runoff from businesses resulting from vehicle washing, spills, or illegally dumped materials.

4.1.1 King County Public Storm Drains

Storm drains Nos. 2007 thru 2011 are publicly owned outfalls operated by King County (Windward 2007a). Details for these storm drains are shown in Figure 4, and more information about each storm drain is given in Table 5.

4.1.2 Private Stormwater Outfalls

Known private stormwater outfalls that discharge to the LDW from the RM 1.2-1.7 East source control area include four private stormwater outfalls belonging to BPD Gypsum and one belonging to Longview Fibre Paper and Packaging. These outfalls are shown in Figure 4 and are discussed in Sections 4.2.1 and 4.2.3 and Table 5.

4.2 Adjacent Facilities of Concern

4.2.1 Saint-Gobain Containers

Saint-Gobain Containers, Inc., (SGCI) is adjacent to the LDW on the east side between RM 1.2 and 1.5. The property is bordered on the north by the J.A. Jack and Sons property and on the south by the Longview Fibre Paper and Packaging property. East Marginal Way South borders the property to the east and the LDW borders the property to the west. Current aerial photographs show no visible distinction between the operations at J. A. Jack and Sons and SGCI, so the northern limit of this source control area is arbitrarily defined by the roof line of the structures in the northwest area of SGCI rather than by the parcel boundary (Figure 6).

Facility Summary: Saint-Gobain Containers	
Address	5801 East Marginal Way South
Property Owner	Saint-Gobain Containers
Former/Alternative Property Names	Ball Glass Ball-Foster Glass Ball-Incon Northwestern Glass Company
Former/Alternative Addresses	N/A
Former/Alternative Lessee/Operator Names	N/A
Tax Parcel No.	1722802315 (east) 1924049002 (west)
Parcel Size	12.76 acres (east) 8.76 acres (west)
NPDES Permit No.	SO3001134
EPA RCRA ID No.	WAD044589935
EPA TRI Facility ID No.	98134BLLNC5801E
Ecology Facility/Site ID No.	94925241
Ecology UST Site ID No.	5333
Ecology LUST Release ID No.	N/A
Listed on Ecology CSCSL	No
Approved Air Operating (Title V) Permit No.	11656
EPA CAA ID No.	5303300004
KCIW Permit No.	555-03

According to King County tax records, the SGCI property encompasses two tax parcels, 1722802315 and 1924049002, both listed under the address 5801 East Marginal Way South (King County 2008a). Both tax parcels are included in the RM 1.2-1.7 East source control area.

The most recent property sales record listed in King County's tax records indicates that Ball-Foster Glass Container Co. LLC purchased tax parcel 1722802315 from Ball Glass Container Corporation on September 15, 1995. The current owner of this tax parcel is listed as SGCI. Four structures are listed for this tax parcel, including a 27,315-square-foot office building built in 1970, a 195,592-square-foot storage warehouse (1960), a 166,193-square-foot industrial light manufacturing building (1960), and a 24,970-square-foot storage warehouse (1929) (King County 2008a).

According to King County tax records, the current owner of tax parcel 1924049002 is King County, and the property name is Ball-Incon. No property sales records are listed for this tax parcel. Two structures are listed including a 150,841-square-foot storage warehouse (1966) and a 43,190-square-foot storage warehouse (1974) (King County 2008a).

4.2.1.1 Current Operations

The SGCI facility is in a commercial/industrial section of Seattle. Of the 17.2 acres occupied by the facility, 9.1 acres are owned by SGCI and the rest (8.1 acres) is leased by SGCI from the city of Seattle (CRA 2005). SGCI manufactures commercial glass containers for the food and beverage industry. The facility layout as of June 2006 is illustrated in Figure 7 (CRA 2006a).

Raw materials used to make the glass consist of sand, soda ash, limestone, and cullet (recycled glass) as well as small amounts of carbocite, iron pyrites, iron chromite, salt cake, powder blue, manganese, and selenium (CRA 2006a). The raw materials are received by rail car or truck and are unloaded into storage silos until needed (SGCI 2005). Other materials used in the manufacturing process include cutting oils, mold dopes, coolants, hydraulic oils, motor oils, adhesives, a degreasing solvent, and small quantities of paints. Oils, coolants, degreasing solvents, scrap metals, and scrap carton materials are recycled. Waste generated by the facility includes industrial trash and debris, small amounts of waste batch materials, and waste oils and lubricants (CRA 2006a).

Raw materials used to make the glass are melted in five furnaces and cut into gobs, which are forced into molds using compressed air or pressure. The containers are subsequently cooled, given a coating for strength, and packed and palletized for shipment (Ecology 2003a).

Molded glass containers undergo a "hot end" coating, an annealing process, and a "cold end" coating. These occur in a lehr, or kiln. At the hot end of the lehr immediately after the containers are formed, metal oxide layers are formed by hydrolosis/pyrolysis of certain metal-containing compounds, most commonly tin tetrachloride and butyltin trichloride. The containers are annealed through a heat treatment that alters their microstructure and increases strength and hardness. The cold end coating occurs as the containers exit the annealing lehr. Cold end coating protects and lubricates the glassware so it can be moved smoothly without damage. The combination of materials creates a "permanent" coating that cannot readily be washed off in water or deteriorate in storage (Synder 1989).

There are five glass-melting furnaces at the facility. The furnaces have a combined glass-melting capacity of approximately 800 tons per day. The tanks feed nine glass-forming machines (CRA 2006a).

The facility has several shops for repair and maintenance. The mold shop is for the iron molds used to form the glass. The forklift shop is for in-plant vehicles (forklifts and payloaders). The machine shop is for the glass-forming machines and all related delivery equipment. The maintenance shop is for general repairs and painting of all other facility equipment; parts are cleaned in five immersion cleaners or "parts washers" (two are agitators and three use various solvents).

Most operations are conducted in secure buildings with concrete floors that do not have any open floor drains. An exception is in the production area where there is a drain that flows to an oil-water separator and water treatment system. All glass-forming machines are surrounded by oil absorbents to contain oil leakage (CRA 2006a).

Wastewater generated during production is collected in various sumps across the property and is routed to the facility's wastewater treatment center. An oil/water separator is used to skim oil off the wastewater during the treatment process and collected in a tank labeled "used oil." The facility has a wastewater discharge permit from King County Industrial Waste (KCIW) to discharge 50,000 gallons per day of excess water to the sanitary sewer system. Most of the water is treated and recirculated back into the glass-making process. The sludge from the treatment system and parts washers is taken offsite by Safety Kleen (Ecology 2003a).

Storm Drain System

After treatment, all sanitary and process wastewater is discharged to the combined sewer system. Non-contact cooling water had been discharged directly to the LDW, but is now recycled onsite. No septic systems exist onsite (SGCI 2005). Wastewater generated during production is collected in various sumps across the property and is routed to the facility's wastewater treatment system. Storm drains on Ohio Avenue South and on the south parking lot discharge to the Duwamish River, which forms the west property line of the facility. All other on-site storm drains discharge to the combined sewer system. No process in the facility is allowed to discharge contaminated water to any drain or discharge point that leads to the LDW under normal circumstances. The facility uses the King County sanitary sewer system under KCIW discharge permit 555-03 (Ecology 2003a). Figure 8 depicts five outfalls that discharge to the LDW, numbered 001 through 005 (CRA 2006a).

Potential Sources of Stormwater Pollution

SGCI's 2006 SWPPP is combined with a Contingency, Emergency, and Spill Prevention Plan (CESPP). The combined plan outlines possible spillage areas and the spill containment, prevention, and response measures identified for the areas. According to the plan, possible spillage areas include the following:

- industrial process areas (furnace buildings, hot end and cold end lines, plasti-shield area, and the maintenance shop; shown as Area 1 in Figure 9);
- areas where degreasing operations are performed (mold shop, maintenance shop, cold end area);
- forklift shop and machine repair areas; shown as Area 2 in Figure 9;
- inventory storage areas (facility storeroom, Quonset hut, batch house, mold dope storage room and warehouses; shown as Area 3 in Figure 9);
- inventory usage areas (hot end, cold end, batch house, #4 oil house, mold dope storage room, forklift shop, and maintenance shop; shown as Area 4 in Figure 9);
- the hazardous waste storage area;
- aboveground tanks and lines (locations are shown in Figure 9); and

- areas where diesel fuel and lubricating oils are unloaded (shown in Figure 9) (CRA 2006a).

A more in-depth delineation of the onsite separated storm drainage system and points leading to the combined sewer system is needed to further assess the threat of these areas. Potential source points that drain to the combined sewer system do not pose a concern for this source control area, but may impact the source control area with the associated CSO outfall(s).

According to the SGCI SWPPP plan, any spill that threatens to enter a facility storm drain or combined sewer system drain is immediately contained and cleaned up. Hazardous materials and wastes are handled within a building away from any exits or drains and all aboveground tanks, diked areas, and their associated aboveground lines have been located away from the drains. No quantifiable description of secondary containment within the facility was able to be found within the SWPPP, thus it is difficult to determine the risk of spills reaching the storm drain or combined sewer system. (CRA 2006a).

According to the CESPP, any water accumulating in the secondary containment around the storage tanks will be removed as necessary, as part of the weekly inspection. Depending on the conditions (described below), this water could be disposed of in several different ways.

1. If there have been no noted leaks or spills in this area since the previous inspection, and the water does not have a visible sheen, the water will be pumped out of the dike and recycled with the rest of the non-contact wastewater at the facility.
2. If there have been no noted leaks or spills in this area, but there is a visible sheen, the water will be pumped into a container and placed with the wastewaters at the facility, using care not to overflow the oil/water separator.
3. If a spill or leak has occurred in this area since the previous inspection, all waters in the area will be pumped into a suitable container (drum) and sampled to determine disposal options. The area will also be thoroughly cleaned and the water from the cleaning operation will also be placed in a container for proper disposal (CRA 2006a).

Activities and materials at the facility that are exposed to stormwater are termed "exposed sources" and are given "source numbers" of 1 through 4. The table below summarizes the exposed sources at the facility, the source number, potential pollutants associated with the source, and the best management practices (BMPs) used with each source. Source numbers are depicted in Figure 9 (CRA 2006a).

Identification of Best Management Practices			
Exposed Source	**Source Number**	**Potential Pollutants Associated with Source**	**Description of BMPs**
Scrap metal storage	1 and 4	Cutting and lubricating oil	Cover storage when not in use; good housekeeping and preventive maintenance
Trash storage (rolloff, pile, etc.)	4	Miscellaneous	Cover storage when not in use; good housekeeping and preventive maintenance
Cullet piles	3	Lubricating oil	Discharge runoff from hot end pile to the oil/water separator; good housekeeping and preventive maintenance
Vehicle maintenance/staging areas	2	Lubricating oil/fuel	Good housekeeping and preventive maintenance
Wooden pallets	2	Miscellaneous	Good housekeeping and preventive maintenance
Storage tanks	Multiple locations; see Figure 7	Oil	Secondary containment; good housekeeping and preventive maintenance
Vehicle fueling areas	Multiple locations; see Figure 9	Fuel	Good housekeeping and preventive maintenance

4.2.1.2 Historical Use

SGCI was originally constructed as the Northwestern Glass Company. The current facility has undergone several name and ownership changes but is only known to have produced glass containers (CRA 2006a). Sanborn Maps dating back to 1929 indicate that the site and surrounding area were originally operated by the Seattle Export Lumber Company, which closed sometime between 1929 and 1949. The property was later occupied by the U.S. Plywood Corporation - Lumber Division Mill, the Monsanto Chemical Company, and the Northwestern Glass Company facility. According to the Sanborn photos, there were several steel tanks along the Marginal Way frontage but the owners of the tanks are unknown. Contents of these tanks are also unknown. Historical photos indicate that the current SGCI facility began to take shape sometime between 1956 and 1967. The 1967 Sanborn map shows the entire property as having been converted over to glass manufacturing and storage by the Northwestern Glass Company (SGCI 2005).

4.2.1.3 Environmental Investigations and Cleanup Activities

Removal/Permanent Closure of Underground Storage Tanks (December 1989)

In December 1989, O'Sullivan Construction, Inc. removed four USTs and closed five in place at the SGCI facility, known then as Ball-Incon Glass Packaging Corporation. Local closure permits were obtained from the Seattle Fire Department. The table below describes the contents and removal actions for the nine USTs (O'Sullivan 1991).

December 1989 UST Closure

Size of Tank (gallons)	Last Material Stored	Method of Closure
12,000	Diesel	Filled in place
3,000	Gasoline	Removed
1,500	Oil	Removed
12,000	#2 Oil	Filled in place
12,000	#2 Oil	Filled in place
12,000	Diesel	Removed
12,000	Diesel	Filled in place
1,500	Hydraulic oil	Filled in place
1,500	"B" oil	Removed

During the December 1989 removal effort, soil samples were collected from the excavations and the soil stockpiles. The analytical results indicated diesel range organic concentrations of up to 15,947 mg/kg. Additionally, in January and February 1990, supplementary soil samples were collected from the UST areas and it was concluded that residual TPH still existed in areas from which the soils could not be removed due to structures in the way. A request for UST closure was sent to Ecology following the removal effort, but according to Ecology's files, no determination has been made to date. The UST areas are still listed in the databases as being "open" and no further information was available for review at the time of publication (SGCI 2005).

Limited Soil/Groundwater Investigation (October 2005)

From August 15 through August 19, 2005, Conestoga-Rovers and Associates conducted a soil and groundwater investigation in response to a July 2001 letter from Ecology requesting SGCI to better characterize a TCE plume that was originally discovered by Phillips Services Corporation just south of the SGCI property. Nine soil borings were drilled to 10 feet below ground surface (bgs) and 18 soil samples were collected to determine the presence or absence of VOCs and characterize the compounds, if present. Seven of the nine soil borings were additionally drilled down to approximately 50 ft bgs to facilitate the collection of 23 depth-discrete groundwater samples to verify and confirm previous VOC detections along Fidalgo Street. These soil borings were surveyed with respect to an assumed common datum in order to collect groundwater elevation data and determine the direction of groundwater flow across the site relative to local tidal fluctuation and/or other hydrogeologic factors (CRA 2005).

Results of this investigation revealed that there were no VOCs of concern detected in the soil, but TCE ranging from 2.7 to 14,000 µg/L was detected in three groundwater sampling locations

(GP-5, GP-7, and GP-8; Figure 10) at approximately 25 to 40 feet bgs. Other important conclusions reached during this investigation were (CRA 2005):

- Solvent impact was detected in groundwater samples collected just upgradient from the site (GP-8) and along Fidalgo Street (GP-5, GP-6, and GP-7). Solvent impact was not detected in groundwater samples collected from onsite borings GP-1, GP-4, and GP-9.
- Solvent impact detected in groundwater was lower in samples collected from GP-8, which is located downgradient to GP-5. The data collected from GP-5, GP-6, and GP-7 corroborate the solvent impact detected by Philip Services Corporation.
- A compilation of the data collected to date depicts a solvent-contaminated plume in the groundwater beneath the southeastern corner of the site with concentrations dispersing downgradient from a source upgradient (east-northeasterly) of the site.

Initial-Phase Focused Groundwater Investigation (September 2006)

From July 17 through July 19, 2006, Conestoga-Rovers and Associates conducted another groundwater investigation based on critical data gaps concluded from the Limited Soil/Groundwater Investigation. Field investigation activities included advancing a total of 10 soil borings to collect depth-discrete groundwater samples and further characterize and delineate VOC impact (Figure 11). One boring was driven 44 feet bgs to collect near-surface soil samples (former machine shop) and depth-discrete groundwater samples. A second boring was advanced to collect a continuous stratigraphic core. Six of the 10 borings were advanced to a depth of 49 feet bgs to collect depth-discrete groundwater samples. Two contingency borings were advanced to 49 feet bgs to further characterize and delineate VOC impact identified from expedited groundwater sample data collected from VAS-5. In addition, single well response data (slug testing) were collected at depth-discrete intervals from borings SVAS-VAS-6 (CRA 2006b).

Analytical results from this investigation indicated no VOC compounds in soil samples that exceeded MTCA method B soil standards for carcinogenic and non non-carcinogenic soils. TCE concentrations were detected above MTCA Method B standards in 22 groundwater samples collected from seven borings. Cis-dichloroethene (cis-DCE) concentrations were detected above Method B standards in 24 groundwater samples collected from seven borings. Vinyl chloride (VC) concentrations were detected above Method B standards in 34 groundwater samples collected from nine borings (CRA 2006b).

4.2.1.4 Facility Inspections

Hazardous Waste Compliance Inspection, Saint-Gobain Containers (March 2003)

On March 19, 2003, Ecology performed a Hazardous Waste Compliance Inspection at the SGCI facility. Ecology noted that one such inspection had been conducted at the facility before (in January 1997) and that no violations were observed. During the 2003 inspection, Ecology listed the following conditions that were not in compliance with Dangerous Waste and/or other environmental laws (Ecology 2003a):

1. Used shop towels were not handled in accordance with the Used Shop Towel guidance (used shop towels should be managed according to the guidance, or determined to be hazardous waste and handled accordingly).
2. Sludge from a parts washer had not been analyzed by a laboratory to determine if it was dangerous waste.
3. Spent sandblast grit produced during the blasting of cast iron parts had not been analyzed to determine if it contained heavy metals above the Toxicity Characteristic Leaching Procedure (TCLP) method, which would make it dangerous waste.
4. The caustic hot tank solution had not been designated (if it was hazardous waste it should have been handled as such).
5. Containers of used oil were not labeled “Used Oil.”
6. Several used oil containers were left open around the facility.
7. Employee training records were not kept.

Stormwater Compliance Inspection, Saint-Gobain Containers (December 2005)

On December 28, 2005, Ecology conducted a Stormwater Compliance Inspection at the SGCI facility and made these recommendations (Ecology 2005):

1. SGCI should determine the origin of the visible petroleum sheens that were observed around the raw glass storage areas, and should implement the necessary source control BMPs to correct the problem.
2. SGCI should collect and submit a stormwater sampling result each quarter, even if one or more of the permit sample collection criteria cannot be met. [Background: SGCI had submitted numerous discharge monitoring reports (DMRs) to Ecology stating that there had been no qualifying storm event; however, as of the latest modification, completed in December 2004, Ecology had required that if one or more sample collection criteria could not be met, the permitee must still collect and submit a stormwater sampling result.]

King County Industrial Waste Field Inspection (January 2007)

On January 18, 2007, King County conducted an Industrial Waste Inspection at the SGCI facility. During this annual inspection, King County noted major improvements since the previous annual inspection. Observed improvements included conditions of the pretreatment system, such as a new oil skimmer. No violations were found at this time.

EPA Request for Information (July 2008)

In July 2008, EPA sent general notice 107(e) and request for information 104(e) letters to SGCI. No information was available for review at the time of publication.

4.2.1.5 Potential Pathways of Contamination

According to the Release Reports for SGCI in the EPA's TRI database, chromium compounds were listed as onsite and offsite releases for 1988-1999. Onsite releases include emissions to the air, discharges to bodies of water, disposal to land at the facility, and disposal in underground injection wells. Offsite releases are defined as discharge to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical offsite for disposal. Ethylene glycol was listed for 1997 as an onsite release, and lead compounds were listed for 2001-2005 as point source air emissions occurring through confined air streams such as stacks, vents, ducts, or pipes. According to the Waste Quantity Reports for SGCI, chromium compounds were listed for 1991-1999 as "total quantity disposed" or "otherwise released onsite and offsite." This represents the total amount of the toxic chemical disposed of or released due to production-related events by the facility to all environmental media both on and off site during the calendar year for which the report was submitted. Ethylene glycol was listed in the 1997 Release Report, and lead compounds were listed for 2001-2005. TRI data for SGCI are summarized in Tables B-1 through B-3 in Appendix B (EPA 2008a).

Stormwater/Wastewater

The SGCI facility discharges stormwater and wastewater to the combined sewer system under Wastewater Discharge Authorization No. 555-03. The facility also treats and recirculates some wastewater back into the glass-making process.

KCIW files indicate Wastewater Discharge Authorization No. 555-03 was issued on February 13, 2007. The authorization is effective until February 12, 2012. This major discharge authorization permits SGCI to discharge industrial wastewater generated from glass container manufacturing into the combined sewer system in accordance with effluent limitations and monitoring requirements. The maximum permitted discharge volume is 50,000 gallons per day (gpd). Annual KCIW field inspections monitor compliance with the permit requirements.

Spills

Research conducted for this report found one recorded spill at the SGCI facility consisting of a diesel fuel spill on October 2, 1997. A correspondence in Ecology's files dated October 16, 1997, described this spill as a 50-gallon diesel release occurring due to the over filling of a rented compressor fuel tank. The spill occurred in a parking lot and approximately 10 gallons of diesel entered the storm drain and flowed into the LDW.

Other spills may be a potential source of contamination both through the facility's storm drain system and through surface runoff due to the facility's proximity to the LWD. Figures 8 and 9 show two drum storage areas within the storeroom and the forklift shop that are also a spill threat. These drums are in buildings with concrete floors, but since no secondary containment surrounds them, and they are close to the storm drain system, spills could reach the river.

Various aboveground storage tanks (ASTs) at the site could also produce spills. ASTs on the site are (SGCI 2005):

- One 1,000-gallon diesel fuel storage tank used to provide fuel for vehicles and emergency generators
- One 500-gallon tank containing lubrication oil for compressors
- Two 100-gallon tanks outside the forklift repair shop, one containing motor oil and the other containing hydraulic oil
- One 7,500-gallon tank used to store lubrication oil used in the glass-forming machines
- One 1,000-gallon tank used to store oil skimmed from the aboveground oil/water separating and recirculation system.

All these tanks are located outside except for the lube oil tank. The tanks have containment dikes around them of sufficient size to contain their entire contents and to allow adequate freeboard. The dike floors and walls are welded steel. There are also roofs over each AST area to prevent rainwater accumulation. All of these tanks and their associated containment structures are on concrete slabs except for the lube oil tank, which is inside a building on a concrete floor that is free of any cracks or opening. Because this tank only sits within a depressed area rather than having more clearly structured spill containment, and because spills and cracks can happen at any time, special attention should be paid to the lube oil tank to prevent spills.

Groundwater

According to the 2005 Limited Soil/Groundwater Investigation conducted by Conestoga-Rovers & Associates, groundwater elevation data indicate a net groundwater flow west southwesterly toward the LDW with some slight fluctuations due to tidal variation and/or other factors (CRA 2005). Because residual contamination was left in place after the 1989 UST removal and there have been exceedances of MTCA Method B groundwater standards, groundwater is a potential contamination pathway (SGCI 2005).

Bank Erosion

The SGCI facility is on the east bank of the LDW; however, little information was available on the construction of the banks in this area and the potential for sediment recontamination via this pathway.

Atmospheric Deposition

SGCI began operating under its first Air Operating Permit (AOP) on November 14, 1995, and submitted its most recent renewal application on May 19, 2006. The current permit, AOP No. 11656, was issued on June 6, 2007, and expires June 6, 2012. The permit is regulated under the CAA in accordance with the provisions of the PSCAA Regulation I, Article 7, and of Chapter 173-401 WAC. The Clean Air Act (CAA) ID No. is 5303300004.

Compliance history for SGCI's air operations is documented for June 2, 2002 through December 31, 2006. The PSCAA has inspected the facility annually. As of January 1, 2007, the only outstanding enforcement issues involved failed source tests. On February 22, 2007, SGCI received approval from PSCAA to install a cloud chamber scrubber on glass furnace No. 5 to control particulate matter between 2.5 and 10 μm in diameter (PM_{10}) and sulfur dioxide emissions. If this technology proves successful during the current two-year pilot study, additional cloud chamber scrubbers may be installed (SGCI 2007).

SGCI is required to submit monitoring reports, including annual emission reports, to PSCAA. During the period of initial permit issuance the company failed to submit several required reports. Resulting notices of violation were resolved under the December 31, 2003 consent decree signed by PSCAA and SGCI. According to PSCAA's ECHO database, 40 formal enforcement actions have been taken against the facility under the CAA within the last five years. Because the scope of work for this report did not include an assessment of data gaps pertaining to air pollution effects on the sediments in the vicinity of this source control area, no further information was researched.

4.2.1.6 Data Gaps

The following data gaps have been identified for the SGCI property. These data gaps must be addressed before effective source control can be accomplished for the RM 1.2-1.7 East source control area.

- According to cleanup records from the December 1989 UST removal, residual contamination was left in place due to structures in the way. A full site characterization should be conducted to further delineate the residual contamination left in place.
- The contents, history, and ownership of the steel tanks formerly located along the Marginal Way frontage need to be further investigated to determine any historical releases.
- The facility's storm drain system is not clearly described in the 2006 SWPPP. To identify necessary source control actions, drainage information is needed for the area draining to Outfalls 001 – 005. Also, pathways leading to the combined sewer should be further defined in order to confirm that all waste water is being discharged appropriately.
- More information is needed on the parts washing practices and the potential for solvent spills/releases.
- Quantifiable description of secondary containment not described in SWPPP, detailed information is needed to determine spill risks.
- Unknown quantities of petroleum products are stored onsite. Volume data are needed to determine if a spill prevention control and countermeasure (SPCC) plan is required.
- It is unknown whether any stormwater from adjacent facilities is being discharged to Outfall 005.
- A Hazardous Waste Compliance Inspection was conducted at the SGCI facility on March 19, 2003, during which Ecology identified several compliance problems listed in Section 4.2.1.3. It is uncertain if the facility is now in compliance.
- According to the 2005 Stormwater Compliance Inspection report, numerous DMRs had been submitted to Ecology stating that there was no qualifying storm event. Ecology directed SGCI to collect and submit a stormwater sampling result each quarter, regardless of whether permit sample collection criteria could be met. It is not known whether quarterly stormwater sampling is being conducted.

- The impact of the October 1997 diesel fuel spill is uncertain. It is not known whether there is any residual contamination below the ground surface or whether any portion of this spill may still be considered a source of contamination to the LDW.
- No information was found on enforcements or violations from November 14, 1995, to June 6, 2002; this information should be obtained to assess possible resulting impacts to LDW sediments.
- SGCI's response to the 104e/107e letter has not yet been reviewed. This information will be an important aspect of the source control efforts for this property.

4.2.2 Longview Fibre Paper and Packaging

Longview Fibre Paper and Packaging, Inc., (LFPP) is adjacent to the LDW on the east side at approximately RM 1.5. The property is approximately 3.36 acres and is bordered by the Duwamish River on the west, SW Fidalgo Street on the north, and East Marginal Way South on the east as seen in Figures 12 and 13.

Facility Summary: Longview Fibre Paper and Packaging	
Address	5901 East Marginal Way South
Property Owner	Longview Fibre Paper and Packaging
Former/Alternative Property Names	Longview Fibre Company
Former/Alternative Addresses	N/A
Former/Alternative Lessee/ Operator Names	N/A
Tax Parcel No.	1924049091
Parcel Size	3.36 acres
NPDES Permit No.	SO3000206
EPA RCRA ID No.	WAD009282161
EPA TRI Facility ID No.	N/A
Ecology Facility/Site ID No.	2226
Ecology UST Site ID No.	7348
Ecology LUST Release ID No.	3449
Listed on Ecology CSCSL	Yes
EPA CAA ID No.	5303315019
KCIW Permit #	KC631-631-02

According to King County tax records, there are three buildings on the LFPP property including a 119,990-square-foot distribution warehouse built in 1955, a 7,986-square-foot office building (1955), and a 10,500-square-foot storage warehouse (1980) (King County 2008a).

4.2.2.1 Current Operations

The facility manufactures, warehouses, and ships corrugated products. The company's products include paperboard, value-added corrugated and solid-fiber containers, and commodity and specialty Kraft paper (LFPP 2008). Activities associated with this corrugated box manufacturing include gluing, printing, laminating, and shipping (EMCON 2001). The primary industry activities at the facility include:

- Box manufacturing – Processing raw paper into corrugated boxes
- Storage – Tanks contain diesel, sodium hydroxide, and starch; ink is stored in 5-gallon buckets
- Shipping – Transferring finished boxes onto trucks, unloading liquid chemicals, and unloading solid materials
- Fuel – Aboveground diesel fuel tank is used as a backup fuel source for the boiler
- Maintenance – Processing machinery maintenance and repair

All manufacturing, storage, shipping, and maintenance activities are performed in enclosed structures with minimal potential for pollutants to enter the stormwater system. Refueling is done outside, and the area surrounding the double-walled diesel tank is bermed and paved to prevent releases of spilled fuel to the stormwater system (EMCON 2001).

Storm Drain System

According to the 2001 SWPPP, stormwater discharges offsite via several catch basins leading either to Outfall 001 or to the combined sewer system. Figure 13 shows the catch basins located throughout the site, outfall 001, and areas that discharge to the combined sewer system (EMCON 2001). The outfall pipe associated with Outfall 001 is approximately 18 inches in diameter and is located on the western edge of the site (EMCON 2001). Stormwater from the site conveys by sheet flow to three onsite catch basins located in the parking lot, on the rooftop, and on SW Fidalgo Street. Stormwater within these three catch basins discharge offsite through outfall 001. A small amount of stormwater is captured by three north-side catch basins that discharge to the combined sewer system (EMCON 2001).

According to the KCIW files, LFPP was issued Wastewater Discharge Authorization No. 631-02 on November 23, 2003. The authorization is effective until November 24, 2008[9]. This major discharge authorization grants permission to LFPP to discharge industrial wastewater into the combined sewer system in accordance with effluent limitations and monitoring requirements. The maximum volume of wastewater permitted to be discharged is 10,000 gpd. KCIW field inspections are conducted annually to monitor continuous compliance with permit requirements.

Potential Sources of Stormwater Pollution

LFPP's 1997 SPCC plan states that all fixed storage is either inside a building or secured so it cannot be tampered with, and all lift truck propane fuel is filled offsite. Tanks are hand-carried to and from the lift trucks, and gasoline and other items such as gallon cans of adhesive are stored in a fireproof cabinet. There are no quantifiable descriptions regarding secondary storage for the storage tanks located on-site containing diesel, sodium hydroxide, and starch (EMCON 2001).

4.2.2.2 Historical Use

According to King County tax records, the current warehouse and office building were built in 1955. Historical photographs obtained from Aerometrics (Appendix C) indicate that no major structures were built on the property until sometime between 1946 and 1956. The 1936, 1941, 1946, and 1956 aerial photos show that there was no development until LFPP was built. Little is known about the history of the industrial activities conducted at LFPP prior to the 1987 UST removal, which is described in Section 4.2.2.3.

4.2.2.3 Environmental Investigations and Cleanup Activities

According to Ecology's UST List, three USTs have been removed from the LFPP property. One (capacity not specified) stored heating fuel, and another stored between 111 and 1,100 gallons (contents not specified); the capacity and contents of the third UST are not specified. UST removal dates are not listed. The LFPP facility is also listed on Ecology's LUST list with Release ID No. 3449. This release is reported to have affected groundwater and soil. Cleanup started June 1, 1995, and monitoring commenced on March 10, 2003 (Ecology 2008e).

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[9] No information regarding a renewed authorization was available for review at the time of publication of this report.

Diesel Fuel Leak Investigation and Remediation

In August 1987, three USTs containing diesel and other petroleum products were removed from LFPP. One of the USTs had leaked. Three monitoring wells were installed near the removed tanks in October 1987 for a further investigation and to assess potential groundwater quality impacts. The location of the three monitoring wells is shown in Figure 14 (CH2M HILL 1995).

The wells were sampled on August 8, 1989, to determine the total petroleum hydrocarbon (TPH) concentrations in the groundwater. Results showed no detections of TPH in MW-2 and a trace in MW-1. MW3 showed high TPH concentration, and floating oil was noted in the well; the analysis results and observation indicated that hydrocarbons were both dissolved and suspended in water in this well. These results paralleled those of prior sampling rounds (completed December 7, 1987, and February 26, 1988) (CH2M HILL 1990).

Between October 20 and 23, 1989, additional investigation in the vicinity of monitoring well MW-3 was undertaken to assess the extent of oil floating on groundwater. Initially, three test pits were dug at distances of 10 feet to the north, west, and south of MW-3. Because a thin layer of floating oil was observed in these pits, four additional pits were excavated at further distances from well MW-3 (CH2M HILL 1990).

Following recovery of the residual floating hydrocarbons in MW-3 in 1988 and in the vicinity of the well in 1989, regular measurement and sampling of the three monitoring wells was initiated in March 1990. The goal of this post-UST removal monitoring program was to confirm the decline of total petroleum hydrocarbons in groundwater to concentrations below Ecology cleanup levels (CH2M HILL 1990).

1n 1990, a 5,000-gallon AST was installed to store No. 2 diesel as standby fuel for the natural-gas-fired plant boiler. This new tank replaced the UST that was formerly located near the east side of the plant building[10] (Figure 15) (CH2M HILL 1995).

During routine monitoring of the three onsite monitoring wells on January 4, 1991, LFPP staff observed that the water level probe used in MW-1 was covered with petroleum product. This monitoring well had always shown clean water prior to this date. An overflow during the filling of the AST was initially suspected as the source of the release. The AST had been filled after installation and was used for the first time in December 1990, when gas service to the plant was interrupted and the boiler was switched to diesel. Four fuel deliveries were made in December 1990, and visual evidence of spillage on the outside of the tank and surrounding snow-covered ground was present (CH2M HILL 1995).

Product recovery from monitoring well MW-1 was initiated immediately by LFPP staff on January 4, 1991, using pumping equipment on hand from prior fuel recovery efforts at MW-3. Recovered product was stored in 55-gallon drums. LFPP notified Ecology of the release on January 7, 1991, and updated Ecology on January 11 on the product recovery efforts and source investigation (CH2M HILL 1995).

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[10] No graphic depiction of the 5,000-gallon AST was available at the time of publication. Figure 13 only provides a location for the former UST located in the same vicinity as the 5,000-gallon AST.

Test pit excavations were again conducted on January 21, 1991, to assess the source and extent of the spill. Representatives of LFPP and CH2M HILL were present when the excavations were made. Visible product saturation and seepage from test pit walls were observed at depths of 9 to 10 feet below grade (on top of the water table), and a strong diesel fuel odor was noted. Upon completion of the pits, product rapidly accumulated on top of the water table at the bottoms of the test pits. The quantity and depth distribution of the product observed in these test pits indicated a source other than surface spillage was likely. Laboratory testing of the product confirmed it to be diesel fuel (CH2M HILL 1995).

Given the extent of product in the 1991 test pits, the decision was made to continue tracking the product with additional test pits. Product recovery was initiated by LFPP by means of a temporary perforated plywood box set in one of the test pits. LFPP subsequently perforated 10-foot lengths of 36-inch diameter corrugated steel culverts with drilled holes, and the backhoe contractor installed these open-ended pipes in test pits as sumps to enhance free product recovery (CH2M HILL 1995).

At the same time, LFPP started assessing the AST and associated fuel lines in the vicinity of the boiler. While inspecting the boiler connection, LFPP discovered a fuel bypass recirculating system that had been connected to a UST removed in 1988. The system consisted of a pump, a pressure relief valve, and a discharge line. The bypass piping system was still connected to the boiler, allowing fuel to flow from the boiler into the bypass pipe (CH2M HILL 1995).

Pressure testing of the bypass line indicated that the end formerly connected to the removed UST was not capped. As a result, whenever the boiler was operated using diesel fuel, beginning in December 1990, some of the diesel was pumped into the ground. This was determined to be the source of the diesel release (CH2M HILL 1995).

LFPP conducted boiler tests in February 1991 to measure the flow rate range of the recirculation pump and to estimate the volume of diesel that had been leaked into the ground. CH2MHill obtained the estimated amount of the diesel leak from a 1991 interoffice memorandum from Gary Smith to Dave Menenhall, both employees of LFPP. It was estimated that the boiler was in operation for 150 hours between December 18 and 28, 1990, and the range of recirculating line flow rates was estimated to be 0.66 to 0.87 gpm. The quantity of diesel released through the circulation line was estimated to be between 5,940 and 7,830 gallons (CH2M HILL 1995).

The five pipes that connected the boiler to the former boiler-fuel UST (the recirculating pipe, two product delivery pipes, and two steam-trace pipes) were subsequently disconnected from the boiler and capped outside the building wall by LFPP (CH2M HILL 1995).

As previously mentioned, LFPP started recovering product from monitoring well MW-1 on the day the product release was discovered (January 4, 1991). As the culvert product recovery sumps were installed in the nine test pits, LFPP began measuring groundwater levels and product thickness, pumping diesel from each sump, and recording the cumulative amount of product recovered (CH2M HILL 1995).

Product recovery from the sumps was conducted by LFPP from February 1991 through June 1992. LFPP fabricated a system of suction pipes in individual sumps connected to a header and suction pump. The majority of diesel was observed in sumps S-3 and S-4 closest to the uncapped recirculation pipe, and the least amount of diesel was present in sumps 1 and 6[11] (see Figure 15) (CH2M HILL 1995).

Recovered product was initially collected in 55-gallon drums. Above-ground holding tanks were subsequently used to allow storage of greater product volume and more efficient separation of diesel and water. Recovered diesel was taken offsite by an oil service company retained by LFPP. Water drained from the bottom of the storage tank was discharged to the sanitary sewer system with approval from Ecology. No information on King County's involvement is available (CH2M HILL 1995).

By June 1992, quantities of diesel in the sumps had diminished to intermittent thin product layers and sheens. At that time LFPP wanted to restore the area where diesel had been released to its earlier use for truck staging and unloading. Plans were developed for removal of the sumps, excavation and offsite disposal of diesel-contaminated soils, placement of compacted backfill, and installation of new pavement (CH2M HILL 1995).

The remediation plan, implemented October 13–15, 1992, consisted of:

- Draining and temporary removal of the 5,000-gallon diesel AST
- Demolition and removal of the concrete base/containment of the AST
- Removal and disposal of the product recovery culverts from the test pits and of monitoring well MW-1, to allow access for diesel-contaminated soil removal
- Excavation of surficial (uncontaminated) and underlying diesel-contaminated soils to the water table (approximately 10 feet below grade) within the area bounded by the physical constraints (Union Pacific Railroad tracks, LFPP plant building wall, LFPP starch silo foundation, and edge of Fidalgo Street pavement; see Figure 15)
- Segregation of excavated soils into clean and contaminated piles on the basis of field PID and visual observations
- Covered storage of contaminated soils
- Characterization of stockpiled soils for offsite disposal (contaminated soil) or for use as backfill (clean soil)
- Placement and compaction of onsite and imported backfill in the excavation
- Restoration of the AST, tank base, and surrounding pavement
- Transport and disposal of diesel-contaminated soil

4.2.2.4 Facility Inspections

Dangerous Waste Compliance Inspection

On February 26, 2003, Ecology performed a dangerous waste compliance inspection at the LFPP facility. Ecology noted that the annual waste reports completed during 2000 and 2001 indicated

[11] Sump 4 on Figure 13 is missing since it was not located in the referenced document. All other sump locations are approximate, due to the uncertainty of the source document.

that no regulated waste was generated. Ecology did not observe any violations during this inspection. (Ecology 2003b)

4.2.2.5 Potential Pathways of Contamination

Stormwater

All manufacturing, storage, shipping, and maintenance activities are performed in enclosed structures with minimal potential for pollutants to enter the stormwater system. Refueling is done outside, but the area surrounding the double-walled diesel tank is bermed and paved to prevent release of spilled fuel to the stormwater system (EMCON 2001). However, because LFPP is close to the LDW and is permitted to discharge stormwater to the LDW, it is possible for any surface contaminants to be carried by stormwater to the LDW via the storm drain system. No information was available on any monitoring results of outfall 001. Depending on monitoring results, there may be more areas of concern than those mentioned in this report.

Spills

LFPP's SPCC plan, received by the KCIW department on September 8, 1997, contained a Wastewater Discharge Permit application. This plan disclosed that there had been an oil spill that caused ground contamination. As much oil as possible was collected and recycled, and oil-contaminated soil was removed and replaced with clean fill. Due to this incident, spill prevention was put into place for fixed fuel and other fuel storage as well as for vehicles.

Future operations at the LFPP facility could result in spills. Spills or solids generated from facility operations could migrate to the LDW through the facility's storm drain system or through surface runoff since the facility is directly adjacent to the LDW.

Groundwater

LFPP was entered into Ecology's CSCSL on March 1, 1988, and is listed as having confirmed contamination of groundwater, surface water, air, and soil. Confirmed contaminants are base/neutral/acid organics, petroleum products, and PAHs. Confirmed contaminants in soil are petroleum products and PAHs. Ecology's status on this site is listed as "awaiting remedial action" (Ecology 2008e).

Ecology's LUST list currently categorizes the status of groundwater contamination at LFPP as "monitoring." This status means that groundwater contamination has already been characterized and currently only low levels of soil and/or groundwater contamination remain, and that monitoring is following the cleanup measures mentioned above.

Current quarterly groundwater monitoring reports should be reviewed to assess the threat of possible sediment recontamination following remediation of LDW sediments.

Bank Erosion

The LFPP facility is on the east bank of the LWD; however, the information reviewed did not indicate whether there is a potential for bank erosion or leaching of near-bank soils to recontaminate LDW sediments. A site inspection determined that erosion and sediment control and treatment BMPs were not needed for this facility.

Atmospheric Deposition

According to EPA's ECHO database, LFPP has a minor (non-federally reportable) operating permit, and CAA ID No. 5303315019. No inspections have ever been conducted at the facility under the CAA or Clean Water Act, and the last inspection conducted under the Resource Conservation and Recovery Act (RCRA) was on February 26, 2003. No formal enforcement actions are listed within the last five years (EPA 2008c). According to EPA's Envirofacts website, there has been a documented air release reported but details are not known.

4.2.2.6 Data Gaps

The following data gaps have been identified for the LFPP property. These data gaps must be addressed before effective source control can be accomplished for the RM 1.2-1.7 East source control area.

- More information is needed about the remediation of the diesel fuel leak. A full site characterization should be conducted to determine whether there is any residual contamination left in place from the UST removal and diesel fuel leak.
- A quantifiable description of secondary containment not is described in the 1997 SPCC plan. Detailed information is needed to determine spill risks.
- Information is needed on the monitoring and sampling history of outfall 001 in order to determine risks of sediment recontamination.

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4.2.3 Certainteed Gypsum, Inc.

Certainteed Gypsum, Inc., is adjacent to the LDW on the east side between RM 1.2 and 1.7. The property is bordered on the north by the Longview Fibre Paper and Packaging property and on the south by the Glacier Northwest property. The most recent property sales record listed in King County's tax records indicates that James Hardie Gypsum (JHG) purchased tax parcel No.1924049092 from Lone Star Northwest on May 23, 1997. The current owner of the property is listed as BPB Gypsum. The three buildings on the property include a 173,732-square-foot light industrial manufacturing building built in 1954, a 25,434-square-foot storage warehouse built in 1954, and a 50,214-square-foot storage warehouse built in 1999 (King County 2008a). All of the buildings on the property are within tax parcel No. 1924049092 (Figure 16).

Facility Summary: BPB Gypsum	
Address	5931 East Marginal Way South
Property Owner	BPB Gypsum
Former/Alternative Property Names	James Hardie Gypsum Certainteed Gypsum Lone Star Northwest Norwest Gypsum
Former/Alternative Lessee/Operator Names	N/A
Tax Parcel No.	1924049092
Parcel Size	10.08
Former/Alternative Addresses	N/A
NPDES Permit No.	SO3000056
EPA RCRA ID No.	WAD980382972 (inactive since 12/31/2004)
EPA TRI Facility ID No.	N/A
Ecology Facility/Site ID No.	2253
Ecology UST Site ID No.	7095
Ecology LUST Release ID No.	1903
Listed on Ecology CSCSL	No
EPA CAA ID No.	5303301119
KCIW Permit No.	N/A

4.2.3.1 Current Operations

The facility manufactures and recycles wallboard (Weston 2000). An aerial photo taken in July 2006 in the area of the Certainteed Gypsum facility is included as Figure 16.

The Certainteed Gypsum facility covers approximately 10 acres, which is nearly 100 percent impervious area (Weston 2000). The plant consists of the main wallboard plant building, a rock storage silo, parking areas, several truck loading and unloading areas, and a dock along the waterway. Building construction is slab-on-grade concrete floors with corrugated metal walls on steel frames (Weston 2006).

Gypsum ore for the wallboard manufacturing process is shipped via the LDW to the facility pier, located near the wallboard plant (Figure 16). The ore is transferred from the ship to the storage silo by closed conveyor. Two kettle baghouses (facilities in which particulates are removed from a stream of exhaust gases) are connected to the conveyor system along the shoreline. Raw gypsum is delivered to the crusher and then transferred to the calcining building by closed conveyor. Heat is applied to the crushed gypsum ore in the calcining units to produce an intermediate product called stucco. Manufacture of wallboard is conducted in the wallboard plant. With the exception of a process wastewater discharge to the combined sewer, the water generated is recycled into the process or evaporated in the wallboard dryer. Emissions generated from calcining operations are permitted under PSCAA (Permit No. 5303301119, discussed below) (Weston 2000).

For wallboard recycling, gypsum and paper are recovered in the recycling plant using the facility's off-specification wallboard or scrap wallboard from offsite sources. Scrap wallboard is transported to the facility by truck. The wallboard is crushed and sent through a vibratory screen where gypsum is separated from the paper backing. The gypsum is reused in the manufacturing process, while the paper is shipped offsite for recycling or disposal (Weston 2000).

Storm Drain System

Figure 17 illustrates Certainteed Gypsum's storm drain system. According to the 2000 SWPPP, the drainage system is comprised of constructed and natural features that function together to control stormwater. The constructed features include two concrete storm drains, a retention pond that consists of a concrete settling basin with an infiltration trench, a sump, multiple roof drains, and three concrete pipe outfalls that discharge to the LDW. The buried storm drains run outside the north and south walls of the wallboard manufacturing plant and discharge through two gated outfalls to the LDW. Sanitary side sewers convey wastewater from the facility to the combined sewer on East Marginal Way South (Weston 2000).

Potential Sources of Stormwater Pollution

Certainteed Gypsum's 2000 SWPPP is combined with an SPCC plan. According to the plan, possible spillage areas include (Weston 2000):

- Equipment repair shop – spills, drips, or leaks of lubricating oil, hydraulic oil, or antifreeze may reach the depression sump (as seen in Figure 17) directly or may be carried to it by rainwater. From the depression sump, material is pumped to the settling pond.
- Wallboard plant – while filling indoor storage tanks, spills of reagents (asphalt wax emulsion, ammonium/sodium lignosulfate, sodium hydroxide, trisodium nitriloatriacetate, and polynaphthalene sulfonate sodium salt) due to overfilling or rupture of transfer lines are possible.
- Conveyor – gypsum could be spilled from openings in the conveyor system.
- Wallboard recycling building – material is placed in outdoor stockpiles, and particulates are generated during handling and unloading.
- No. 2 diesel fuel tank – Release of No. 2 diesel to the storm sewer is possible as a result of secondary containment system failure (e.g., break in dike, open stormwater drainage valve).
- Gypsum recycle pile – Erosion of the recycle pile is possible, with subsequent transport of particulates to the surface depression, retention pond, or LDW.

- Waste dumpsters – Leaks of oil from materials stored in waste dumpsters (e.g., used oil filters) are possible if a dumpster has corroded or otherwise does not provide containment (however, the volume of oil is anticipated to be low).
- Manufacturing areas – Spills of reagents used during the manufacturing process due to overflows or rupture of process lines are possible.
- Any other storage tanks – Releases of No. 2 diesel to the storm sewer as a result of a secondary containment system failure (e.g., break in dike, open stormwater drainage valve) are possible.

Within the above areas of concern, the following pollutants have the potential to reach the LDW/groundwater via stormwater (Weston 2000):

- Oil and grease (PAHs) from vehicle diesel fuel, oil, or lubricant leaks
- Suspended solids (gypsum) from outdoor storage or unloading operations
- Oil and grease (PAHs) from outdoor scrap metal (e.g., used motors) storage
- Oil and grease (PAHs) from condensate discharges

To prevent stormwater contamination, Certainteed Gypsum has implemented several BMPs in order to avoid spillage of the materials listed above. Some of the BMPs implemented include regularly inspecting and maintaining the sliding gate valves in the wallboard plant and maintaining good housekeeping practices everywhere onsite. Examples of good housekeeping practices include removing spills of raw materials from the ground or floors, sweeping and vacuuming, and monitoring dumpsters for leaks and repairing/replacing as necessary.

Other measures in the SPCC plan that have implemented are:

- The main oil tank supply is enclosed by a concrete retaining wall large enough to hold the contents of the entire full tank if the fuel oil tank were to fail
- The asphalt-wax emulsion described in Section 4.2.3.5 is contained by a concrete dike around the railroad track area where the unloading occurs. If this emulsion overflows and enters the closest part of the storm drain system, a closed gate valve will prevent the spill from entering the rest of the storm drain system. These valves are regularly inspected by the engineering superintendent.
- All lubricating oil is contained in 55-gallon steel drums or in 250-gallon tanks. These drums and tanks are surrounded by a concrete retaining wall of appropriate design and height to keep the contents of the 55-gallon drums from entering the storm system. If a spill from a 250-gallon tank occurs, the storm drain system will be closed to prevent any oil entering the river.
- All minor spills will be contained and cleaned up immediately with sand or floor dry. Bags of both materials are in the store room. Waste containing sand or floor dry will be hauled away by an authorized refuse hauler to an approved dump area.

4.2.3.2 Historical Use

Certainteed Gypsum, Inc., formerly called Kaiser Gypsum and JHG, has manufactured gypsum products since 1954. From 1954 until 1988, about an acre of the west central portion of the plant property was used to store off-specification wallboard (former wallboard recycle pile). Limited quantities of solid waste such as lumber, metal scrap, and plastic wrap were also placed on the former wallboard recycle pile (Weston 2004).

4.2.3.3 Environmental Investigations and Cleanup Activities

According to Ecology's UST list, six USTs have been removed from the Certainteed Gypsum property; four stored heating fuel, one stored unleaded gasoline, and one had unspecified contents. The capacity and removal dates of the six USTs are not listed. The Certainteed Gypsum facility is also listed on Ecology's LUST list with Release ID No. 1903. Cleanup following the release started June 1, 1995, and the site was reported cleaned up on January 26, 2001 (Ecology 2008e).

Certainteed Gypsum was entered into the No Further Action list on February 23, 2006, under the facility name Certainteed Gypsum Manufacturing and is listed as No further Action after an assessment of the Independent Remedial Action was conducted under the Voluntary Cleanup Program.

Remedial Investigation of the Northwest Gypsum Solid Waste Landfill – June 26, 1987

Risk Science International (RSI) conducted a remedial investigation of the solid landfill at the Norwest Gypsum facility on May 20, 1987. The site RI involved installing four groundwater monitoring wells, sampling remedial surface water and groundwater, sampling landfill core, surveying local groundwater use, and characterizing the hydrogeology of the property (RSI 1987). Ecology gave JHG a copy of the Potential Hazardous Waste Site Identification Form, dated April 13, 1990, which summarized the results of the 1987 RI as follows:

1. "Soils exceeded 10 times the drinking water standards for arsenic, chromium, lead, and possibly cadmium and mercury."
2. "Groundwater samples exceeded drinking water standards for chromium, lead, and mercury" (Weston 2004).

Removal of Diesel Storage Tank – June 16, 1987

On June 16, 1987, Northwest Gypsum contracted Joe Hall Construction to remove and test a 1,000-gallon tank containing diesel. As testing began, Joe Hall observed what appeared to be a very small leak. After excavating around the tank, it was confirmed during pressurization that the tank had sprung a pin-hole-sized leak and a small amount of diesel had leaked out. The tank was drained, and dry ice was applied to the affected area. Approximately one wheelbarrow-full of frozen soil containing diesel oil was removed. The soil surrounding the contamination was also removed to make sure all contaminated soil had been removed. The contaminated dirt was then removed from the facility. The 1,000-gallon tank was then removed from the premises, defumed, scrapped, and disposed of at a scrap yard. Due to the small nature of the spill no sampling was conducted. All parties agreed that all impacted materials were in fact removed, and that the spill did not encounter groundwater or anything else except the dry sand.

Underground Storage Tank Closure – November 8, 1990

On November 8, 1990, JHG contracted with O'Sullivan Construction for the clean closure of four USTs. Two 1,000-gallon tanks were cleanly removed, but one was abandoned in place and slurry-filled. This decision was made due to safety concerns and was approved by the Seattle Fire Department. One 500-gallon UST was also cleanly removed.

Characterization of the Recycle Pile – James Hardie Gypsum – July 1991

Between February and March 1991, JHG contracted Roy Weston Consultants to determine the nature and concentration of metals in manufactured wallboard that was stockpiled at JHG. Nineteen samples were collected from wallboard recently purchased by JHG that awaited recycling, wallboard manufactured by other companies that had been received by JHG for recycling, and stockpiled material. This investigation concluded that the stockpiled material did not pose a threat to local groundwater quality and was acceptable for recycling.

In 1987, as part of a property transfer evaluation, RSI was retained to conduct an RI of the former wallboard recycle pile (Weston 2004).

Water Quality Certification/Modification

According to Order Number 95-2-000837, released from Ecology on June 13, 1996, JHG and Lone Star Northwest were granted a water quality certification/modification to begin work on a project to modify the area around the Kaiser Pier. The purpose was to deepen a portion of the Duwamish River channel via dredging in order to enhance berthing facilities to accommodate larger bulk cargo vessels. Included in this project was dredging of approximately 9,000 cubic yards of intertidal and subtidal sediment from 0.75 acres of the Duwamish river adjacent to the Kaiser Dock (King County, Washington, Township 19, Section 24N, Range 4E). This material constituted Puget Sound Dredged Disposal Analysis (PSDDA) Dredged Material Management Unit Numbers 4 and 5, and was disposed of at the PSDDA program's open water site in Elliott Bay. The dredging was designed to result in a final channel depth of -30 feet mean lower low water (MLLW), plus one foot of overdredge allowance. In addition, three breasting dolphins and 28 piles were proposed to be driven to support pier and walkway extensions.

4.2.3.4 Facility Inspections

Stormwater Compliance Inspection, Certainteed Gypsum, Inc., May 2006

On April 25, 2006, Ecology conducted a Stormwater Compliance Inspection at Certainteed Gypsum as required by Revised Code of Washington (RCW) 90.48.560. Ecology (2006) noted several concerns and recommendations:

- Update the facility's SWPPP to reflect current conditions as stated in condition S9 of the Industrial Stormwater General Permit. In addition, retain a copy of the SWPPP and permit onsite.

- Collect stormwater samples and submit results to Ecology each quarter as stated in condition S4.A of the Industrial Stormwater General Permit (modification date: December 1, 2004), even if one or more of the permit sample collection criteria cannot be met.
- Clean up all gypsum debris on the river bank and do not allow any of the debris to fall into the river; implement necessary source control and/or BMPs to ensure no debris enters the river in the future.
- Inspect and clean all catch basins and other stormwater drainage treatment systems.
- Repair the wheel wash station and add any additional source control and/or operational BMPs to keep gypsum dust from being tracked offsite.
- Clean up all areas that have an accumulation of gypsum dust.
- Inspect the portions of the site that border the Duwamish Waterway to determine whether gypsum-contaminated stormwater is flowing directly into the Duwamish Waterway. Where needed, redirect this stormwater into the facility's drainage system.

Stormwater Compliance Inspection, Certainteed Gypsum, Inc., October 1996

On October 16, 1996, Ecology conducted a Water Compliance Inspection to evaluate compliance with the NPDES Stormwater Permit. During this inspection, Ecology made several observations that led to the following required actions:

- Provide adequate cover and containment for oil, both new and old.
- Revise SWPPP to reduce trackout of gypsum into the yard, driveways, and East Marginal Way South. Provide an interim procedure until construction is complete, then revise the SWPPP.
- Discharging process wastewater to the storm drain system violates condition S4 of the Stormwater Permit. Discharging this wastewater to the ground or groundwater would require a state waste discharge permit. Only stormwater is authorized to be discharged through the stormwater system.

Internal Environmental Audit (September, 1999)

On September 13, 1999, JHG conducted an internal environmental audit of the facility using independent environmental consultants. On September 21, a preliminary report was released stating that the settling basin was overflowing and discharging water into the LDW. It was also learned that the stormwater gate had been left open, thus allowing the release into the LDW to occur. JHG estimated that approximately 1,500 gallons of tire wash water was discharged into the river over three weeks. As soon as the company learned of the situation, the gates were closed and the cause of the incident was investigated. It was discovered that the source was a truck tire wash station designed to drain into a settling basin adjacent to the stormwater outfall basin (Figure 17). The cause of the release was immediately corrected and the incident was reported to Ecology on October 15, 1999 (James Hardie Gypsum 1999).

EPA Request for Information (July 2008)

In July 2008, EPA sent general notice 107(e) and request for information 104(e) letters to Certainteed Gypsum. No information was available for review at the time of publication.

4.2.3.5 Potential Pathways of Contamination

Stormwater

The Certainteed Gypsum facility discharges stormwater associated with industrial activities from the facility as part of the NPDES stormwater permit program under stormwater baseline general permit No. S03-000056. Due to lack of stormwater data and history of spills and leaks at the facility, the potential of contaminant migration via stormwater must be considered very high. Areas of concern include the loading and unloading area and the outdoor storage area where various particulates, reagents, and petroleum products are used regularly.

Spills

Spills are a potential pathway of contamination both through the facility's storm drain system and through surface runoff since the facility is directly adjacent to the LDW. No spills of significant materials occurred after December 28, 1989, according to the JHG 2000 SWPPP. A spill of asphalt wax emulsion did occur in January 1986 and reach the river because the storm drain gates were inoperable. In March 1987, another spill occurred because a rubber hose from a lignosite transfer system failed, causing lignosite to spray out of the system and bypass the dike ("lignosite" is short for lignosulfate, which is an emulsifier). This spill also reached the river. Most recently there was a spill in February 2000 of Diloflo (poly naphthalene sulfonate sodium salt, a dispersing agent for pulp and paper applications). This was contained by the containment around the tank farm and was promptly pumped through a filter and reclaimed into the tank.

Groundwater

According to the February 2006 Groundwater Quality Assessment Final Report, contaminants of potential concern identified by Ecology have not been detected at concentrations exceeding Ecology-approved water quality criteria at monitoring wells BPB-MW-02, BPB-MW-03, BPB-MW-04, or BPB-MW-05 over a series of five consecutive quarterly sampling events.

An assessment of the wallboard recycle pile indicated that potentially complete exposure pathways to human, aquatic, avian, and benthic receptors in the LDW were present. However, the information in this report demonstrates that contaminants in the soil, subsurface wallboard, and associated groundwater are below Ecology-approved water quality criteria levels and therefore do not pose a threat to human health or the environment.

Bank Erosion

Erosion of the shoreline has been stopped by placing rip rap covering the entire waterfront. A greenbelt has been placed adjacent to the stabilized shoreline to increase stability and divert runoff to the retention pond (Weston 2000).

Atmospheric Deposition

According to EPA's ECHO database, Certainteed Gypsum has a synthetic minor (federally reportable) air operating permit, with CAA ID No. 5303301119. Four inspections have been conducted under the CAA within the last five years, and the last inspection was on January 25, 2007. No formal enforcement actions are listed within the last five years (EPA 2008c).

According to Ecology files, between 1978 and 1997 PSCAA issued 25 notices of violations (NOVs) and six civil penalties to JHG and to Northwest Gypsum (former operator). The total amount of fines paid to the agency, if any, is not available. Civil penalties were issued for the following types of violations:

- Equipment maintenance: Causing or allowing operation of equipment that was not in good working order, or failure to operate and maintain the control devices in good working order; and
- Illegal emissions – Violation of opacity standards for equipment with continuous opacity monitoring system. Violation of particulate matter emission standards. Emission of air contaminants posing a detriment to persons or property.

No further information was found about these penalties, and no record of a synthetic minor (federally reportable) air operating permit is available. More information is needed to assess the possibility of air deposition via Certainteed Gypsum on LDW sediments.

4.2.3.6 Data Gaps

The following data gaps have been identified for the Certainteed Gypsum property. These data gaps must be addressed before effective source control can be accomplished for the RM 1.2-1.7 East source control area.

- More information is needed about how the storm drain system is isolated if there is a lubricating oil spill from one of the 250-gallon tanks, since the walled concrete retaining area cannot contain this volume.
- Not all of the closure reports for the six USTs documented in Ecology's UST database are accounted for. Other records on these closures should be reviewed before groundwater concerns are dismissed.
- It is unclear where leaks that might occur from outside dumpsters would go. There may be a possibility of contamination leaking into the storm drain system.
- According to the LDWG Draft RI, there was one dredging event in 1995 and one in 1999. Which event Order No. 95-2-00837 refers to is unknown.
- As of the time of the SWPPP preparation (November 1993), no stormwater samples had been collected to provide data on the quality of the stormwater from the site. Current and historical information on stormwater sampling is needed to further assess the potential of contamination via the stormwater pathway.
- Compliance with corrective actions identified during the 1996 Ecology inspection needs to be clarified.

- Certainteed Gypsum's response to the 104e/107e letter has not yet been reviewed. This information will be an important aspect of the source control efforts for this property.

4.3 Upland Facilities of Concern

The following facilities have been included in this report due to concerns about significant groundwater contamination within the area of RM 1.2-1.7 East (Figure 18). Results from local groundwater investigations have indicated that contaminated groundwater emanating from the vicinity of these upland facilities could migrate through the RM 1.2-1.7 East drainage basin, thus creating a threat to sediments in its vicinity. Figure 19 shows contamination exceedances discovered during PSC groundwater investigations[12].

Although migration of contaminants through the combined sewer and any associated CSO is also of concern, this pathway will not be addressed in this document since there are no CSOs in the RM 1.2-1.7 East drainage basin. Because of this exclusion, KCIW and other discharge permits were not investigated for this report. For more information on the CSO pathway, see documents pertaining to RM 1.0-1.2 East and RM 1.7-2.0 East.

[12]Signed orders between Ecology and these facilities limit the COCs included in these investigations to primarily TCE and its degradation products. No information on metals releases or impact of those releases on the environment was available for review.

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4.3.1 Philip Services Corporation

Facility Summary: Philip Services Corporation	
Address	734 South Lucile Street
Property Owner	Philip Environmental
Former/Alternative Property Names	Philip Environmental Burlington Environmental, Inc. Chemical Processors (Chempro) Preservative Paint Company
Former/Alternative Lessee/Operator Names	N/A
Former/Alternative Addresses	N/A
Tax Parcel No.	5084400124 (north) 1722800206 (south)
Parcel Size	0.33 acres 1.62 acres
NPDES Permit No.	N/A
EPA RCRA ID No.	WAD000812909
EPA TRI Facility ID No.	98108BRLNG734SL
Ecology Facility/Site ID No.	47779679
Ecology UST Site ID No.	7401
Ecology LUST Release ID No.	N/A
Listed on Ecology CSCSL	Yes
EPA CAA ID No.	N/A
KCIW Permit No.	7670-02

Philip Services Corporation (PSC) is located approximately 4,500 feet northeast of the LDW. Properties neighboring the PSC facility include the Union Pacific Railroad to the northeast, the Stone-Drew/Ash and Jones property owned by SAD Properties LLC to the southwest, and the former Amalgamated Sugar Company property owned by PSC to the north. The facility and surrounding properties are shown in Figure 18.

According to King County tax records, the PSC property encompasses two tax parcels, 1722800206 and 5084400124. Commercial building records were not given for either tax parcel (King County 2008a).

The most recent property sales record listed in King County's tax records indicates that Chempro purchased tax parcel 1722800206 from Mr. Ronald S. West on July 17, 1986. The current owner of tax parcel 1722800206 is listed as Philip Environmental, and the property name is listed as PSC (King County 2008a).

For tax parcel 5084400124, the most recent property sales record listed in King County's tax records indicates that Chempro purchased the parcel from the Union Pacific Railroad on October 12, 1988. The current owner of tax parcel 5084400124 is listed as Philip Environmental, and the property name is listed as UP RR Lease No. 31936 (King County 2008a).

According to Ecology's UST list, 24 USTs have been closed in-place at the PSC property; the capacity, contents, and closure dates of the USTs are not listed (Ecology 2008e).

4.3.1.1 Current Operations

According to Ecology's most recent files, the PSC facility is currently a storage area for the corrective actions taking place onsite. The only operation currently being conducted on the PSC property is a groundwater extraction/treatment system (Ecology 2008h).

4.3.1.2 Historical Use

The PSC facility was a permitted RCRA hazardous waste treatment, storage, and disposal facility under 40 CFR 260-299 until December 2002, when the facility stopped accepting waste. PSC closed the facility in January 2003 in accordance with applicable RCRA, state, and Toxics Substances Control Act requirements. There are currently no waste operations conducted at the facility, although corrective action activities at the site still continue. In August 2003, all structures were removed from the property, with the exception of two tanks associated with the soil and groundwater treatment system that continues to operate as part of the corrective action at the facility. The property remains secured by an 8-foot chain-link fence topped with barbed wire that extends around the perimeter of the facility property (PSC 2003).

According to the Release Reports for PSC in EPA's TRI database, several chemicals were listed for 1998, including 1,2-dichloroethane, asbestos, benzene, butyl acrylate, carbon tetrachloride, cyanide compounds, dichloromethane, ethylene glycol, isopropyl alcohol, lead compounds, methyl ethyl ketone, methyl isobutyl ketone, n-butyl alcohol, n-methyl-2-pyrrolidone, naphthalene, toluene, trichloroethylene, xylene, and zinc compounds. Ethylene glycol and nitrate compounds were listed for 1999-2002, and lead compounds and mercury compounds were listed for 2000-2002. TRI data for PSC are summarized by report type in Appendix B, Tables B-4 through B-6 (EPA 2008a).

Surface Releases and Spills

Documented spills and releases at the facility occurred on four separate occasions from 1979 to 1990. The quantity of these spills was not always known. In addition to the documented spills and releases at the facility, undocumented releases are believed to have occurred at the facility since 1970. Between 1970 and 1987, releases from the many storage tanks onsite may have occurred due to leaks in the tanks and piping. Surface releases are also thought to have impacted soil and groundwater at the facility by way of leaking drums or leaking equipment. PCBs have been detected in groundwater at the facility and were likely released as surface spills. In addition, the onsite furnace used a product called Therminol, which was an insulating oil product known to contain PCBs. A furnace fire in early 1974 may have also resulted in PCB contamination in the soils surrounding the furnace, and residual liquid may have been released during replacement of the furnace. Between 1991 and 1993, the entire facility was capped with concrete and a storm water management system was installed to ensure complete containment of any future release (PSC 2003).

4.3.1.3 Environmental Investigations and Cleanup Activities

Remedial investigation activities (including groundwater, soil, and soil gas investigations) have been ongoing at the facility since 1988. The results of these investigations have indicated that:

- Soil contamination appears to be limited to areas within the boundaries of the facility.
- Groundwater contamination appears to have migrated offsite toward the southwest.

- Dense non-aqueous phase liquid (DNAPL), which is primarily composed of chlorinated solvents, is assumed to be present in groundwater under the facility as well as immediately to the west of the facility.

Chemicals associated with paint manufacturing, chlorinated solvents, petroleum products, VOCs, SVOCs, PCBs, and metals have been detected in both soil and groundwater at the facility. The facility is currently paved, preventing further contamination from reaching the soils and preventing direct human exposure to the existing contamination.

Groundwater contamination migrating from the facility is primarily limited to chlorinated solvent compounds such as TCE and VC, and light petroleum compounds such as benzene and toluene (PSC 2002).

Hydraulic Control Interim Measures

In June 2001, EPA and Ecology required that PSC implement groundwater interim measures, including a measure that would establish hydraulic control of non-aqueous phase liquids and dissolved plumes emanating from the facility. During 2003 and 2004, PSC implemented the hydraulic control interim measure (HCIM). The HCIM was designed to isolate the contaminated soil and groundwater in the vicinity of the facility and to minimize the potential for migration of COCs offsite. The barrier wall was installed between October 2003 and January 2004, and was keyed into the underground aquitard and the intermediate silt unit to contain the most highly impacted groundwater. The barrier wall was coupled with groundwater extraction on the inside of the wall to provide hydraulic containment by maintaining an inward-directed hydraulic gradient. The barrier wall currently surrounds the source areas and areas of the most highly impacted groundwater as identified in the 2003 RI report written by PSC. This area includes a large portion of the facility and portions of neighboring properties including the TASCO site now owned by PSC, and the SAD and Aronson properties not owned by PSC (Figure 21). To ensure that the HCIM is performing properly, monitoring wells on both sides of the barrier wall continue to be monitored for water levels, general water quality parameters, and COCs (Geomatrix 2006).

4.3.1.4 Groundwater

PSC was entered into Ecology's CSCSL on March 1, 1988, and is listed as having confirmed groundwater, soil, and air contamination. Confirmed contaminants in groundwater are halogenated organic compounds, EPA priority pollutants (metals and cyanide), PCBs, petroleum products, phenolic compounds, and PAHs. Suspected contaminants in groundwater include base/neutral/acid organics, non-halogenated solvents, and arsenic. Contaminants in groundwater listed as below MTCA cleanup levels after assessment include pesticides, reactive wastes, corrosive wastes, radioactive wastes, asbestos, and methyl tertiary-butyl ether (MTBE). Confirmed contaminants in soil are identified as base/neutral/acid organics, halogenated organic compounds, EPA priority pollutants (metals and cyanide), PCBs, phenolic compounds, PAHs, and arsenic. Suspected contaminants in soil include petroleum products and non-halogenated solvents. Contaminants in groundwater listed as below MTCA cleanup levels after assessment include pesticides, reactive wastes, corrosive wastes, radioactive wastes, asbestos, and MTBE. Confirmed contaminants in air are halogenated organic compounds and non-halogenated solvents. Contaminants in air listed as below MTCA cleanup levels after assessment include base/neutral/acid organics, EPA priority pollutants (metals and cyanide), PCBs, pesticides, phenolic compounds, PAHs, reactive wastes, corrosive wastes, radioactive wastes, asbestos, and MTBE. PSC's status is listed as "remedial action in progress" (Ecology 2008e).

Groundwater is the only potential contaminant pathway from PSC that poses a risk to LDW sediments. Although there are no current operations at the PSC site, the possibility of an HCIM system failure leading to contaminant migration to LDW sediments makes groundwater a potential pathway of contamination. Figure 22 shows former known chemical storage areas at PSC which may have contributed to the groundwater contamination on-site.

4.3.1.5 Data Gaps

The following data gap has been identified for the PSC property. This data gap must be addressed before effective source control can be accomplished for the RM 1.2-1.7 East source control area.

- Information is needed from the RI currently being implemented to assess the possibility of recontamination of LDW sediments due to past releases of VOCs/TCE at this facility.

4.3.2 Art Brass Plating

Art Brass Plating, Inc., is upland of the LDW, on the east side. The property is bordered to the north by a vacant office building and to the south by South Findlay Street. Fuiji's Teriyaki and wholesale fish retail store borders the property to the east, and 3rd Avenue South borders it to the west (Figure 18).

Facility Summary: Art Brass Plating	
Address	5516 3rd Ave S
Property Owner	Evan D. and Carmen R. Allstrom
Former/Alternative Property Names	Art Brass Plating
Former/Alternative Lessee/Operator Names (Shop Building)	Warner, Helen V.
Former/Alternative Addresses	N/A
Tax Parcel No.	5263300240
Parcel Size	.46 acres
NPDES Permit No.	N/A
EPA RCRA ID No.	WAD981772957
EPA TRI Facility ID No.	98108RTBRS55163
Ecology Facility/Site ID No.	88531932
Ecology UST Site ID No.	N/A
Ecology LUST Release ID No.	N/A
Listed on Ecology CSCSL	Yes
EPA CAA ID No.	5303300386
KCIW Permit No.	N/A

According to King County tax records, the Art Brass Plating property is tax parcel 5263300240. The address listed is 5516 3rd Ave S. The most recent property sales record listed in King County's tax record indicates that Evan Dean and Carmen R. Allstrom (current owners) bought the property from Helen V. Warner in 1986. The property name is listed as Art Brass Plating Co. The two buildings on the property include a 9,016-square-foot warehouse built in 1988 and a 9,128-square-foot office/warehouse built in 1983 (King County 2008a).

4.3.2.1 Current Operations

Art Brass Plating, Inc. is an active metal finishing business. The three main areas of business are polishing, plating, and powder coating. Products include ornamental brass castings and bronze fixtures. The company specializes in plating and polishing base materials such as zinc die castings, aluminum, stainless steel, copper alloy, and cast iron. The company is owned by Mr. Evan Dean Allstrom and Mrs. Carmen Allstrom. Art Brass specializes in plating and polishing base materials such as zinc die castings, aluminum, stainless steel, steel, copper alloys, and cast iron. The facility layout of Art Brass is shown in Figure 23.

Some operations within Art Brass require toluene to be applied in a permitted spray booth.[13] Other spent solutions, combined waste solids, and accumulated paint waste are stored in a no-outlet, no-cross-contact bermed area. They are profiled, manifested, and shipped off by Envirotech Systems for incineration or by Clean Harbors for further treatment or reuse. Art Brass does not use any chemical listed in the CFR 413.02 or 433.11 definition of Total Toxic Organics in any area that drains to the sanitary system (King County 2005).

[13] Information regarding the nature of this permit was unavailable at the time of publication of this report.

4.3.2.2 Historical Use

Art Brass was established at the turn on the 20th century as a manufacturer of builders' hardware items. It created brass cast mailboxes, bank and elevator ornamental brass, and bronze fixtures. Around 1915, nickel plating was added to the operation. Just before WWII, Art Brass focused on decorative plating and polishing rather than casting, offering cadmium, zinc, silver, copper, nickel, chromium, brass, and bronze plating on zinc die-cast, steel, and brass (Art Brass 2008).

Release reports for Art Brass Plating in the EPA's TRI database list chromium compounds for 1988-2004 and nickel compounds for 2005. The Waste Quantity Reports for Art Brass Plating list chromium compounds for 1991-2004 and nickel compounds for 2005. TRI data for Art Brass Plating is summarized by report type in Appendix B, Tables B-7 through B-9 (EPA 2008a).

4.3.2.3 Environmental Investigations, Cleanup Activities, and Facility Inspections

Dangerous Waste Compliance Inspection, Art Brass Plating (June 1997)

On June 18, 1997, Ecology performed a Dangerous Waste Compliance Inspection at the Art Brass Plating facility. During the inspection Ecology observed the following conditions that were not in compliance (Ecology 1997):

- A drum of TCE still bottoms dated February 1, 1996, had exceeded the accumulation time limits.
- A sack of hydroxide sludge was open and unlabeled.
- There was not a detailed hazardous waste training plan (the section in the spill contingency plan lacked detail).
- The waste code "F009" was not being applied to batch-tested waste amounts and to sludges.
- There was an accumulation in the secondary containment under process tanks and in the waste treatment area (acid storage area); (the inspection report did not identify the accumulated substances).
- Spilled hazardous substances/waste that should have been cleaned up promptly were allowed to accumulate in the containment area.
- Dripping hazardous wastewater from the bin under the sludge press was allowed to run onto the floor instead of contained in a tray.
- Weekly inspections and periodic general inspections with log recordkeeping need to be done (was not evident at time of inspection).
- Cigarettes were stored in the "No Smoking" waste treatment/accumulation area.

No information was available to determine whether these compliance issues have been addressed.

Dangerous Waste Compliance Inspection, Art Brass Plating (August 1998)

On August 26, 1998, Ecology performed another Dangerous Waste Compliance Inspection at the Art Brass Plating facility. Ecology observed the following conditions not in compliance (Ecology 1998a):

- WAC 173-303-170(3): The generator did not treat dangerous waste onsite in accordance with the requirements for Treatment by Generator (including, by reference, WAC 173-303-200, -630, and -640). Concentrated wastes from the floor and from process tanks were being treated by precipitation and separation of solids during batch treatment in tanks in the waste treatment area. (Decanted and separated water was being reused as rinse water.) Although the KCIW program imposes conditions on rinse water quality for discharge after reuse, the waste treatment process itself is regulated under WAC 173-303. Problems included (1) hazardous waste and risk marking on treatment and holding tanks were lacking, and (2) daily inspections were not performed. A 55-gallon drum of partially treated waste was open and unlabeled, and lacked an accumulation start date. The tank containment appeared to lack necessary detection equipment. A layer of waste liquid was standing in the containment area under the filter press. This violation was also noted in the previous June 18, 1997, inspection. Log record keeping for batches treated was not adequate for waste tracking and reporting.
- WAC 173-303-200(I)(a): Dangerous waste was accumulated onsite for more then 90 days. A drum of waste sodium sulfite had been determined to be unusable approximately six months earlier, but had been held in the waste treatment area since then with no progress toward arranging proper disposal.
- WAC 173-303-200(1)(c),(d): A container of dangerous waste was not labeled "Hazardous Waste" or "Dangerous Waste." The major risks associated with the waste were not posted, and the container was not marked with an accumulation start date. The drum of waste sodium sulfite mentioned above lacked required labeling and marking. A sack of hydroxide sludge lacked an accumulation start date. This was also a violation in the June 18, 1997, inspection.
- WAC 173-303-200(1)(b) and by reference -630(2): A container of dangerous waste was not maintained in good condition. The 70-gallon steel drum of waste sodium sulfite mentioned above was in poor condition and severely corroded. The bottom was at risk of rupture.
- WAC 173-303-200(1)(e) and by reference -350: The contingency plan was not adequate. The plan lacked critical information on emergency equipment. It did not mention the location and function of, or the procedures for using, the emergency holding tank. This was another violation seen at the June 18, 1997, inspection.
- WAC 173-303-145(2): Spills of dangerous waste were not adequately cleaned up; a tank holding did not meet the applicable requirements. Dragout spills to the plating room floor were ongoing. Waste spills were left standing on the floor using the containment as an accumulation tank. The floor didn't meet tank design, operation, and maintenance requirements. This violation was also noted in the June 18, 1997, inspection. Some progress had been made toward removing 11 cubic yards of accumulated waste from the floor, but a similar amount of waste was estimated to remain on the floor under the

process tanks. Ecology also noted a potential threat to human health caused by lack of segregation between cyanide and acid process areas (spills could mix on the floor, creating toxic cyanide vapor). Another potential threat to the environment (soil, groundwater, and site stormwater) noted was from waste migration out of the building. Ecology observed blue-green corroded mortar and bubbled paint in three locations on the outside of the concrete building wall within 18 inches of grade level. The soil under the floor and under the wall was at high risk of ongoing contamination. An unknown white residue on the asphalt pavement by a plating room back door may also have been waste-related.

No information was available to determine whether these compliance issues have been addressed.

Final Warning Letter (September 22, 1998)

On September 22, 1998, Ecology sent Art Brass a "Final Warning Letter" in reference to the inspection of June 16, 1997. The following compliance action items were to be completed (Ecology 1998b):

- Remove all solid and liquid hazardous waste from the floor.
- Decontaminate the floor and lower 3 feet of wall surfaces.
- Obtain an assessment from an independent licensed professional engineer of the condition and integrity of the containment as a tank system for the time it has been in service. Include the wall and footing and cracks and joints.
- At significant cracks and at wall areas with known problems, sample the surrounding soils for migrating hazardous waste constituents including copper, nickel, zinc, lead, chrome III and VI, and total cyanides.
- Check groundwater conditions for dissolved metals and pH.
- If possible, clean up to MTCA standards any hazardous waste constituents that migrated beyond containment. Submit a plan for Ecology approval describing any planned removal/disposal of soil and/or concrete. Then complete the work. Submit a full report of these activities with appropriate sample results verifying cleanup.
- If a full cleanup is not possible at this time, file a deed restriction stating the conditions that remain, providing for restricted use of the property.

No information was available to determine whether these compliance issues have been addressed.

Soil and Groundwater Sampling (March 1999)

On March 29, 1999, Art Brass contracted Professional Services Industries, Inc., to conduct a soil and groundwater investigation to address some of the compliance issues mentioned in Ecology's final warning letter. The objective of this investigation was to determine whether plating fluids had breached the secondary containment system inside the building, migrated through an annular space between the floor and wall, and reached the soil and groundwater below the exterior wall.

Two locations were identified and marked by Art Brass Plating where a release may have occurred. These locations were the subject of the investigation (Figure 23).

The scope of the investigation included advancing two strataprobes to a maximum depth of 9 feet at the subject location selected by Art Brass Plating. Soil and groundwater samples were collected from each probe location and submitted to an Ecology-accredited laboratory for chemical analysis. The samples were evaluated for total metals (Cu, Cr, Ni, Pb, and Zn) and total cyanide concentration. The results were compared with MTCA Method A cleanup levels (PSI 1999).

Based on the results of the investigation, PSI concluded that a relatively minor release of plating fluid may have occurred on the west side of the building, which resulted in elevated lead and zinc concentrations within the near surface soil. Lead concentration did not exceed the MTCA Method A cleanup level at this location, but chromium concentration did. No cyanide was detected in either the soil or the groundwater at either probe location (PSI 1999).

Old Plating Area Clean-out and Engineering Report (April 1999)

In April 1999, Advanced Chemical Technologies, Inc., (ACT) reviewed the cleanout of the old plating area and an engineering report, as required by the "Final Warning" letter from Ecology. During this assessment ACT examined the plating area to determine whether any environmental damage was present. Conclusions of this assessment included:

- Use of the area for hazardous materials operations had ceased but hazardous material storage had started in the renovated areas.
- Undesired flows had ceased.
- Waste in the secondary containment system had been removed.
- The slab and sump areas were in good condition and were not likely to be potential release paths for hazardous materials.
- The gaps in the slab-to-wall areas were release paths for hazardous materials to the exterior wall-to-foundation joint. Significant leakage to the soil under the slab was not likely. Leakage was not from a tank or containment breach but was apparently from spray rinse operations depositing between the wall and the containment berm.
- The surface and near-surface paving, and soil under the exterior wall leak paths, were to be sampled for heavy metals. This screening method would determine the need for further investigation.
- The company was to be aware of and follow, as needed for the release investigation and evaluation, the administration and clean up requirements of the Dangerous Waste Regulations, the MTCA, and their referenced methods.

Cyanide and Nickel Violations

During the 2000 KCIW permit renewal process, King County lowered the discharge limits for Art Brass, requiring the company to isolate cyanide wastewater and install a cyanide treatment system. By the end of 2001, Art Brass was in Significant Non-Compliance for violations of the monthly amenable cyanide limit (0.32 milligrams per liter (mg/l)) (King County 2005).

Following the 2001 violation, another cyanide violation was committed in October 2004, which was attributed to a reduction in the chlorine concentration in the cyanide treatment system. Due to the low chlorine strength, the solution was being pumped into the treatment tank but the necessary oxidation-reduction potential was not being achieved. To resolve this issue, Art Brass installed an alarm that sounds if the chlorine solution pump is on for more than five minutes (King County 2005).

Art Brass Plating had another discharge limit violation in October 2005. This violation was for nickel (9.93 parts per million [ppm]) on a composite sample collected by King County. A "No Further Action" was issued because Art Brass had responded quickly, the violation was of short duration. (King County 2008b).

King County Compliance Inspection (November 2007)

On November 6, 2007, King County compliance specialist Tammy Hines collected a heavy metals composite sample at Art Brass Plating. The results of the composite sample (4.2 ppm for copper and 2.73 ppm for nickel) exceeded the discharge limits of 3.0 ppm and 2.5 ppm, respectively. A No Further Action was issued for the nickel result because it fell within the confidence limit (King County 2008b).

To further investigate the copper violation, Art Brass Plating submitted the split composite sample provided by King County to Art Brass's contract laboratory (B&P Laboratories, Inc.). These results were 2.38 ppm for copper and 0.93 ppm for nickel, both within King County's discharge limits.

Where discrepancy exists between King County results and a contract laboratory's results, King County's policy is to compare the average value of the two lab's results with the discharge limits. In this case, the average for copper was 3.30 ppm, which violated the 3.0 ppm limit. For nickel, the average of 1.83 ppm was in compliance with the discharge limit of 2.5 ppm.

Art Brass Plating representative Bob Hay hypothesized sloppy plating practices on the evening shift as the cause of the violation. In response to this violation, the evening shift metal plating personnel were threatened with a three-day suspension if proper plating procedures were not used.

King County Industrial Waste Field Inspection (August 2007)

On August 13, 2007, King County conducted an annual Industrial Waste Field Inspection for Art Brass Plating, Inc. During this inspection, King County reviewed the company's permits, self-monitoring information, and major changes made since the last inspection. Compliance issues observed by King County during this inspection included elevated levels of trichloroethylene (TCE) discovered in a monitoring well used to trace a TCE plume. The King County inspector informed the Art Brass representative that discharge from the well was not covered under the existing permit and that the company would need to apply for a new authorization if it wished to discharge contaminated groundwater (King County 2007).

Another issue observed during this inspection was that there were no pH meter calibration records onsite. The King County inspector informed the Art Brass representative that dated records of the calibration checks should be maintained.

King County Industrial Waste Field Annual Inspection (June 2008)

On June 11, 2008, King County conducted its annual Industrial Waste Field Inspection for Art Brass Plating, Inc. During this inspection, King County examined permit information, self-monitoring requirements, and any major changes since the last annual inspection. The county noted construction going on throughout and around the Art Brass facility. Construction activities included installation of a soil vapor extraction system for onsite TCE. This system is comprised of laterals installed into ditches as wells and other vertical points that have suction applied. There are a total of 51 vertical points and wells and six runs of laterals (Aspect 2008a) There was no record of any discharges from this remediation project being released to the river.

Observed discharges to the King County sewer system included rinse waters from both non-cyanide and cyanide systems waste. The pH was recorded as 7.8, and approximately 25,000 gallons per day were estimated to have been released recently. No problems or violations were observed during this inspection.

4.3.2.4 Potential Pathways of Contamination

Groundwater

Art Brass Plating was entered into Ecology's CSCSL on July 21, 2005, and is listed as having confirmed soil and groundwater contamination. Confirmed contaminants in soil and groundwater are halogenated organic compounds. The status of this site is currently listed as "Remedial Investigation/Feasibility Study" (Ecology 2008e). Groundwater migration from the Art Brass facility is a potential pathway of contamination.

Spills

On August 4, 1999, Art Brass released a report describing the events of August 3, 1999, that led to the required implementation of the Contingency Plan. According to the report submitted by Mr. Bob Hay, an environmental engineer, at approximately 09:15 on the morning of August 3, 1999, an Art Brass Plating, Inc. employee observed brass plating solution exiting the plating shop back door, adjacent to South Findlay Street and running west toward the drain at the intersection of South Findlay and 3rd Avenue South. The cause of the spill was an employee topping off the brass tank with water, and leaving the tank unattended after filling, thus allowing the tank to overflow. The tank was close enough to the bermed area that the solution flowed over the extended lip of the tank, on top of the berm and out the building to the asphalt adjacent to South Findlay Street. Approximately 30 gallons of the brass plating solution containing cyanide concentrations above reportable release limits were released into the asphalt drainage system. The spill was halted approximately 15 feet from the storm drain and immediate cleanup measures and decontamination were started. At 9:30, approximately 30 gallons of the solution had been vacuumed up and placed in a poly drum along with approximately 100 pounds of surrounding gravel. Following initial response efforts, employees used 5-gallon buckets of water to rinse the spill area while vacuuming up the rinsate in an effort to dilute the residual cyanide. This was done in three sessions using five buckets a session, followed by the inclusion of calcium hypochlorite mixed at about 6 ounces/gallon; this mixture was also poured on the area and then vacuumed. The poly drums were then transported to a tank in the waste treatment area for processing. Exposed equipment was bleached, rinsed, and stored while the original condition of the zone was returned to normal. The remaining steel drum was labeled hazardous waste and reported to King County Industrial waste and Ecology.

Corrective measures that took place due to this incident included construction of a secondary berm at the back door where the incident occurred and a shield on the corner of the brass tank. Audible alarms were also installed for leak detection in the berms after the incident.

As the spill history at Art Brass indicates, spills from industrial activities taking place at this site are a potential pathway for contaminates to the King County Sewer System, which has the possibility to overflow to the LDW during a CSO event. If allowed to percolate into the ground, spills could also lead to further groundwater contamination.

Atmospheric Deposition

According to EPA's ECHO database, Art Brass Plating has a minor (non-federally reportable) operating permit, and CAA ID No. 5303300386. The last inspection for the CAA was on July 27, 2007, and there have been two formal enforcements within the last five years. No further information is available about these formal enforcements (EPA 2008c).

Due to the enforcement history at the Art Brass facility, atmospheric deposition is considered a potential pathway of contamination.

4.3.2.5 Data Gaps

The following data gaps have been identified for the Art Brass Plating property. These should be addressed to facilitate effective source control via the groundwater pathway for the RM 1.2-1.7 East source control area.

- Information is needed from the RI currently being implemented to assess the status of the confirmed groundwater and soil contamination.
- Further details are needed about the permitted spray booth.
- Follow-up information is needed on the compliance issues found during the King County industrial waste field inspections.

4.3.3 Blaser Die Casting

Facility Summary: Blaser Die Casting	
Address	5700 3rd Avenue South
Property Owner	Orcas Foley LLC
Former/Alternative Property Names	Blaser Tool & Mold Co.
Former/Alternative Lessee/Operator Names (Shop Building)	Scougal Rubber Corporation
Former/Alternative Addresses	N/A
Tax Parcel No.	1722801495
Parcel Size	0.89 acres
NPDES Permit No.	N/A
EPA RCRA ID No.	N/A
EPA TRI Facility ID No.	N/A
Ecology Facility/Site ID No.	7118747
Ecology UST Site ID No.	N/A
Ecology LUST Release ID No.	N/A
Listed on Ecology CSCSL	Yes
EPA CAA ID No.	N/A
KCIW Permit No.	N/A

Blaser Die Casting (Blaser) is east of the LDW, and is bordered on the north by South Orcas Street and on the south by South Mead Street. Capital Industries borders the property to the southeast and 3rd Avenue borders the property to the east (Figure 18).

According to King County tax records, Blaser is on tax parcel No. 1722801495 and is listed under the address 5700 3rd Avenue South (King County 2008a).

The most recent property sales record listed in King County's tax records indicates that Orcas Foley LLC purchased tax parcel 1722801495 from Scougal Rubber Corporation on December 4, 1996. The current owner of the tax parcel is listed as "Orcas Foley, LLC." Three structures are listed as located on the parcel, including a 12,818-square-foot shop/warehouse built in 1966, a 10,050-square-foot storage warehouse built in 1982, and a 4,800-square-foot storage warehouse built in 1972. According to King County tax records, the current property name of tax parcel 1722801492 is Blaser Tool and Mold Co. (King County 2008a).

4.3.3.1 Current Operations

Blaser is located within the Georgetown neighborhood of Seattle and within an area of known groundwater contamination. Within this area there have been several chlorinated-solvent-contaminated sites, including the Blaser Die Casting facility. Blaser Die Casting uses raw materials such as zinc ingots (96.5% pure zinc), which are melted and poured into molds. Blaser uses machine oil for lubrication and has water-based hydraulic lifts (PGG 2008).

4.3.3.2 Historical Use

Blaser Die Casting has occupied its present location since 1962 and employs approximately 50 people. Before 1962, the property was residential or unoccupied. Further information related to the historical use of the Blaser Die Casting Facility was not available for review.

4.3.3.3 Environmental Investigations and Cleanup Activities

Previous investigations by PGG have assessed the nature and extent of contamination in soil and groundwater at the Blaser Die Casting site. A soil source control action was finished in January

2008 and reported to Ecology. The source control action included excavation and disposal of 1,200 tons of soil and 7,250 gallons of groundwater at Blaser's southwest corner due to contamination of TCE and its degradation products. The excavation extended into groundwater, removing soil at the capillary fringe. Groundwater contamination is expected to decrease in concentration and in lateral and vertical extent as a result of source control. The source of contamination is uncertain

Blaser is currently monitoring groundwater to the southwest from the former soil source area. A review of site processes provided no evidence that TCE had ever been used by Blaser or that TCE was ever used at the property as a part of Blaser's manufacturing process (PGG 2008).

Vertical profiling of groundwater quality indicates that groundwater contamination at the Blaser site has a shallow vertical extent. Further, the Blaser groundwater plume is vertically distinct from a deeper groundwater plume that originates upgradient from Blaser (PGG 2008).

4.3.3.4 Potential Pathways of Contamination

Groundwater

Blaser Die Casting was entered into Ecology's CSCSL on November 30, 2005, and is listed as having confirmed groundwater, soil, and air contamination. Confirmed contaminants in soil, groundwater, and air are identified as halogenated organic compounds. Blaser's status is given as "awaiting site hazard assessment" (Ecology 2008e). Until remediation is complete, groundwater migrating from the Blaser Die Casting facility is a potential pathway of contamination.

Spills

Spills from industrial activities taking place at this site are a potential pathway of contamination to reach the combined King County sewer system, which could overflow to the LDW during a CSO event. If allowed to percolate into the ground, spills could also lead to further groundwater contamination.

4.3.3.5 Data Gaps

- Information is needed from the final remedial investigation that is currently taking place at the Blaser Die Facility to assess the current status of groundwater contamination including its potential source or sources as well as the nature and extents.

4.3.4 Capital Industries Inc.

Capital Industries, Inc.(Capital) is east of the LDW, south of South Mead Street, and north of South Fidalgo Street. To the east of the Capital property is 4th Avenue South, and to the west is 1st Avenue South. According to King County tax records, the Capital property encompasses three contiguous tax parcels listed as 1722802255 (5801 3rd Avenue South), 1722801620 (5801 3rd Ave South), and 1722802245 (5820 1st Ave South) (Figure 18). These tax parcels total 3.8 acres. The most recent property sales record listed in King County's tax record indicates that tax parcel 1722801620 was purchased by Capital from Ronald S. Taylor on February 17, 1989. Tax parcel 1722802245 was purchased by Capital from Henry T. Chinn on November 11, 1998, and there is no information on the sale transfer of tax parcel 1722802255 (King County 2008a).

Facility Summary: Capital Industries	
Address	5801 3rd Avenue South, Seattle, Wa.
Property Owner	Capital Industries, Inc.
Former/Alternative Property Names	N/A
Former/Alternative Lessee/Operator Names	N/A
Former/Alternative Addresses	N/A
Tax Parcel No.	1722801620, 1722802245, 1722802255
Parcel Size	166,468 square feet
NPDES Permit No.	N/A
EPA RCRA ID No.	WAD009245465
EPA TRI Facility ID No.	98108CPTLN58013
Ecology Facility/Site ID No.	11598755
Ecology UST Site ID No.	N/A
Ecology LUST Release ID No.	N/A
Listed on Ecology CSCSL	Yes
KCIW Permit No.	N/A

The four buildings included within tax parcel 1722801620 include a 44,445-square-foot office building built in 2004, a 19,800-square-foot metal fabrication building built in 1973, a 60,000-square-foot metal fabrication building, and a 11,099-square-foot building made of structural steel located west of the office building (Figure 24) (King County 2008a).

Within parcel no. 1722802255, there is a 32,040-square-foot storage warehouse that was built in 1980. On parcel No. 1722802245, located at 5820 1st Avenue South, there is an 11,700-square-foot press manufacturing building built in 2005.

4.3.4.1 Current Operations

Capital is a metal fabrication and painting facility. Services offered include forming, shearing, laser cutting, punching, welding, and rolling (Capital Industries 2008).

4.3.4.2 Historical Use

Based on a review of historical records, including Sanborn Fire Insurance Maps and city directories, Capital has occupied its current location since 1965. Before then, the property was primarily residential. The Capital property has been operated exclusively for metal fabrication and related work since 1965 (Farallon 2008).

According to the release reports for Capital in EPA's TRI database, methyl isobutyl ketone compounds were listed for 1995-1999. TCE compounds were listed for 1989-1991 and toluene compounds were listed for 1988-1994. Xylene compounds were listed for 1988-1997. All releases listed for Capital are defined by the EPA's TRI database as "onsite disposal or other releases which include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells" (EPA 2008a).

According to the Waste Quantity Reports for Capital Industries, methyl isobutyl ketone compounds were listed for 1995-1999 and TCE compounds were listed for 1991. Toluene compounds were listed for 1991-1994 and xylene was listed for 1991-1998. According to the EPA's TRI database, these compounds included "the total amount of toxic chemicals recycled onsite, recycled offsite, and treated offsite" (EPA 2008a). TRI data for Capital Industries is summarized in Tables B-10 through B-12 in Appendix B.

4.3.4.3 Environmental Investigations and Cleanup Activities

Several Investigations at the Capital property were conducted between January 2004 and May 2007 after Capital Plant 2 (Figure 24) was destroyed by fire in January 2004. These investigations included sub-slab soil vapor sampling and analysis, soil vapor and construction monitoring during redevelopment, and three phases of subsurface investigations. The subsurface investigations evaluated the nature and extent of halogenated volatile organic compounds (HVOCs) in soil and groundwater. The extents of contamination were investigated both up and down gradient of the Capital property.

The subsurface investigations conducted to date at the Capital property by Farallon and others have been performed as independent actions. Concentrations of HVOCs such as TCE, tetrachloroethene (PCE), cis-1,2-DCE, and VC have been detected in groundwater at or above the PSC screening levels at the Capital property. Concentrations of PCE and TCE have been detected in soil above the screening levels at Plant 4 only.

4.3.4.4 Potential Pathways of Contamination

Groundwater

Capital Industries was entered into Ecology's CSCSL on October 4, 2006, and is listed as having air, soil, and groundwater contamination. Confirmed contaminants in soil, groundwater, and air are halogenated organic compounds. Status of this site is currently listed as "Awaiting Site Hazard Assessment" (Ecology 2008e). Groundwater is considered a potential pathway for contaminants to reach LDW sediments.

Spills

Spills from industrial activities taking place at this site are a potential pathway for contaminants to reach the combined sewer system, which could overflow to the LDW during a CSO event. If allowed to percolate into the ground, spills could also lead to further groundwater contamination.

Atmospheric Deposition

According to EPA's ECHO database, Capital Industries has a minor (non-federally reportable) operating permit. Its CAA ID No. is 5303300385. The last CAA inspection was on July 27, 2007, and there have been no formal enforcements within the last five years. The last RCRA inspection was conducted on November 16, 2007, and no formal enforcements have been listed within the last five years (EPA 2008c). Because there is a history of contamination via atmospheric deposition, this is considered a potential pathway of contaminants to LDW sediments.

4.3.4.5 Data Gap

The following data gap has been identified for Capital Industries. This data gap should be addressed before source control efforts begin for the RM 1.2-1.7 East source control area.

- Because the remedial investigation for Capital Industries has not yet been completed, information about possible sources within the Capital property is lacking. The groundwater contamination cannot be assessed until the remedial investigation is complete.

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6.0 Tables

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Table 1
Contaminants Above Screening Levels in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
Metals and Trace Elements														
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Zinc	1500	mg/kg dw		2.04		410	960	mg/kg dw	3.7	1.6
PAHs														
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Chrysene	4.1	mg/kg dw		1.48	280	110	460	mg/kg OC	2.5	0.61
PCBs														
DR144	1.5	EPA SI	8/17/1998	PCBs (total calc'd)	0.308	mg/kg dw		1.84	16.7	12	65	mg/kg OC	1.4	0.26
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.69	mg/kg dw		1.01	68	12	65	mg/kg OC	5.7	1.0
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	PCBs (total calc'd)	0.25	mg/kg dw	J	1.08	23	12	65	mg/kg OC	1.9	0.35
B4b	1.4	LDWRI-Benthic	8/28/2004	PCBs (total calc'd)	0.4	mg/kg dw		2.79	14	12	65	mg/kg OC	1.2	0.22
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	PCBs (total calc'd)	0.27	mg/kg dw		2.11	13	12	65	mg/kg OC	1.1	0.2
Other SVOCs														
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzyl alcohol	70	ug/kg dw	J	2.79		57	73	ug/kg dw	1.2	0.96
DR092	1.6	EPA SI	8/27/1998	Phenol	520	ug/kg dw		0.7		420	1200	ug/kg dw	1.2	0.43

Key:

AET - Apparent Effects Threshold
DW - Dry weight
CSL - Cleanup Screening Level
PAH - Polynuclear aromatic hydrocarbon
PCB - Polychlorinated biphenyl
OC - Organic carbon
TOC - Total organic carbon
SQS - Sediment Quality Standard
SVOC - Semivolatile organic compound

Notes:

1. SQS and CSL values are substituted with AET values for dry weight comparison where organic compounds are not OC-normalized (when TOC % DW is outside of the 0.5-4.0% range).
2. Exceedance factors are the ratio of the detected concentration to the CSL or SQS (or to AET values where applicable); exceedance factors are shown only if they are greater than 1.

Source:

Lower Duwamish Waterway Group, 2007. Online Lower Duwamish Waterway Group Draft Remedial Investigation Report (November 2007) Database. http://www.ldwg.org.

Table 2
Contaminants Above Screening Levels in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
Metals and Trace Elements															
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Mercury	0.52	mg/kg dw		2.24		0.41	0.59	mg/kg dw	1.3	0.88
PAHs															
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.57	mg/kg dw		1.39	41	16	57	mg/kg OC	2.6	0.72
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthene	1.5	mg/kg dw		2.29	66	16	57	mg/kg OC	4.1	1.2
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthene	2.1	mg/kg dw		1.3	160	16	57	mg/kg OC	10	2.8
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Anthracene	8.8	mg/kg dw		1.3	680	220	1200	mg/kg OC	3.1	0.57
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	3.2	mg/kg dw		2.14	150	110	270	mg/kg OC	1.4	0.56
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	2.7	mg/kg dw		2.29	120	110	270	mg/kg OC	1.1	0.44
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	7.1	mg/kg dw		1.3	550	110	270	mg/kg OC	5	2
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	2.5	mg/kg dw		2.14	120	99	210	mg/kg OC	1.2	0.57
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	3	mg/kg dw		1.3	230	99	210	mg/kg OC	2.3	1.1
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.73	mg/kg dw		1.3	56	31	78	mg/kg OC	1.8	0.72
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	6	mg/kg dw		2.14	280	230	450	mg/kg OC	1.2	0.62
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	6.4	mg/kg dw		1.3	490	230	450	mg/kg OC	2.1	1.1
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	7.2	mg/kg dw		2.14	340	110	460	mg/kg OC	3.1	0.74
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	3.1	mg/kg dw		2.29	140	110	460	mg/kg OC	1.3	0.3
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	7.8	mg/kg dw		1.3	600	110	460	mg/kg OC	5.5	1.3
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.18	mg/kg dw		1.3	14	12	33	mg/kg OC	1.2	0.42
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.65	mg/kg dw		1.3	50	15	58	mg/kg OC	3.3	0.86
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	7.4	mg/kg dw	J	2.14	350	160	1200	mg/kg OC	2.2	0.29
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	10	mg/kg dw		2.29	440	160	1200	mg/kg OC	2.8	0.37
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	24	mg/kg dw		1.3	1800	160	1200	mg/kg OC	11	1.5
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluorene	1.8	mg/kg dw		1.3	140	23	79	mg/kg OC	6.1	1.8
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.93	mg/kg dw		1.3	72	34	88	mg/kg OC	2.1	0.82
C	1.7	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	2.2	mg/kg dw		1.9	120	100	480	mg/kg OC	1.2	0.25
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Phenanthrene	12	mg/kg dw		1.3	920	100	480	mg/kg OC	9.2	1.9
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Pyrene	14	mg/kg dw		1.3	1100	1000	1400	mg/kg OC	1.1	0.79
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	31.5	mg/kg dw	J	2.14	1500	960	5300	mg/kg OC	1.6	0.28
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	25	mg/kg dw		2.29	1100	960	5300	mg/kg OC	1.1	0.21
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	64	mg/kg dw		1.3	4900	960	5300	mg/kg OC	5.1	0.92
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	25	mg/kg dw		1.3	1900	370	780	mg/kg OC	5.1	2.4
PCBs															
2	1.6	0 to 4	Hardie Gypsum-1	1998	PCBs (total calc'd)	0.29	mg/kg dw		2.3	13	12	65	mg/kg OC	1.1	0.2
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.37	mg/kg dw		2.52	15	12	65	mg/kg OC	1.3	0.23
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.33	mg/kg dw		2.18	15	12	65	mg/kg OC	1.3	0.23
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.88	mg/kg dw		1.46	60	12	65	mg/kg OC	5	0.92
LDW-SC23	1.2	6 to 8	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.4	mg/kg dw		2.25	18	12	65	mg/kg OC	1.5	0.28
LDW-SC27	1.4	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	2	mg/kg dw		1.8	110	12	65	mg/kg OC	9.2	1.7
LDW-SC27	1.4	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.25	mg/kg dw		1.54	16	12	65	mg/kg OC	1.3	0.25
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	3.3	mg/kg dw		2.24	150	12	65	mg/kg OC	13	2.3
LDW-SC27	1.4	1 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	1.51	mg/kg dw		1.82	83	12	65	mg/kg OC	6.9	1.3
LDW-SC27	1.4	1 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	3.2	mg/kg dw		1.22	260	12	65	mg/kg OC	22	4
LDW-SC27	1.4	2 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.29	mg/kg dw		2.27	13	12	65	mg/kg OC	1.1	0.2
LDW-SC27	1.4	2 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.84	mg/kg dw		2.14	39	12	65	mg/kg OC	3.3	0.6
Phthalates															
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	1.6	mg/kg dw		2.14	75	47	78	mg/kg OC	1.6	0.96
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.78	mg/kg dw		1.3	60	47	78	mg/kg OC	1.3	0.77

Key:

AET - Apparent Effects Threshold
DW - Dry weight
CSL - Cleanup Screening Level
PAH - Polynuclear aromatic hydrocarbon
PCB - Polychlorinated biphenyl
OC - Organic carbon
TOC - Total organic carbon
SQS - Sediment Quality Standard

Notes:

1. SQS and CSL values are substituted with AET values for dry weight comparison where organic compounds are not OC-normalized (when TOC % DW is outside of the 0.5-4.0% range).
2. Exceedance factors are the ratio of the detected concentration to the CSL or SQS (or to AET values where applicable); exceedance factors are shown only if they are greater than 1.

Source:

Lower Duwamish Waterway Group, 2007. Online Lower Duwamish Waterway Group Draft Remedial Investigation Report (November 2007) Database. http://www.ldwg.org.

Table 3
Facilities of Concern Identification

Facility Identified	Physical Address	Facility/Site ID NO.	Included/Excluded	Ecology Program
Ace Radiator	311 S BRANDON ST	59441643	Excluded*	Hazwaste - HWG, HWP- All Inactive Toxics-SCS- Inactive
AIR TEC CO PARCEL C	5701 1ST AVE S	57633623	Excluded*	Toxics- LUST,UST,Volclnst-Inactive Toxics-SCS-Active
ALL METAL CO	5610 AIRPORT WAY S	5274463	Excluded*	Watqual- WQGSWI- Active
Art Brass Plating Inc Seattle	5516 3RD AVE S	88531932	Included	Hazwaste- ENFORFNL, HWG, HWP, TIER 2, TRI- Active Toxics- VOLCLNST- Active
BAXTER RUTHERFORD	911 S HOSMER ST	4738343	Excluded*	Toxics- LUST-Inacvtive Toxics-UST-Active
BLASER DIE CASTING CO	5700 3RD AVE S	7118747	Included	Toxics-SCS-Active
BOBS TEXACO SERVICE	5304 1ST AVE S	47157762	Excluded*	Toxics- LUST,UST-Active
Phillips Services Corp	734 S LUCILE ST	47779679	Included	Hazwaste-HWTSDF, HWG, TIER 2, TRI-Inactive HWOTHER-Active Toxics-SCS-Active
Capital Industries Inc	5801 3RD AVE S	11598755	Included	Hazwaste-HWG,HWP-Active Hazwaste-Tier 2, TRI-Inactive SCS-Active
Consolidated Freightways Seattle	6050 E MARGINAL WAY S	54757868	Excluded*	Hazwaste- HWG-Inactive Hazwaste-Tier 2-Active Toxics-LUST, VOLCLNST-Inactive Toxics-SCS,UST-Active
Drive Line Services of Seattle Inc	108 S BRANDON ST	2521	Excluded*	Hazwaste-HWG- Inactive Toxics-IRAP-Inactive
General Electric Aviation Div	220 S DAWSON ST	2522	Excluded*	Hazwaste-HWG, HWP, TRI-Inactive Hazwaste-ENFORFN, Tier 2- Active Toxics-SCS-Active
Miller Paint Company Corson Ave	5959 CORSON AVE S	51945779	Excluded*	Hazwaste-HWG, LIST-Inactive Toxic-UST-Inactive
Mobile Crane Co Inc	5900 2ND AVE S	96851494	Excluded*	Hazwaste-HWG Toxics-LUST, VOLCLNST-Inactive Toxic-UST-Active
OTT REAL ESTATE PROPERTY	5903 1ST AV S	17634	Excluded*	Toxics- IRAP-inactive
PNB BUILDING	707 S ORCAS ST	27585467	Excluded*	Toxic-LUST-Inactive Toxic-UST-Active
SAHLBERG EQUIPMENT	5950 4TH AVE S	2450	Excluded*	Hazwaste- HWG-Inactive Toxics-INDPNDNT- Active
UNION PACIFIC RAILROAD CO DAWSON ST	402 S DAWSON ST	44577768	Excluded*	Hazwaste- HWG-Inactive Hazwaste-HWOTHER, Tier2-Active Waterqual- WQGSWI
Certainteed Gypsum Manufacturing	5931 E MARGINAL WAY S	2253	Included	Hazwaste-HWG-inactive Hazwaste-Tier2- Active Toxic-LUST,USTVOLCLNST-Inactive Waterqual-WQGSWI

Table 3
Facilities of Concern Identification

Facility Identified	Physical Address	Facility/Site ID NO.	Included/Excluded	Ecology Program
Chevron 90636	5940 E MARGINAL WAY S	1792892	Excluded*	Hazwaste-HWG, HWOTHER,Tier2-Inactive Toxic-LUST,UST-Active
Longview Fibre Paper & Packaging Inc	5901 E MARGINAL WAY S	2226	Included	Hazwaste-HWG,HWOTHER-Inactive Hazwaste-Tier2-Active Toxics-LUST,UST,INDPNDNT-Active Waterqual-WQGSWL-Active
Saint Gobain Containers	5801 E MARGINAL WAY S	94925241	Included	Hazwaste-HWG,HWP-Inactive Hazwaste-Tier2,TRI-Active Toxic-LUST,UST-Inactive Waterqual-WQGSWI-Active Airqual-Aqops

* As a precautionary measure, these additional upland facilities were considered as they are listed in Ecology's Facility/Site Database and lie within the general area of groundwater that generally flows to the RM 1.2-1.7 East source control area. Four upland facilities were included for review (see Section 4.3) due to known groundwater contamination that may pose a threat to RM 1.2-1.7 East sediments. However, these excluded facilities were not selected for review as there are no indications that they are contributing to the existing co-mingled plume.

Table 4
Storm Drain Outfall Details

Outfall Identification (Windward, 2007a)	Other Identification According to Facility or Source	Land Owner/Outfall Operator (Windward, 2007a)	Pipe Daimeter/ Construction Material (Windward, 2007a)	Flow Rate* (Windward, 2007a)	Notes from Sources	Permit	Proposed Designation
2007	005 (St Gobain) (CRA, 2006)	King County	18-in CMP	none	King County Storm Drain		public SD
2008	004 (St Gobain) (CRA, 2006)	King County	8 inch steel	none	King County Storm Drain		public SD
2009	003 (St. Gobain) (CRA, 2006)	King County	6-inch ductile	none	King County Storm Drain		public SD
2010	002 (St. Gobain) (CRA, 2006)	King County	6-inch PVC	none	King County Storm Drain		public SD
2011	001 (St. Gobain) (CRA, 2006)	King County	12-inch PVC	none	King County Storm Drain		public SD
2013		Longview Fibre	12-inch concrete	trickle	Direct discharge to LDW	SO3000206D	permitted private SD
2014		James Hardie	24-inch concrete	3 gpm	May also be covered under this permit as an additional overflow outlet	SO3000056D	permitted private SD
2015		James Hardie	N/A	none	Permit transferred to BPD Gupsum in Jan. 2004 with direct discharge to LDW. Ecology database lists three outfalls (Nos. 1 to 3)	SO3000056D	permitted private SD
2016		James Hardie	N/A	none	Permit transferred to BPD Gupsum in Jan. 2004 with direct discharge to LDW. Ecology database lists three outfalls (Nos. 1 to 3)	SO3000056D	permitted private SD
2017		James Hardie	12-inch PVC	none	Permit transferred to BPD Gupsum in Jan. 2004 with direct discharge to LDW. Ecology database lists three outfalls (Nos. 1 to 3)	SO3000056D	permitted private SD

*Visual observations from field survey completed May 16 to 20, 2003, and June 2 to 11, 2003.

7.0 Figures

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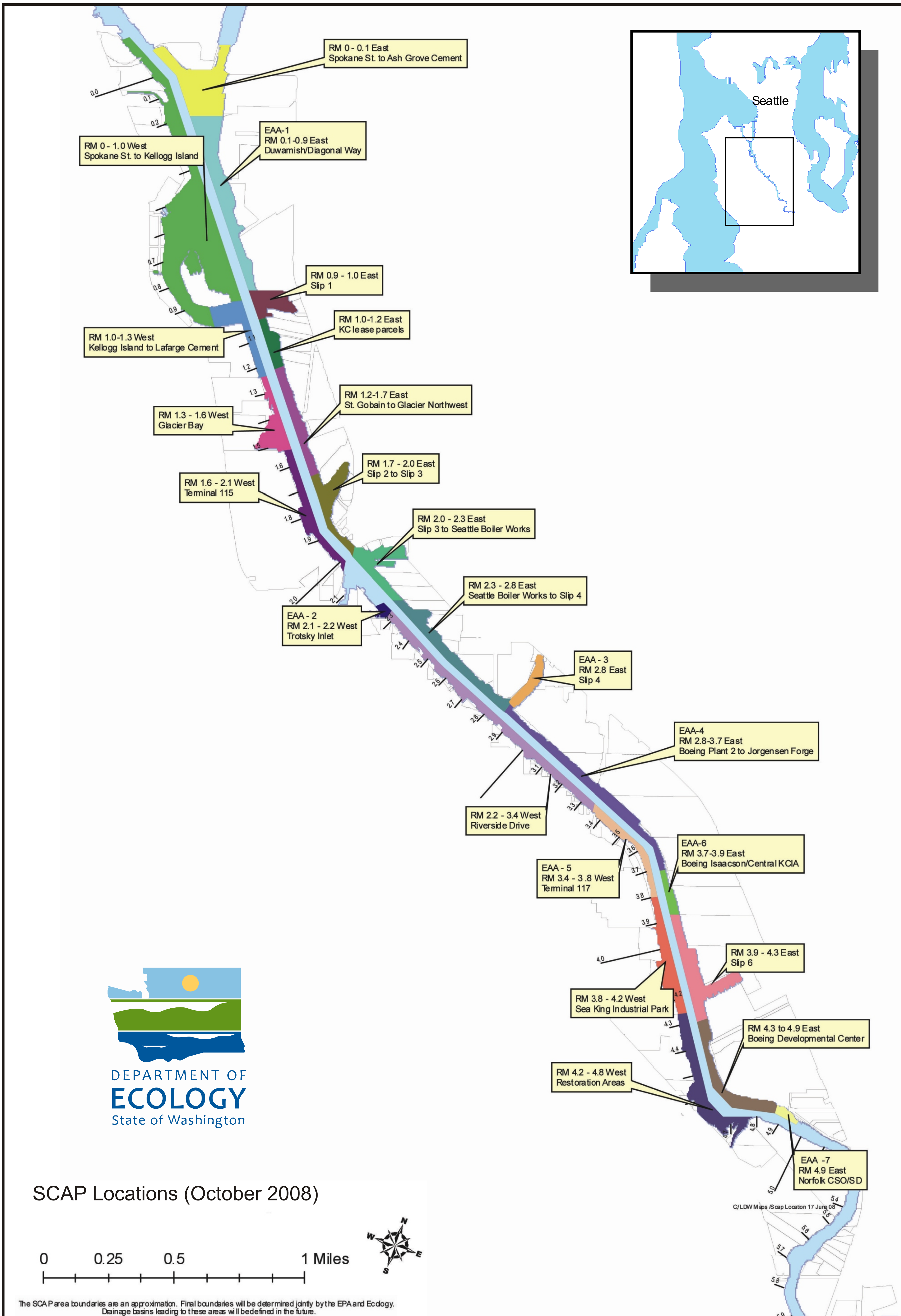
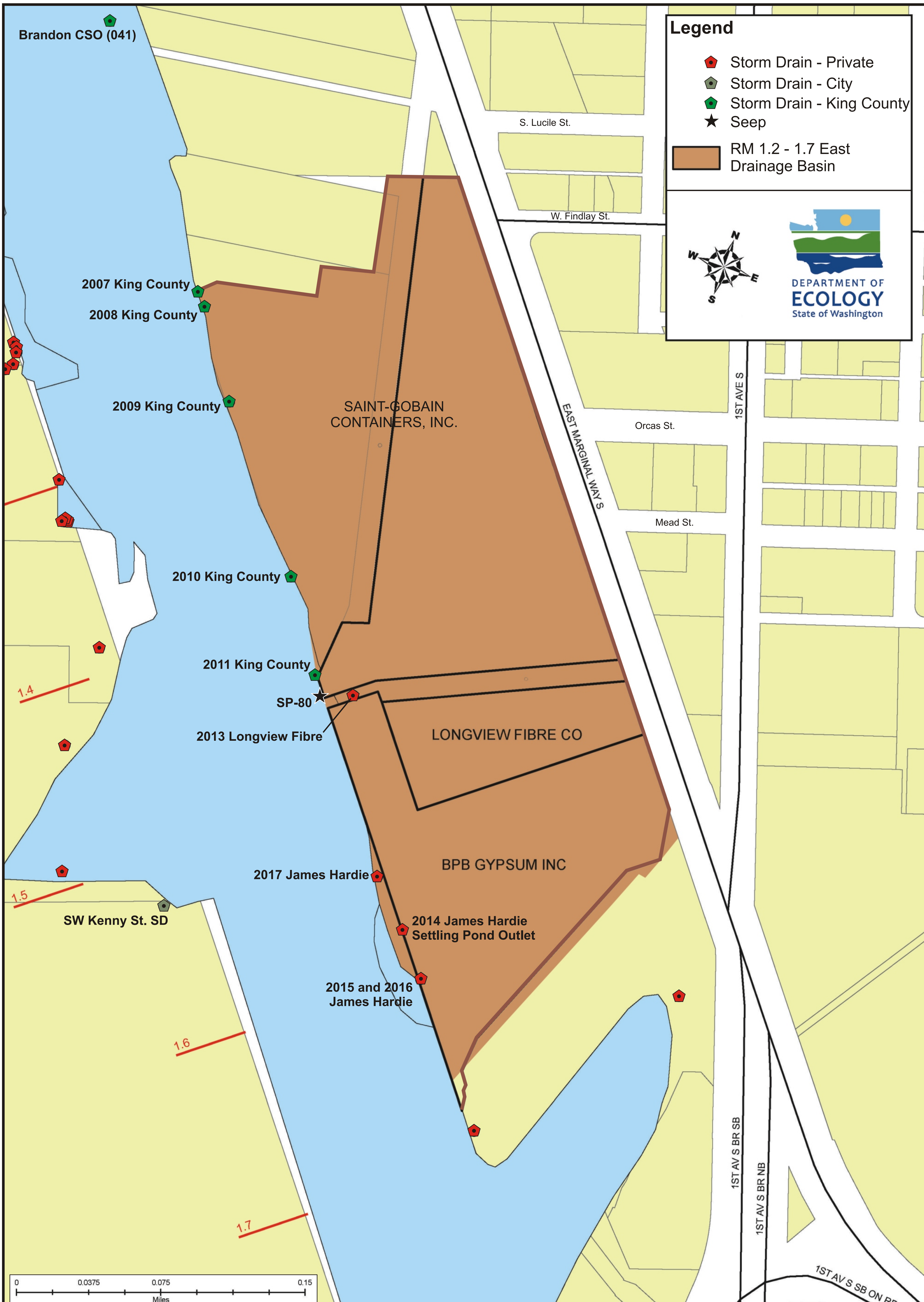


ecology and environment, inc. International Specialists in the Environment Seattle, Washington	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 1 SOURCE CONTROL AREAS
	Base Map Reference: Department of Ecology, 2008.	Date: 1/27/09 | Drawn by: AES | 10:002330WD1404\fig 1



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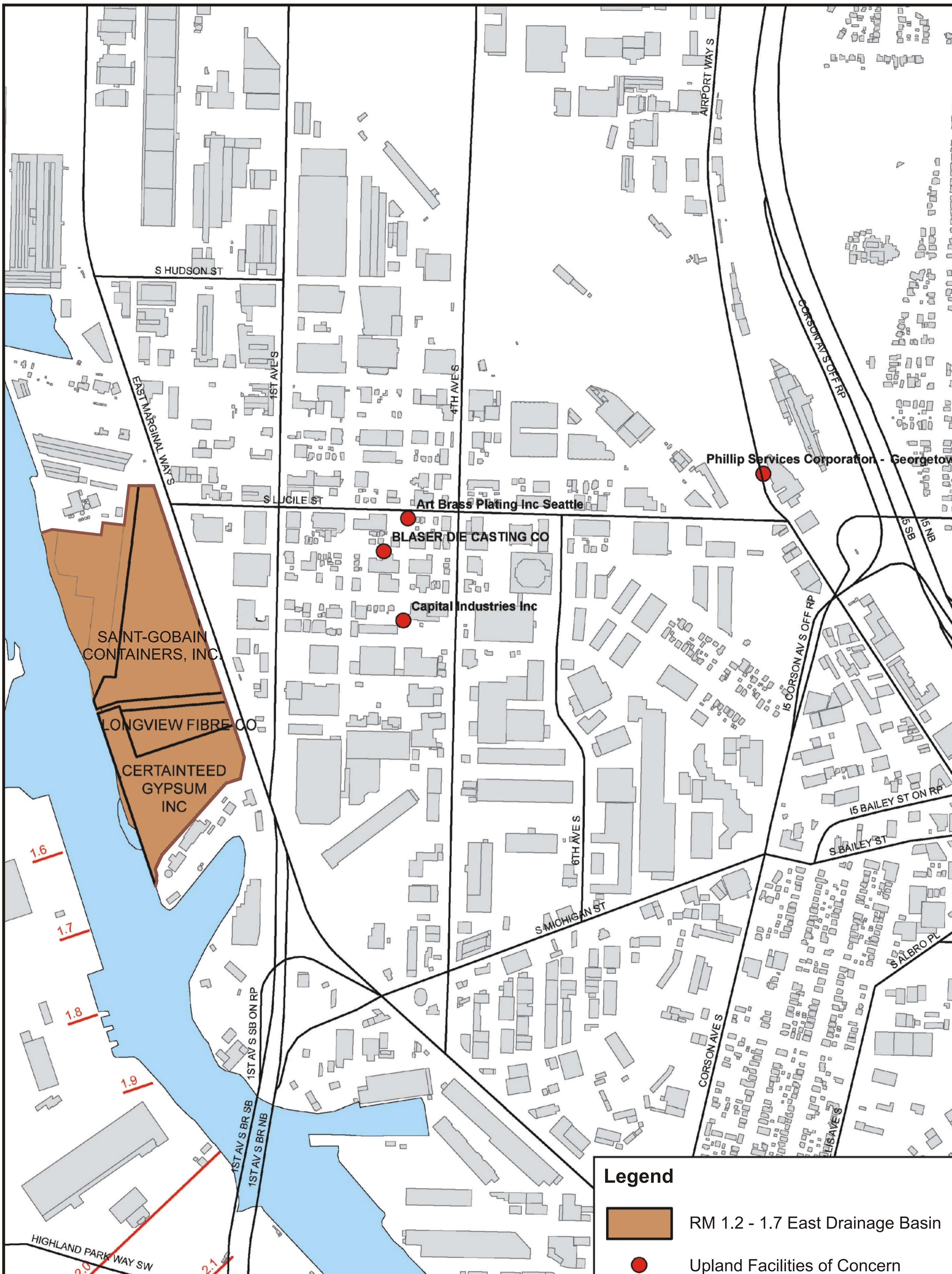
LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 2
RM 1.2-1.7 EAST DRAINAGE BASIN

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 2



DEPARTMENT OF ECOLOGY
State of Washington

Note: Upland property locations are approximate.
See site specific figures for exact locations.

N W E S

0 0.05 0.1 0.2
Miles

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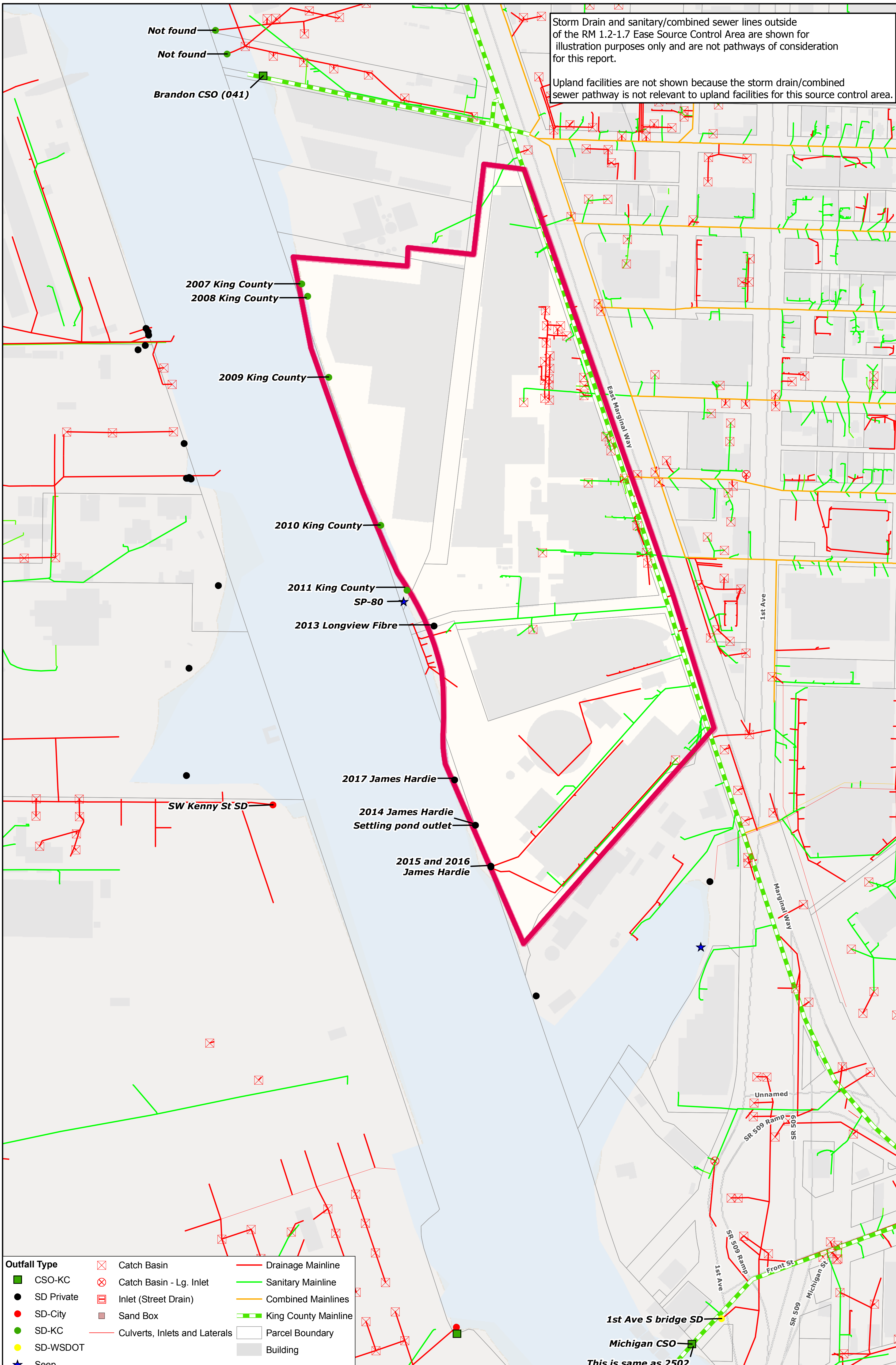
LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 3
RM 1.2-1.7 EAST DRAINAGE BASIN
AND UPLAND FACILITIES

Date:	Drawn by:	
1/27/09	AES	10:002330WD1404\fig 3



0 50 100 200 300 400 Feet
0 25 50 100 150 200 Meters

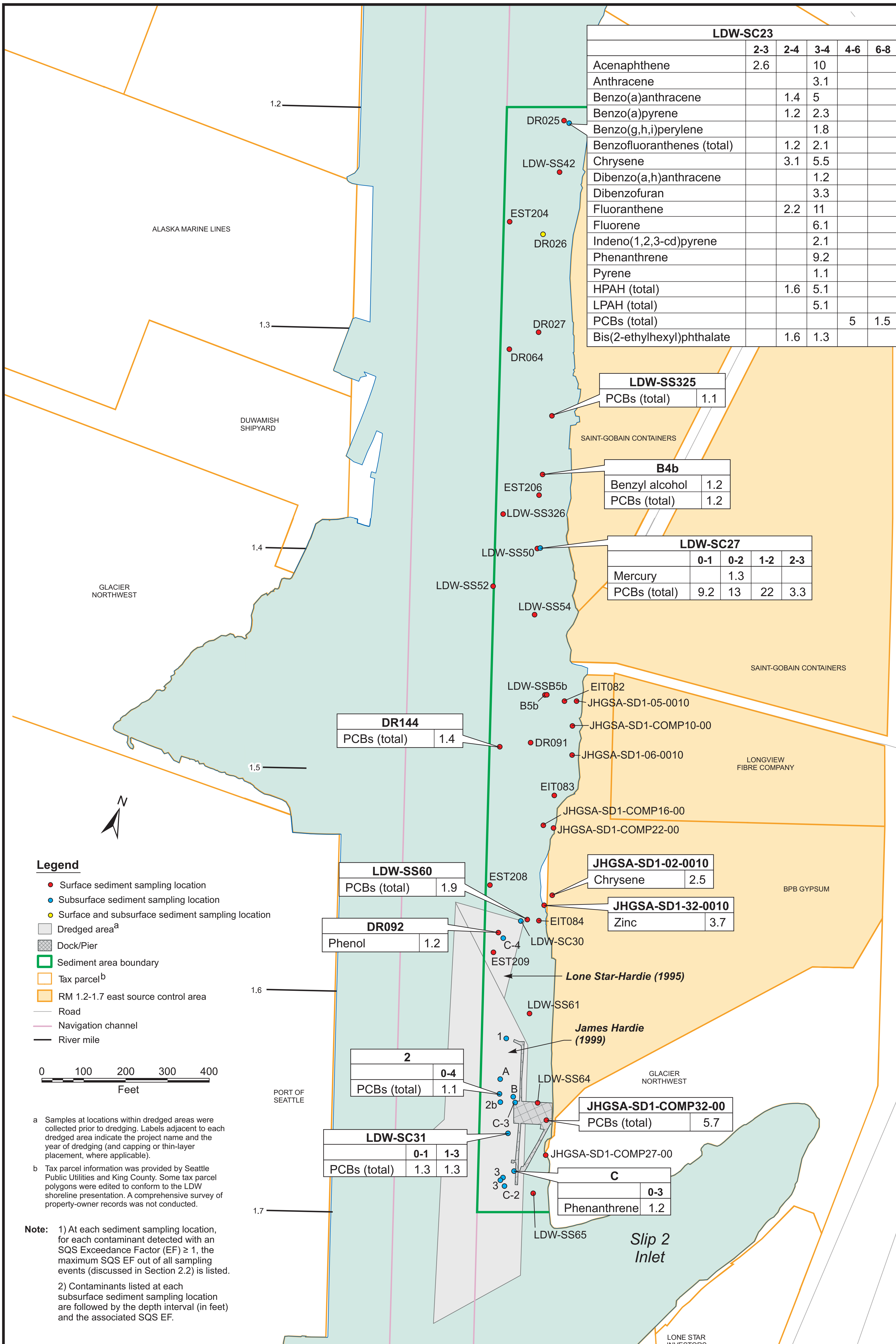
LOWER DUWAMISH WATERWAY
RM 1.2 - 1.7 EAST
Tukwila, Washington

Base Map Reference: E&E GIS Dept.
M:\Seattle\Drainage_Basin_Mapping\Maps\Mxds\RM_1-2_1-7_East

FIGURE 4

STORM DRAIN SYSTEM WITHIN RM 1.2 - 1.7 EAST

Date: 01/12/2009 | Drawn by: RLS | Figure 4.mxd



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LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 5
SEDIMENT SAMPLING LOCATIONS AND ASSOCIATED CONTAMINANTS DETECTED IN EXCEEDANCE OF SQS

Base Map Reference: Windward 2007.

Date: 10/1/08 | Drawn by: AES | 10:002330WD1404\fig 5

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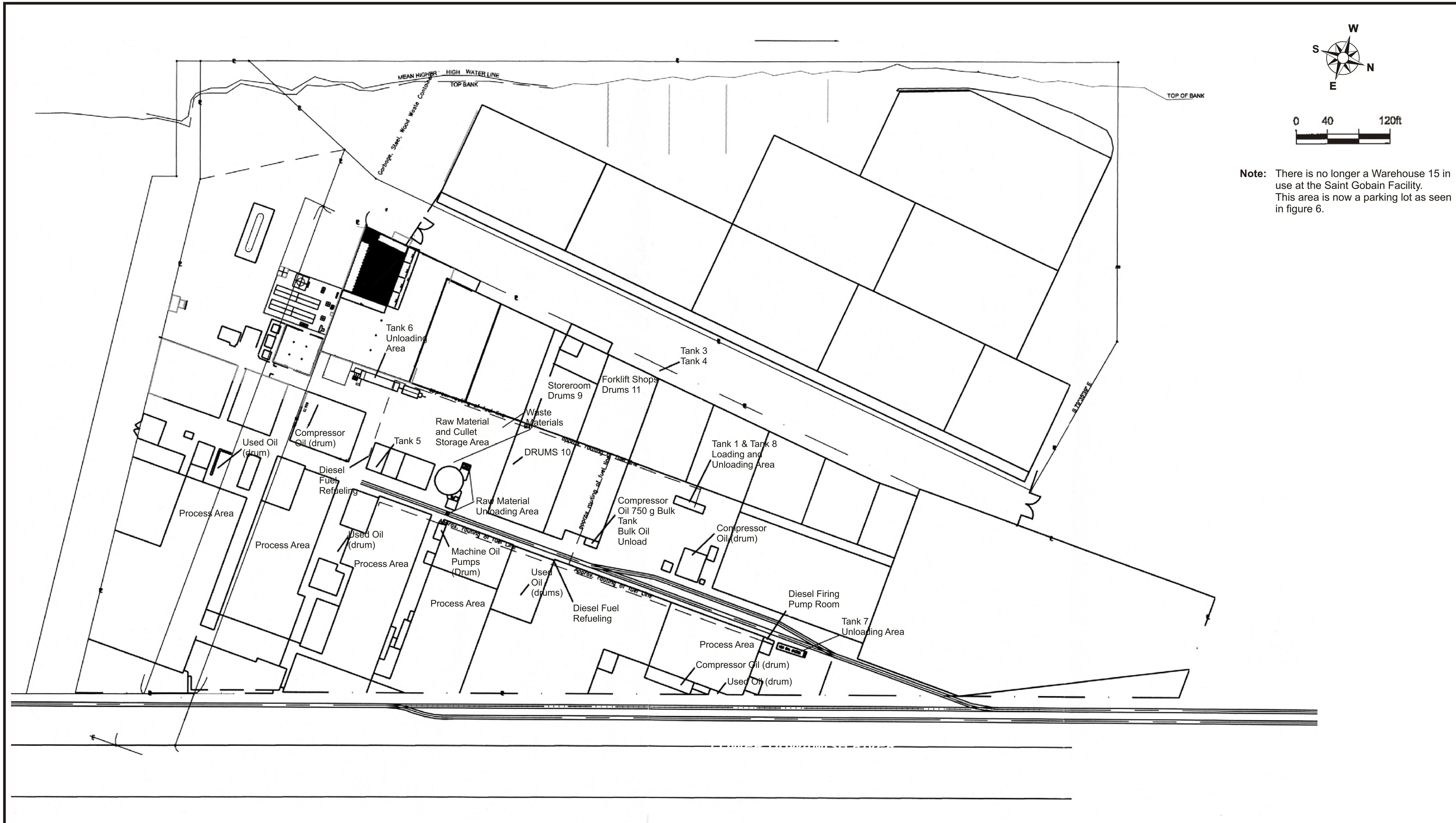
Base Map Reference: Department of Ecology, 2006a.

Note: Property continues on Figure 10.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 6
AERIAL PHOTOGRAPH OF SAINT GOBAIN

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 6



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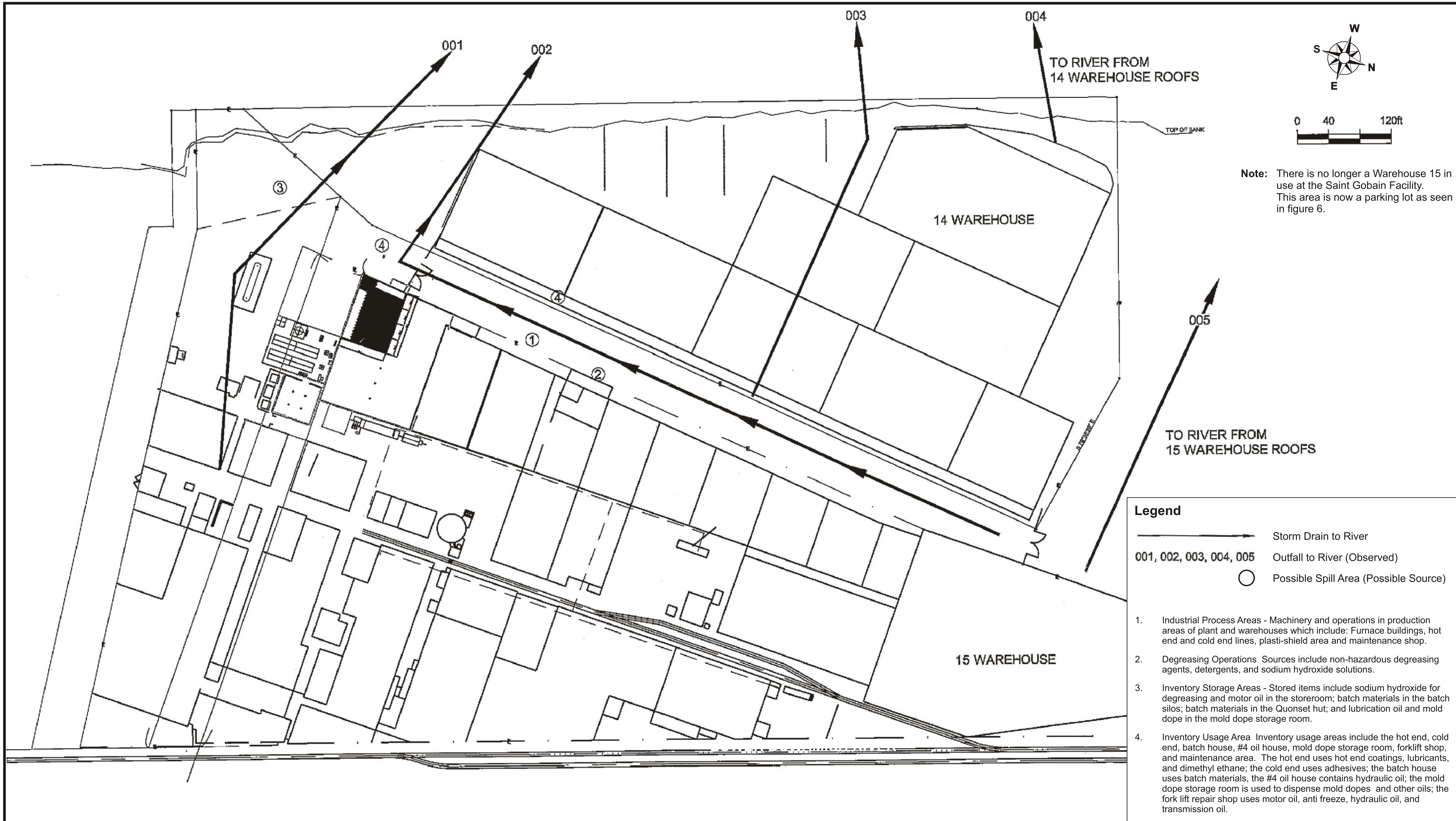
International Specialists in the Environment
Seattle, Washington

Base Map Reference: Conestoga-Rovers & Associates (CRA), 2006a.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 7
SAINT GOBAIN SITE LAYOUT

Date:	Drawn by:	
1/27/09	AES	10:002330WD1404\fig 7



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Seattle, Washington

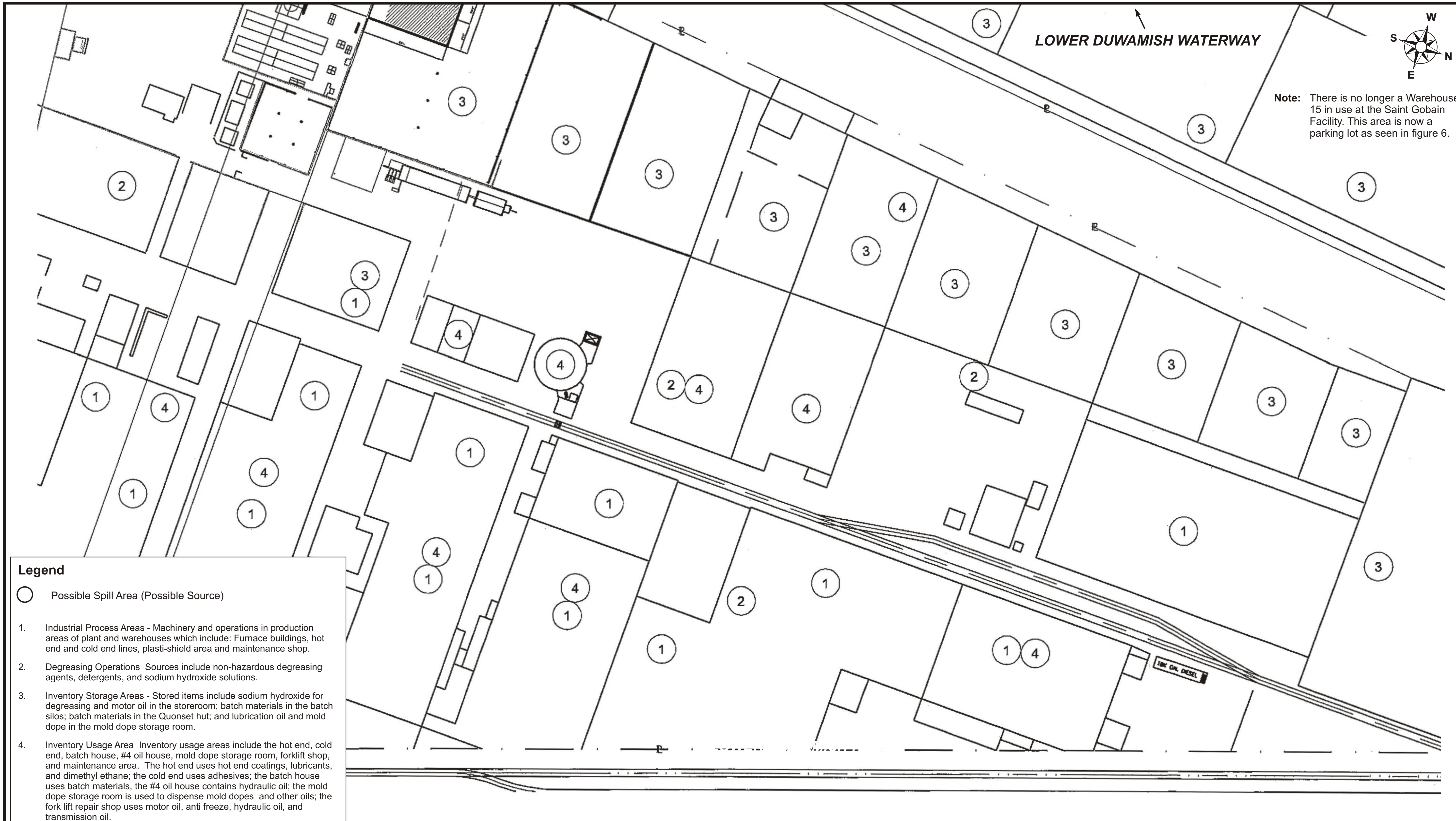
Base Map Reference: Conestoga-Rovers & Associates (CRA), 2006a.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 8

SAINT GOBAIN SITE DRAINAGE

Date:	Drawn by:	
1/27/09	AES	10:002330WD1404\fig 8



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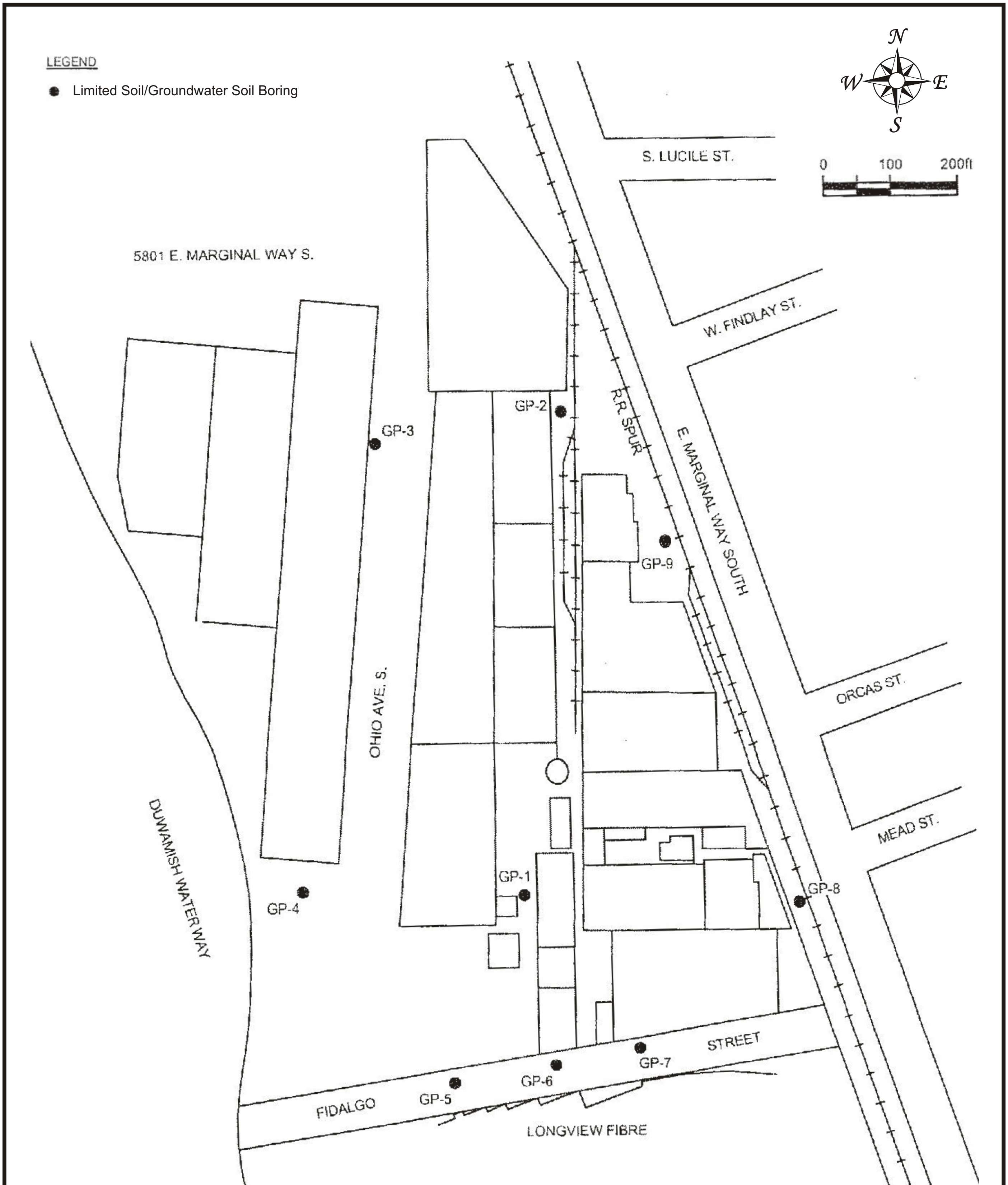
Base Map Reference: Conestoga-Rovers & Associates (CRA), 2006a.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

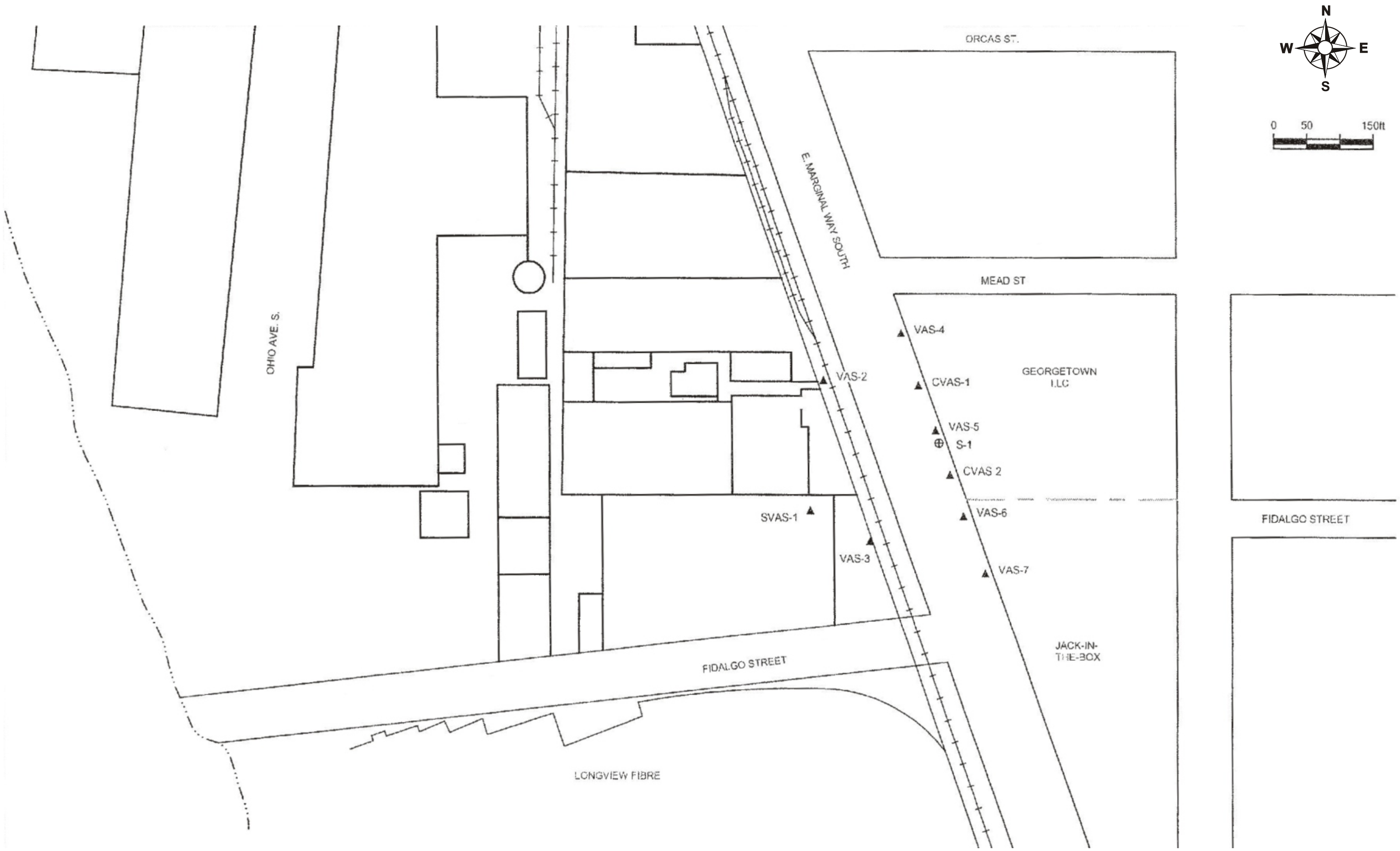
Figure 9

SAINT GOBAIN AREAS OF INDUSTRIAL ACTIVITY

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 9



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 10 LIMITED SOIL/GROUNDWATER INVESTIGATION SAINT-GOBAIN CONTAINERS, INC. SEATTLE, WASHINGTON		
	Base Map Reference: Conestoga-Rovers and Associates (CRA), 2005.	Date: 1-28-09	Drawn by: AES	10:002330WD1404\fig 10



LEGEND

▲ Initial Phase Focused Groundwater Investigation Soil Boring

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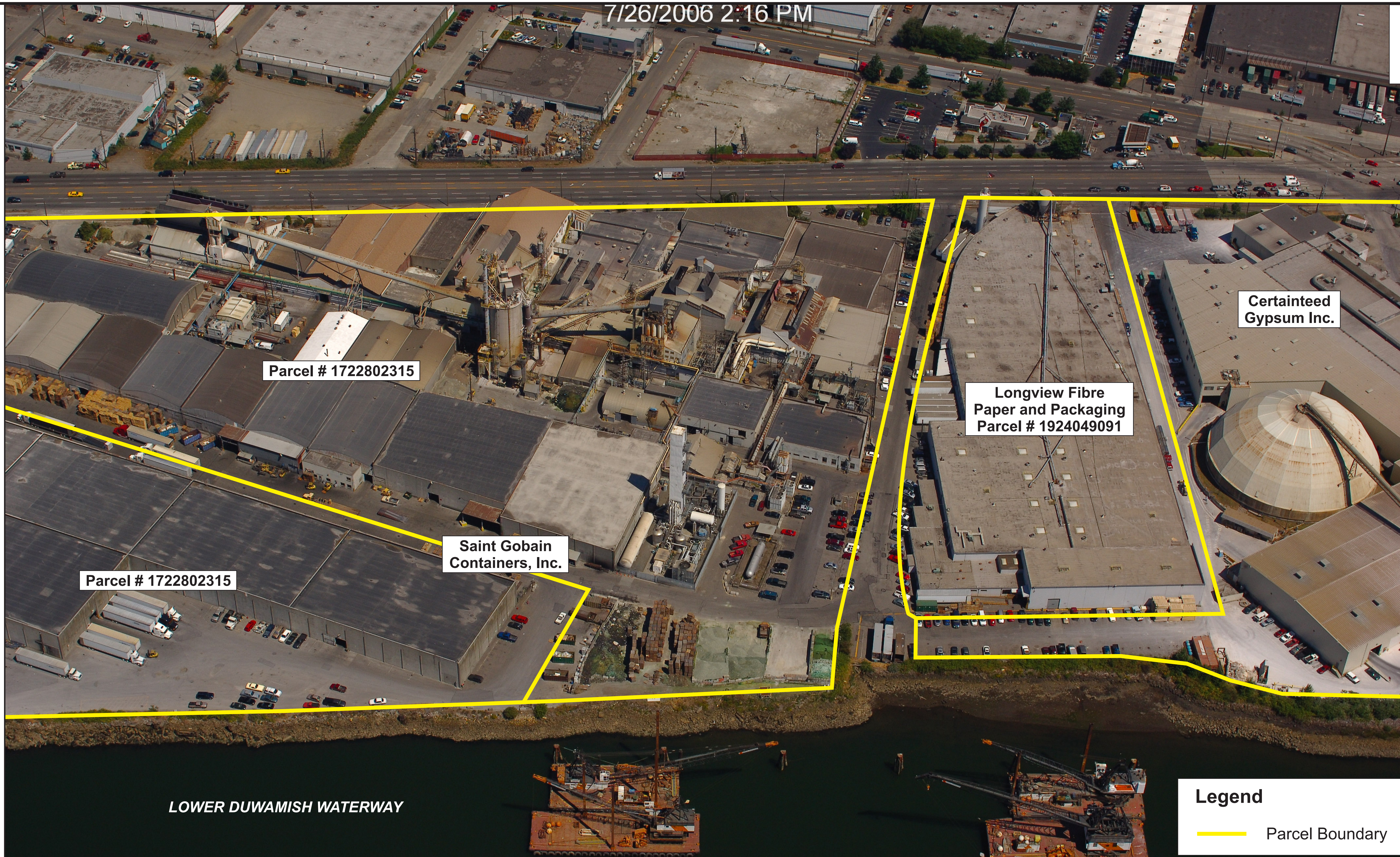
Seattle, Washington

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 11
INITIAL PHASE FOCUSED GROUNDWATER INVESTIGATION
SAINT GOBAIN CONTAINERS, INC., SEATTLE, WASHINGTON

Base Map Reference: Conestoga-Rovers and Associates (CRA), 2005.

Date:	Drawn by:	
2/12/09	AES	10:002330WD1404\fig 11



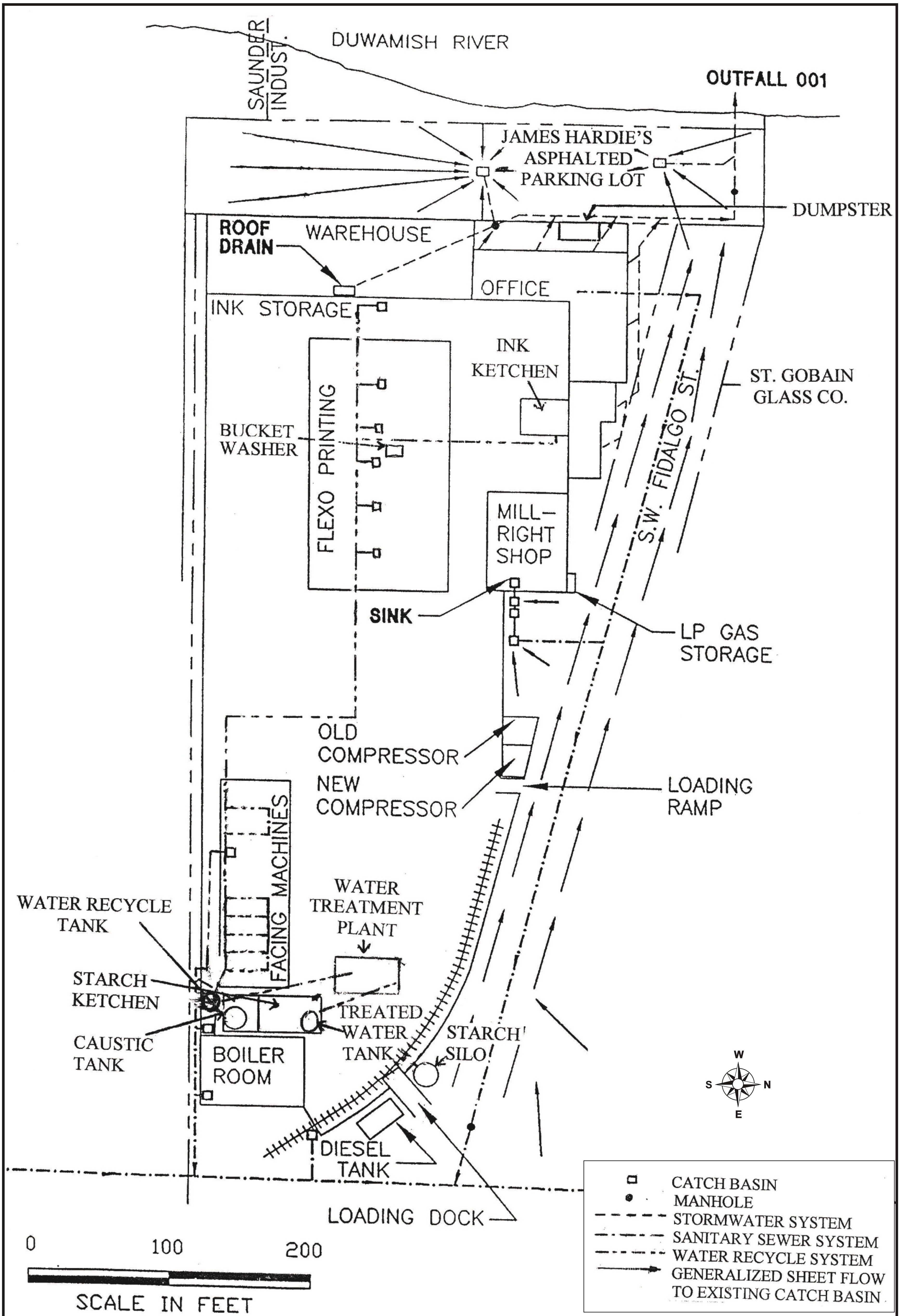
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

Base Map Reference: Department of Ecology, 2006a.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 12
AERIAL PHOTOGRAPH OF
LONGVIEW FIBRE PAPER AND PACKAGING

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 12



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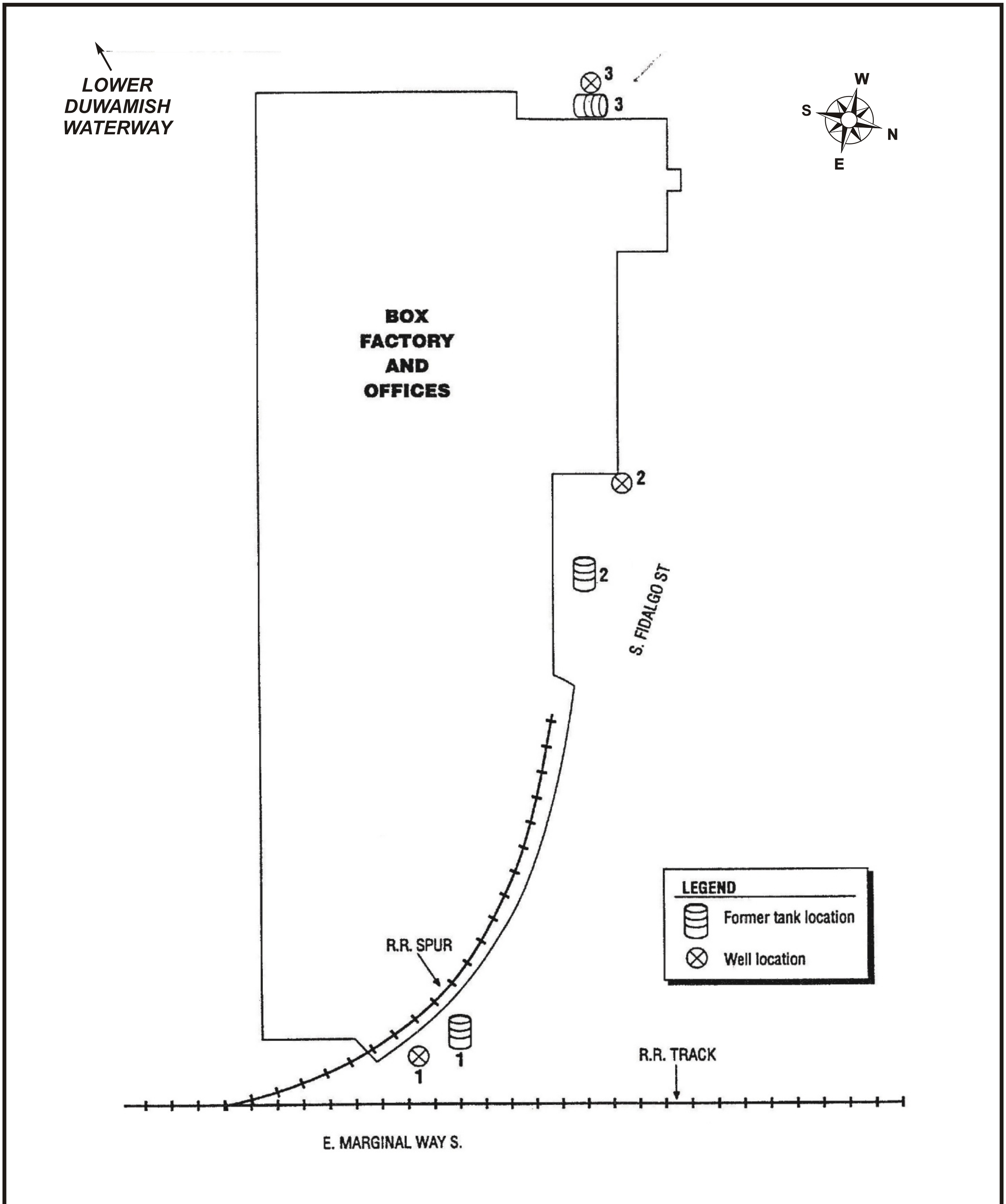
LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Base Map Reference: CH2MHill 1996.

Figure 13
SANITARY SEWER SYSTEM AND SITE LAYOUT FOR LONGVIEW FIBRE

Date:	Drawn by:	
1/27/09	AES	10:002330WD1404\fig 13



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Seattle, Washington

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 14

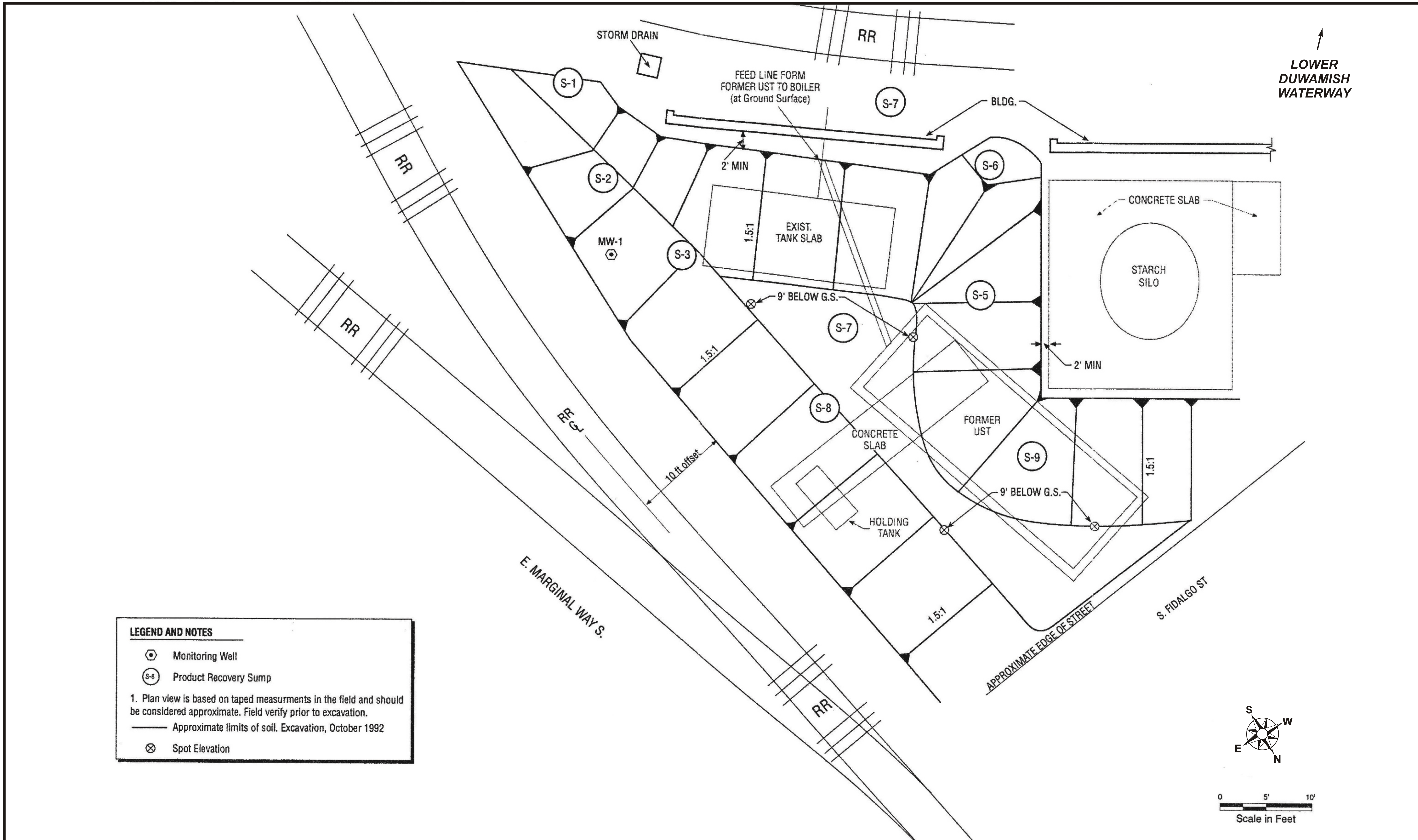
MONITORING WELL LOCATIONS
FOR LONGVIEW FIBRE

Base Map Reference: CH2MHill 1996.

Date: 2-17-09

Drawn by: AES

10:002330WD1404\fig 14



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Seattle, Washington

Base Map Reference: CH2MHill 1996.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 15

SUMP AND UST LOCATIONS FOR LONGVIEW FIBRE

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 15

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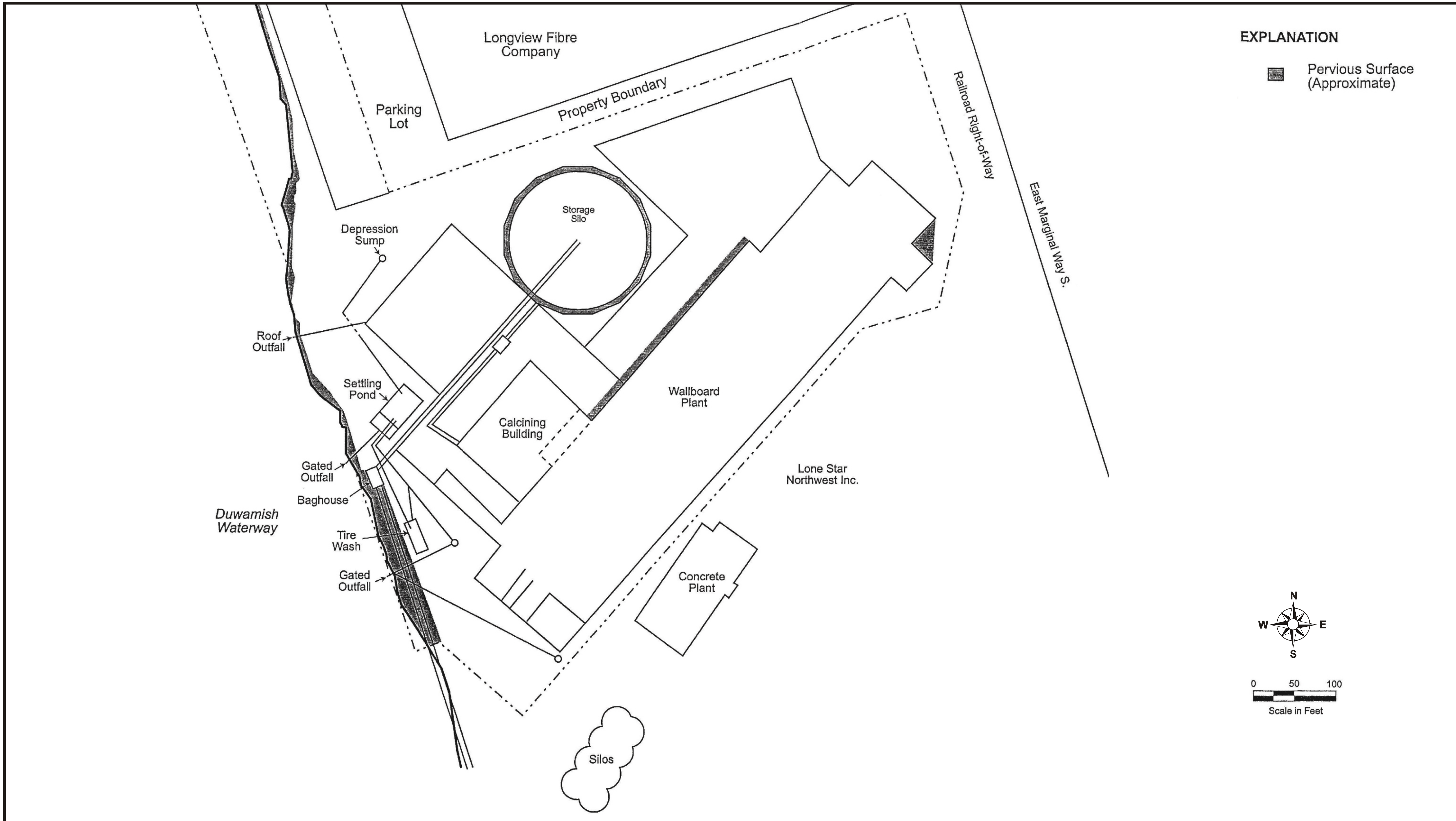
International Specialists in the Environment
Seattle, Washington

Base Map Reference: Department of Ecology, 2006a.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 16
AERIAL PHOTOGRAPH OF
CERTAINTEED GYPSUM

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 16



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

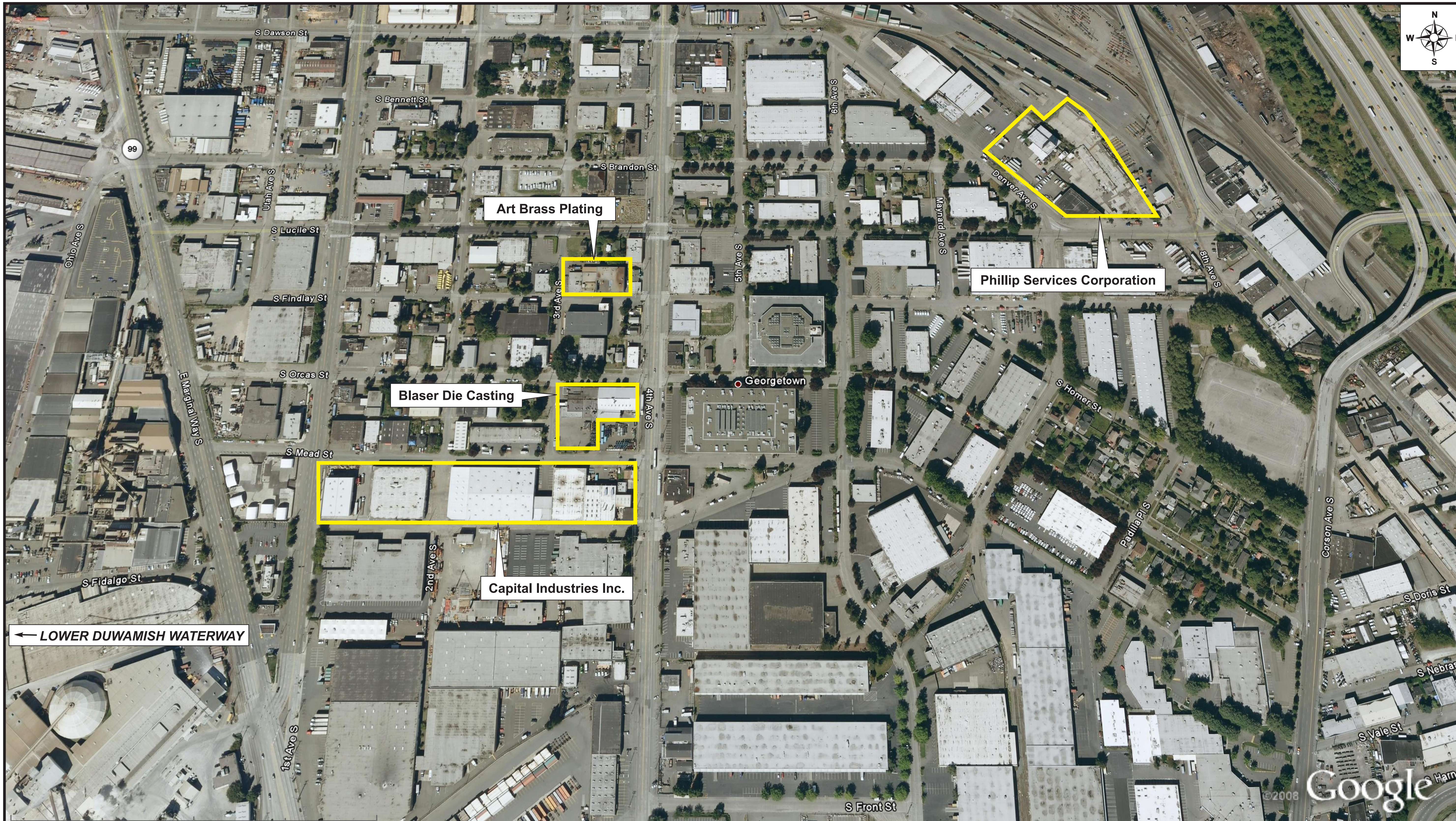
Base Map Reference: Department of Ecology, 2008.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

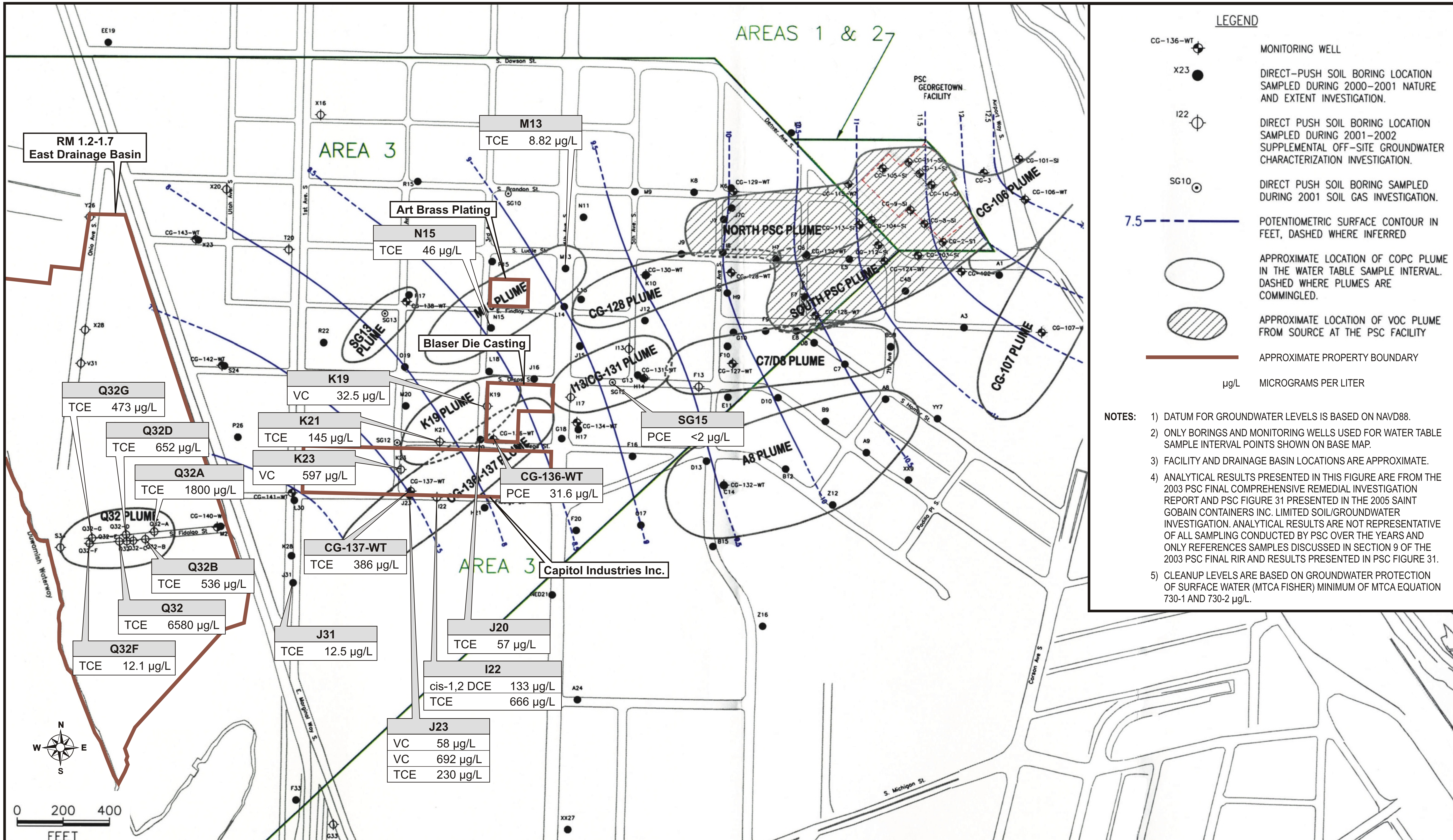
Figure 17

STORM WATER OUTFALLS FOR CERTAINTEED GYPSUM

Date:	Drawn by:	
1/27/09	AES	10:002330WD1404\fig 17



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	**Aerial Photograph Reference:** Google Earth Pro 2008.	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 18 SITE LOCATIONS OF UPLAND PROPERTIES Date: 2/17/09 · Drawn by: AES · 10:002330WD1404\fig 18



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Seattle, Washington

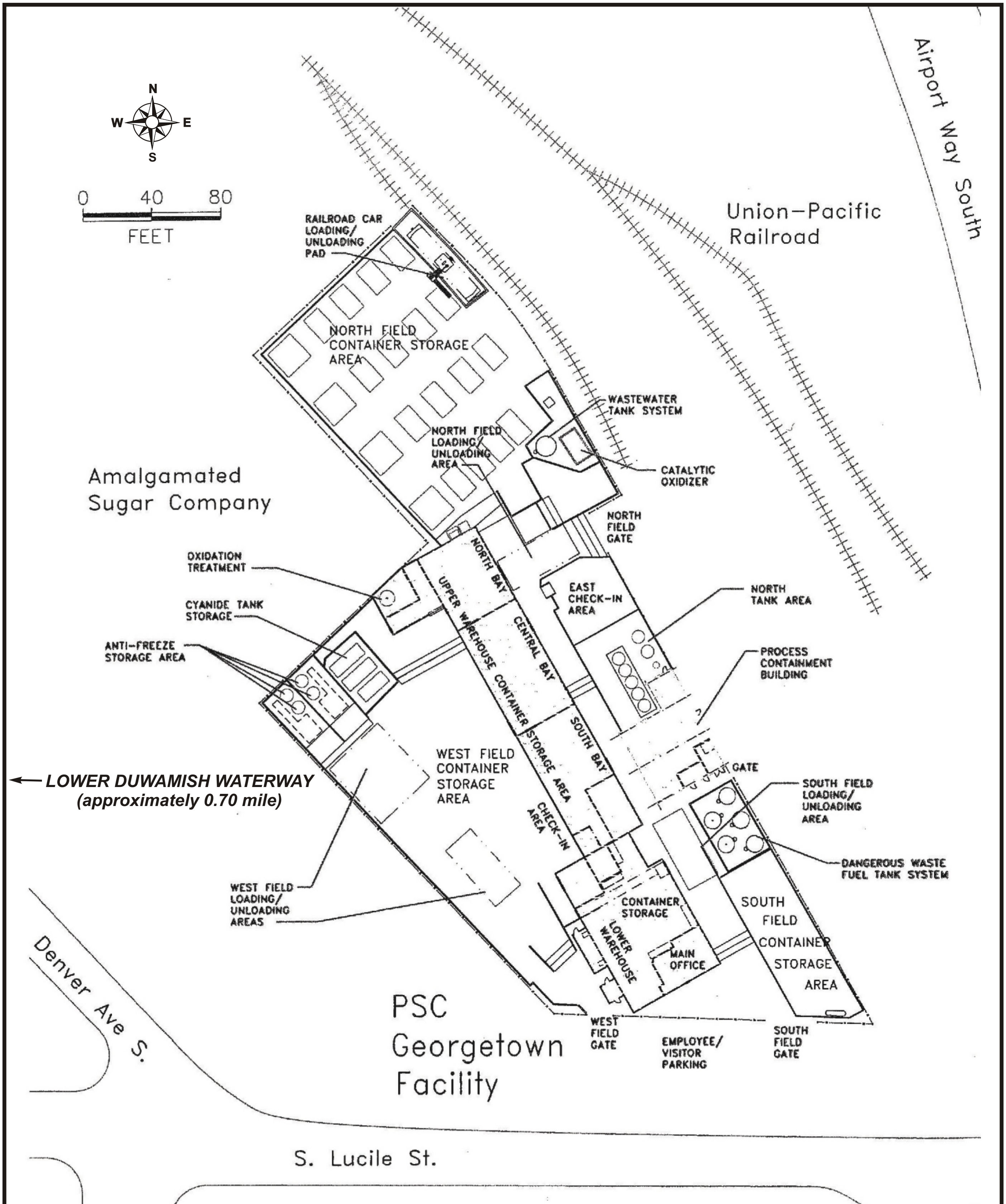
Base Map Reference: Phillip Services Corporation (PSC), 2003.

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Figure 19

CONCENTRATIONS OF VOCS WITHIN RM 1.2-1.7 GROUNDWATER

Date:	Drawn by:	
2/5/09	AES	10:002330WD1404\fig 19



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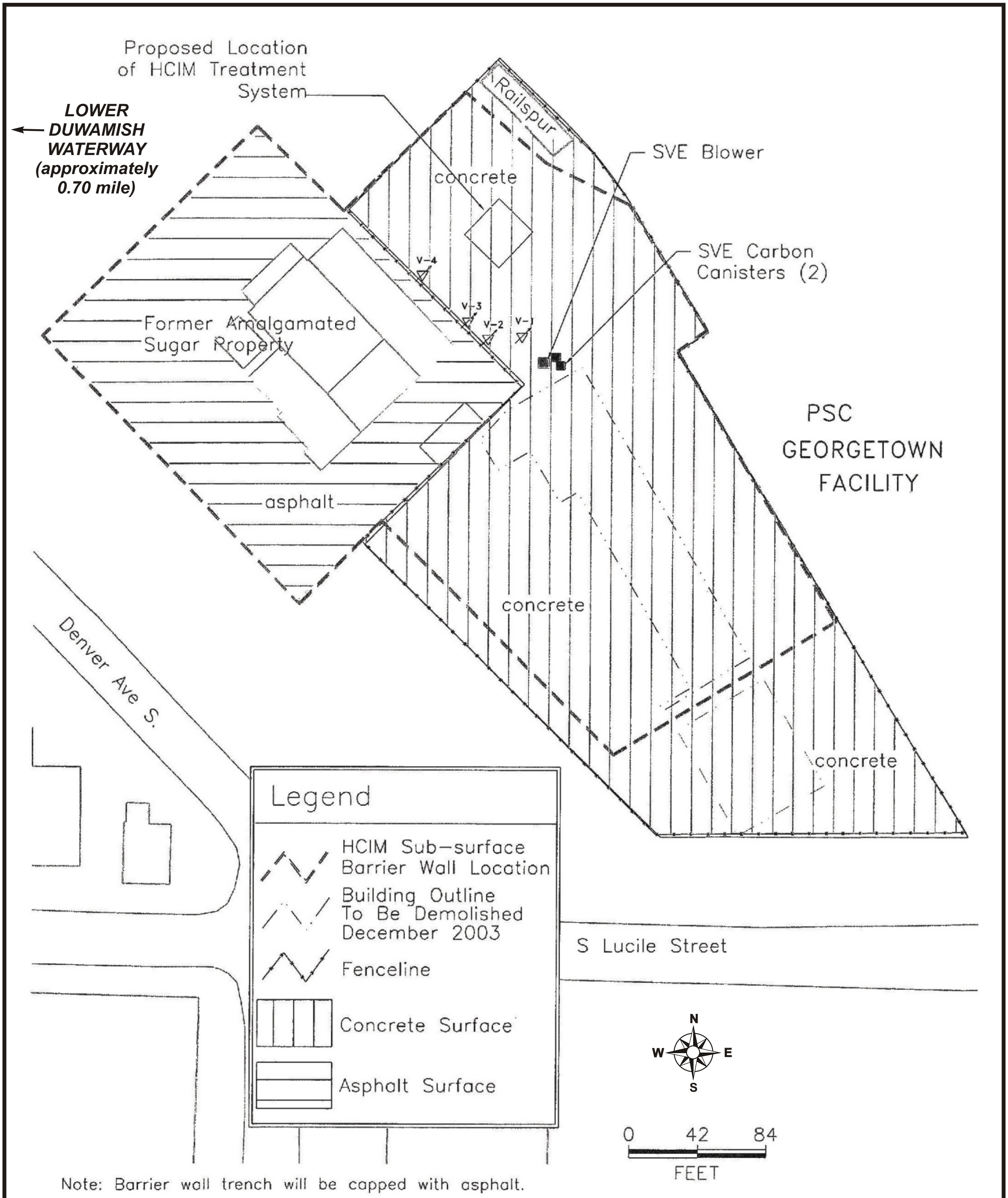
LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

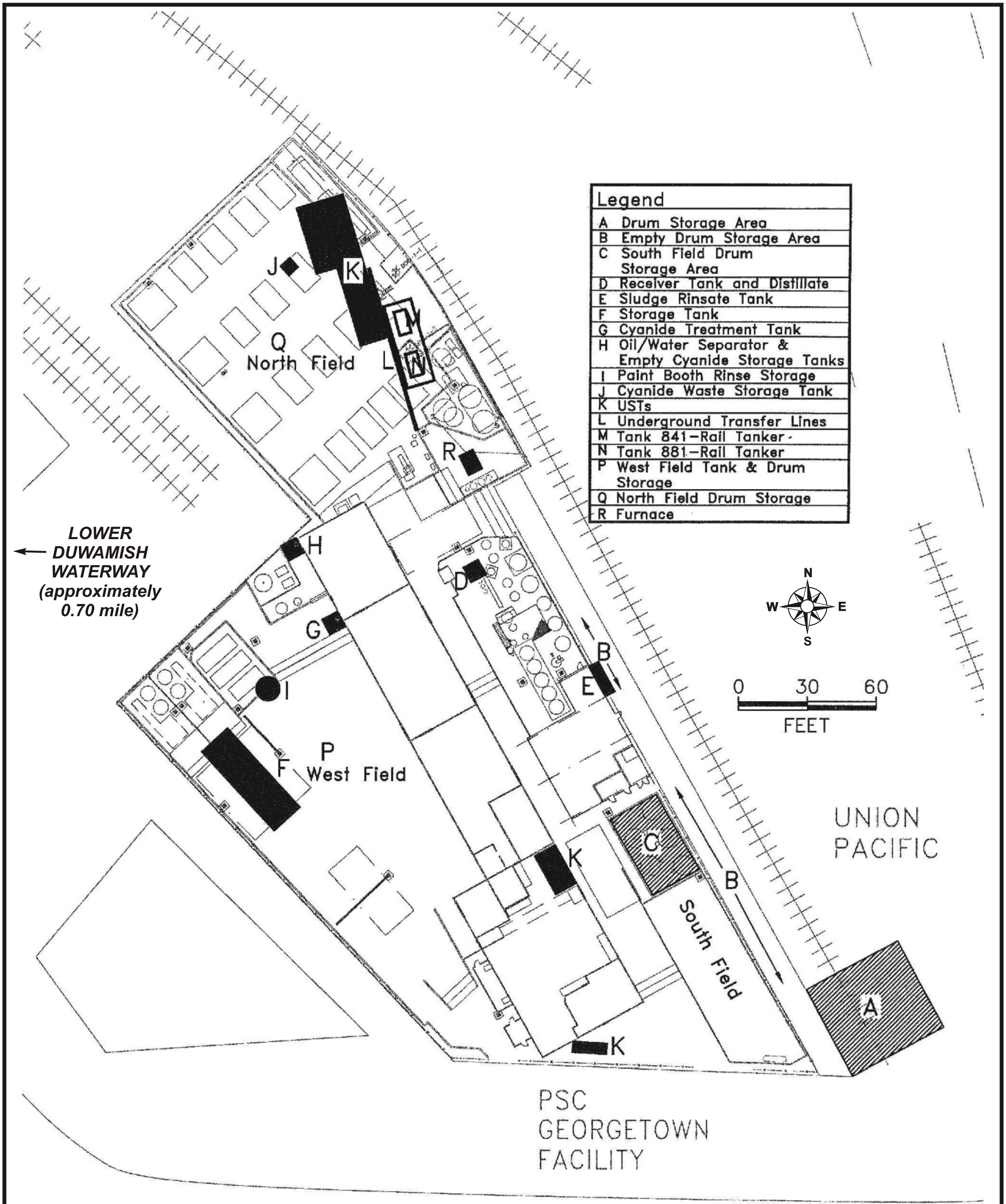
Figure 20
FORMER FACILITY LAYOUT FOR PSC

Base Map Reference: PSC 2003.

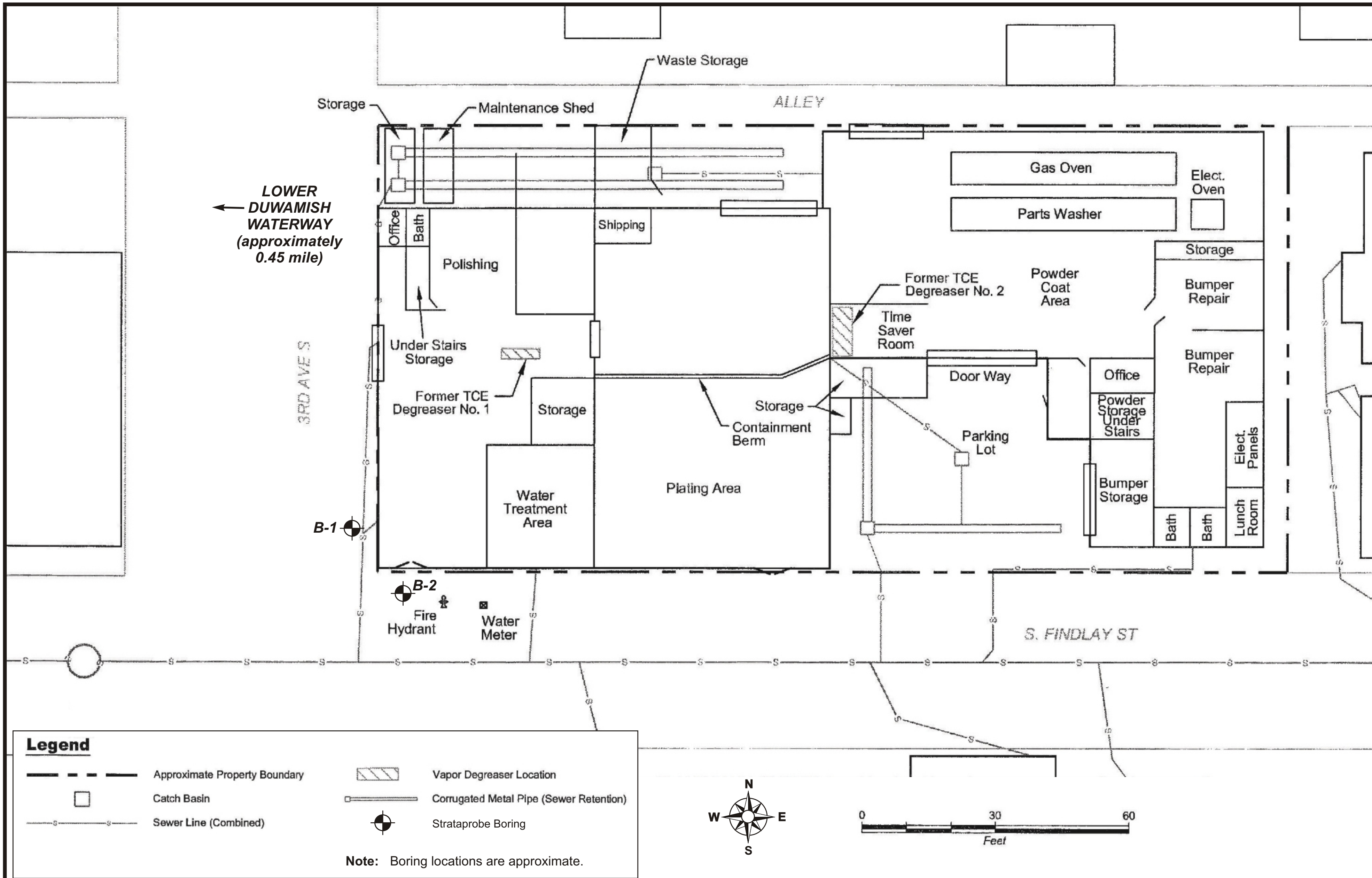
Date: 2-17-09 | Drawn by: AES | 10:002330WD1404\fig 20



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 21 PSC HCIM LAYOUT		
	Base Map Reference: PSC 2003.	Date: 2-17-09	Drawn by: AES	10:002330WD1404\fig 21



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 22 FORMER KNOWN CHEMICAL STORAGE AT PSC		
	Base Map Reference: PSC 2003.	Date: 2-17-09	Drawn by: AES	10:002330WD1404\fig 22



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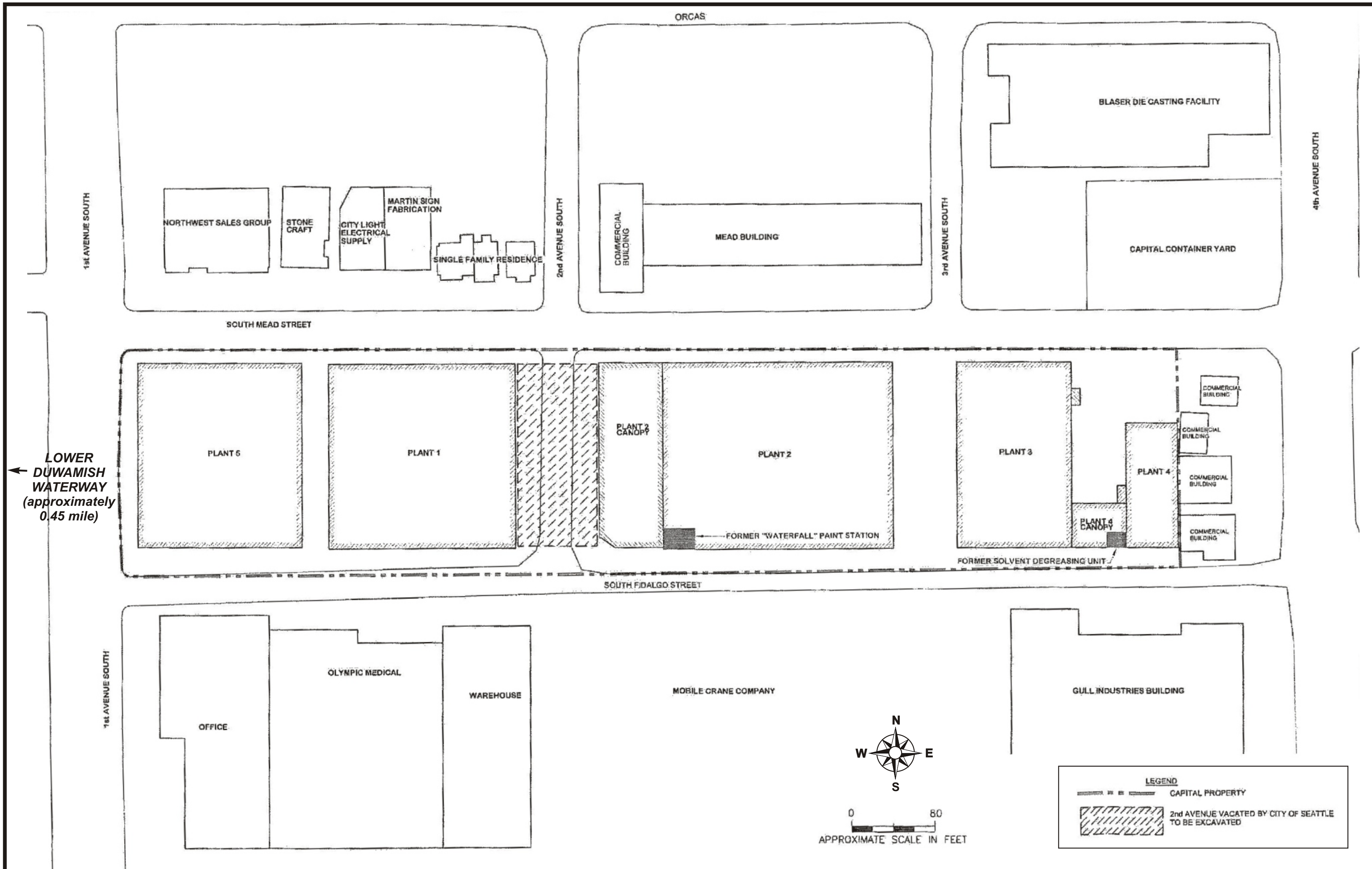
Seattle, Washington

LOWER DUWAMISH WATERWAY
RM 1.2-1.7 EAST
Tukwila, Washington

Base Map Reference: Aspect Consulting 2008.

Figure 23
ART BRASS FACILITY MAP

Date:	Drawn by:	
2/17/09	AES	10:002330WD1404\fig 23



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	LOWER DUWAMISH WATERWAY RM 1.2-1.7 EAST Tukwila, Washington	Figure 24 FACILITY LAYOUT FOR CAPITAL INDUSTRIES
	Base Map Reference: Farallon 2008.	Date: 2/17/09 · Drawn by: AES · 10:002330WD1404\fig 24

Appendix A

Sampling Data for Sediments in the Vicinity of the RM 1.2-1.7 East Source Control Area

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Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR092	1.6	EPA SI	8/27/1998	1,2,3,4,6,7,8-HpCDD	260	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,4,6,7,8-HpCDD	288	ng/kg dw		1.69						
DR092	1.6	EPA SI	8/27/1998	1,2,3,4,6,7,8-HpCDF	42	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,4,6,7,8-HpCDF	42.8	ng/kg dw		1.69						
DR092	1.6	EPA SI	8/27/1998	1,2,3,4,7,8,9-HpCDF	6.1	ng/kg dw	J	0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,4,7,8,9-HpCDF	3.12	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,4,7,8-HxCDD	2.24	ng/kg dw	J	1.69						
DR092	1.6	EPA SI	8/27/1998	1,2,3,4,7,8-HxCDF	15	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,4,7,8-HxCDF	5.12	ng/kg dw	J	1.69						
DR092	1.6	EPA SI	8/27/1998	1,2,3,6,7,8-HxCDD	8.2	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,6,7,8-HxCDD	11.7	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,6,7,8-HxCDF	1.98	ng/kg dw	J	1.69						
DR092	1.6	EPA SI	8/27/1998	1,2,3,7,8,9-HxCDD	4.8	ng/kg dw	J	0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,7,8,9-HxCDD	7.69	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,7,8,9-HxCDF	0.149	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,7,8-PeCDD	1.75	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	1,2,3,7,8-PeCDF	0.811	ng/kg dw	J	1.69						
B5b	1.5	LDWRI-Benthic	9/28/2004	1-Methylnaphthalene	7	ug/kg dw		1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	1-Methylnaphthalene	11	ug/kg dw		2.79						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	2,3,4,6,7,8-HxCDF	1.62	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	2,3,4,7,8-PeCDF	1.89	ng/kg dw	J	1.69						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	2,3,7,8-TCDD	0.463	ng/kg dw	J	1.69						
DR092	1.6	EPA SI	8/27/1998	2,3,7,8-TCDF	1.3	ng/kg dw	J	0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	2,3,7,8-TCDF	1.13	ng/kg dw		1.69						
B5b	1.5	LDWRI-Benthic	9/28/2004	2,4'-DDD	7	ug/kg dw	JN	1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	2,4'-DDT	5.1	ug/kg dw	JN	1.39						
DR091	1.5	EPA SI	8/31/1998	2-Methylnaphthalene	0.02	mg/kg dw		0.86	2.3	38	64	mg/kg OC	0.061	0.036
DR144	1.5	EPA SI	8/17/1998	2-Methylnaphthalene	0.03	mg/kg dw		1.84	1.6	38	64	mg/kg OC	0.042	0.025
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.005	mg/kg dw	J	1.48	0.34	38	64	mg/kg OC	0.0089	0.0053
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	1	ug/kg dw	J	0.34		670	1400	ug/kg dw	0.0015	0.00071
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.005	mg/kg dw	J	0.98	0.51	38	64	mg/kg OC	0.013	0.008
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.01	mg/kg dw	J	2.04	0.49	38	64	mg/kg OC	0.013	0.0077
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.003	mg/kg dw	J	1.18	0.25	38	64	mg/kg OC	0.0066	0.0039
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.009	mg/kg dw	J	2.9	0.31	38	64	mg/kg OC	0.0082	0.0048
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	7	ug/kg dw	J	0.47		670	1400	ug/kg dw	0.01	0.005
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	2-Methylnaphthalene	0.006	mg/kg dw	J	1.01	0.59	38	64	mg/kg OC	0.016	0.0092
B5b	1.5	LDWRI-Benthic	9/28/2004	2-Methylnaphthalene	0.0093	mg/kg dw		1.39	0.67	38	64	mg/kg OC	0.018	0.01
DR025	1.2	EPA SI	8/17/1998	2-Methylnaphthalene	0.02	mg/kg dw		2.83	0.71	38	64	mg/kg OC	0.019	0.011
B4b	1.4	LDWRI-Benthic	8/28/2004	2-Methylnaphthalene	0.014	mg/kg dw		2.79	0.5	38	64	mg/kg OC	0.013	0.0078
B5b	1.5	LDWRI-Benthic	9/28/2004	4,4'-DDD	0.86	ug/kg dw	JN	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	4,4'-DDD	1.1	ug/kg dw	JN	2.79						
B5b	1.5	LDWRI-Benthic	9/28/2004	4,4'-DDE	1.4	ug/kg dw	JN	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	4,4'-DDE	1.8	ug/kg dw	JN	2.79						
B5b	1.5	LDWRI-Benthic	9/28/2004	4,4'-DDT	6.5	ug/kg dw	JN	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	4,4'-DDT	3.4	ug/kg dw	JN	2.79						
DR025	1.2	EPA SI	8/17/1998	4-Methylphenol	100	ug/kg dw		2.83		670	670	ug/kg dw	0.15	0.15
B4b	1.4	LDWRI-Benthic	8/28/2004	4-Methylphenol	21	ug/kg dw		2.79		670	670	ug/kg dw	0.031	0.031
DR091	1.5	EPA SI	8/31/1998	Acenaphthene	0.12	mg/kg dw		0.86	14	16	57	mg/kg OC	0.88	0.25
DR092	1.6	EPA SI	8/27/1998	Acenaphthene	0.05	mg/kg dw		0.7	7.1	16	57	mg/kg OC	0.44	0.12
DR144	1.5	EPA SI	8/17/1998	Acenaphthene	0.11	mg/kg dw		1.84	6	16	57	mg/kg OC	0.38	0.11
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Acenaphthene	0.028	mg/kg dw		1.48	1.9	16	57	mg/kg OC	0.12	0.033
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Acenaphthene	10	ug/kg dw	J	0.34		500	730	ug/kg dw	0.02	0.014
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Acenaphthene	0.083	mg/kg dw		0.98	8.5	16	57	mg/kg OC	0.53	0.15
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Acenaphthene	0.003	mg/kg dw	J	2.04	0.15	16	57	mg/kg OC	0.0094	0.0026
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthene	0.035	mg/kg dw		1.18	3	16	57	mg/kg OC	0.19	0.053
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthene	0.003	mg/kg dw	J	0.71	0.42	16	57	mg/kg OC	0.026	0.0074

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthene	0.004	mg/kg dw	J	2.9	0.14	16	57	mg/kg OC	0.0088	0.0025
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Acenaphthene	36	ug/kg dw		0.47		500	730	ug/kg dw	0.072	0.049
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Acenaphthene	0.01	mg/kg dw	J	1.01	0.99	16	57	mg/kg OC	0.062	0.017
B5b	1.5	LDWRI-Benthic	9/28/2004	Acenaphthene	0.011	mg/kg dw		1.39	0.79	16	57	mg/kg OC	0.049	0.014
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Acenaphthene	0.025	mg/kg dw		1.75	1.4	16	57	mg/kg OC	0.088	0.025
DR025	1.2	EPA SI	8/17/1998	Acenaphthene	0.04	mg/kg dw		2.83	1.4	16	57	mg/kg OC	0.088	0.025
DR026	1.3	EPA SI	8/17/1998	Acenaphthene	0.03	mg/kg dw		3.24	0.93	16	57	mg/kg OC	0.058	0.016
DR027	1.3	EPA SI	8/17/1998	Acenaphthene	0.04	mg/kg dw		2.49	1.6	16	57	mg/kg OC	0.1	0.028
DR064	1.3	EPA SI	8/17/1998	Acenaphthene	0.03	mg/kg dw		2.58	1.2	16	57	mg/kg OC	0.075	0.021
B4b	1.4	LDWRI-Benthic	8/28/2004	Acenaphthene	0.013	mg/kg dw		2.79	0.47	16	57	mg/kg OC	0.029	0.0082
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.068	mg/kg dw		1.48	4.6	66	66	mg/kg OC	0.07	0.07
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.02	mg/kg dw	J	0.98	2	66	66	mg/kg OC	0.03	0.03
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.069	mg/kg dw		2.04	3.4	66	66	mg/kg OC	0.052	0.052
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.02	mg/kg dw	J	1.18	1.7	66	66	mg/kg OC	0.026	0.026
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.002	mg/kg dw	J	0.71	0.28	66	66	mg/kg OC	0.0042	0.0042
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.01	mg/kg dw	J	2.9	0.34	66	66	mg/kg OC	0.0052	0.0052
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Acenaphthylene	10	ug/kg dw	J	0.47		1300	1300	ug/kg dw	0.0077	0.0077
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Acenaphthylene	0.077	mg/kg dw		1.01	7.6	66	66	mg/kg OC	0.12	0.12
B5b	1.5	LDWRI-Benthic	9/28/2004	Acenaphthylene	0.031	mg/kg dw		1.39	2.2	66	66	mg/kg OC	0.033	0.033
B4b	1.4	LDWRI-Benthic	8/28/2004	Acenaphthylene	0.028	mg/kg dw		2.79	1	66	66	mg/kg OC	0.015	0.015
DR091	1.5	EPA SI	8/31/1998	Aluminum	10100	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Aluminum	9410	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Aluminum	18100	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Aluminum	20200	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Aluminum	21700	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Aluminum	18600	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Aluminum	20100	mg/kg dw		2.58						
DR091	1.5	EPA SI	8/31/1998	Anthracene	0.13	mg/kg dw		0.86	15	220	1200	mg/kg OC	0.068	0.013
DR092	1.6	EPA SI	8/27/1998	Anthracene	0.05	mg/kg dw		0.7	7.1	220	1200	mg/kg OC	0.032	0.0059
DR144	1.5	EPA SI	8/17/1998	Anthracene	0.09	mg/kg dw		1.84	4.9	220	1200	mg/kg OC	0.022	0.0041
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Anthracene	0.28	mg/kg dw		1.48	19	220	1200	mg/kg OC	0.086	0.016
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Anthracene	9	ug/kg dw	J	0.34		960	4400	ug/kg dw	0.0094	0.002
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Anthracene	0.14	mg/kg dw		0.98	14	220	1200	mg/kg OC	0.064	0.012
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Anthracene	0.2	mg/kg dw		2.04	9.8	220	1200	mg/kg OC	0.045	0.0082
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Anthracene	0.047	mg/kg dw		1.18	4	220	1200	mg/kg OC	0.018	0.0033
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Anthracene	0.006	mg/kg dw	J	0.71	0.85	220	1200	mg/kg OC	0.0039	0.00071
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Anthracene	0.027	mg/kg dw		2.9	0.93	220	1200	mg/kg OC	0.0042	0.00078
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Anthracene	59	ug/kg dw		0.47		960	4400	ug/kg dw	0.061	0.013
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Anthracene	0.27	mg/kg dw		1.01	27	220	1200	mg/kg OC	0.12	0.023
B5b	1.5	LDWRI-Benthic	9/28/2004	Anthracene	0.1	mg/kg dw		1.39	7.2	220	1200	mg/kg OC	0.033	0.006
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Anthracene	0.036	mg/kg dw		2.4	1.5	220	1200	mg/kg OC	0.0068	0.0013
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Anthracene	0.12	mg/kg dw		2.02	5.9	220	1200	mg/kg OC	0.027	0.0049
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Anthracene	0.12	mg/kg dw		1.69	7.1	220	1200	mg/kg OC	0.032	0.0059
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Anthracene	0.045	mg/kg dw		2.44	1.8	220	1200	mg/kg OC	0.0082	0.0015
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Anthracene	0.09	mg/kg dw		1.75	5.1	220	1200	mg/kg OC	0.023	0.0043
DR025	1.2	EPA SI	8/17/1998	Anthracene	0.2	mg/kg dw		2.83	7.1	220	1200	mg/kg OC	0.032	0.0059
DR026	1.3	EPA SI	8/17/1998	Anthracene	0.11	mg/kg dw		3.24	3.4	220	1200	mg/kg OC	0.015	0.0028
DR027	1.3	EPA SI	8/17/1998	Anthracene	0.14	mg/kg dw		2.49	5.6	220	1200	mg/kg OC	0.025	0.0047
DR064	1.3	EPA SI	8/17/1998	Anthracene	0.12	mg/kg dw		2.58	4.7	220	1200	mg/kg OC	0.021	0.0039
B4b	1.4	LDWRI-Benthic	8/28/2004	Anthracene	0.082	mg/kg dw		2.79	2.9	220	1200	mg/kg OC	0.013	0.0024
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Anthracene	0.099	mg/kg dw		2.04	4.9	220	1200	mg/kg OC	0.022	0.0041
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Anthracene	0.1	mg/kg dw		2.11	4.7	220	1200	mg/kg OC	0.021	0.0039
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Anthracene	0.089	mg/kg dw		2.33	3.8	220	1200	mg/kg OC	0.017	0.0032
DR144	1.5	EPA SI	8/17/1998	Antimony	7	mg/kg dw	J	1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Antimony	0.59	mg/kg dw	J	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Antimony	1.04	mg/kg dw	J	2.79						

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR091	1.5	EPA SI	8/31/1998	Arsenic	7.3	mg/kg dw		0.86		57	93	mg/kg dw	0.13	0.078
DR092	1.6	EPA SI	8/27/1998	Arsenic	6	mg/kg dw		0.7		57	93	mg/kg dw	0.11	0.065
DR144	1.5	EPA SI	8/17/1998	Arsenic	25.6	mg/kg dw		1.84		57	93	mg/kg dw	0.45	0.28
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Arsenic	2.8	mg/kg dw		1.48		57	93	mg/kg dw	0.049	0.03
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Arsenic	1.4	mg/kg dw		0.34		57	93	mg/kg dw	0.025	0.015
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Arsenic	1.2	mg/kg dw		0.98		57	93	mg/kg dw	0.021	0.013
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Arsenic	5.6	mg/kg dw		2.04		57	93	mg/kg dw	0.098	0.06
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Arsenic	4.2	mg/kg dw		1.18		57	93	mg/kg dw	0.074	0.045
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Arsenic	2	mg/kg dw		0.71		57	93	mg/kg dw	0.035	0.022
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Arsenic	6	mg/kg dw		2.9		57	93	mg/kg dw	0.11	0.065
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Arsenic	7.5	mg/kg dw	J	0.47		57	93	mg/kg dw	0.13	0.081
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Arsenic	27.3	mg/kg dw		1.01		57	93	mg/kg dw	0.48	0.29
B5b	1.5	LDWRI-Benthic	9/28/2004	Arsenic	6.74	mg/kg dw	J	1.39		57	93	mg/kg dw	0.12	0.072
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Arsenic	15.5	mg/kg dw		2.4		57	93	mg/kg dw	0.27	0.17
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Arsenic	8.8	mg/kg dw		2.02		57	93	mg/kg dw	0.15	0.095
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Arsenic	4.1	mg/kg dw		1.08		57	93	mg/kg dw	0.072	0.044
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Arsenic	21.2	mg/kg dw		1.69		57	93	mg/kg dw	0.37	0.23
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Arsenic	6.1	mg/kg dw		1.68		57	93	mg/kg dw	0.11	0.066
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Arsenic	11.3	mg/kg dw		2.44		57	93	mg/kg dw	0.2	0.12
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Arsenic	5.6	mg/kg dw		1.75		57	93	mg/kg dw	0.098	0.06
DR025	1.2	EPA SI	8/17/1998	Arsenic	12.9	mg/kg dw		2.83		57	93	mg/kg dw	0.23	0.14
DR026	1.3	EPA SI	8/17/1998	Arsenic	13	mg/kg dw		3.24		57	93	mg/kg dw	0.23	0.14
DR027	1.3	EPA SI	8/17/1998	Arsenic	13.4	mg/kg dw		2.49		57	93	mg/kg dw	0.24	0.14
DR064	1.3	EPA SI	8/17/1998	Arsenic	13.5	mg/kg dw		2.58		57	93	mg/kg dw	0.24	0.15
B4b	1.4	LDWRI-Benthic	8/28/2004	Arsenic	10.3	mg/kg dw	J	2.79		57	93	mg/kg dw	0.18	0.11
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Arsenic	17.1	mg/kg dw		2.04		57	93	mg/kg dw	0.3	0.18
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Arsenic	13	mg/kg dw		2.11		57	93	mg/kg dw	0.23	0.14
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Arsenic	14.7	mg/kg dw		2.33		57	93	mg/kg dw	0.26	0.16
DR091	1.5	EPA SI	8/31/1998	Barium	45	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Barium	41	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Barium	124	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Barium	82	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Barium	89	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Barium	7380	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Barium	83	mg/kg dw		2.58						
DR091	1.5	EPA SI	8/31/1998	Benzo(a)anthracene	0.3	mg/kg dw		0.86	35	110	270	mg/kg OC	0.32	0.13
DR092	1.6	EPA SI	8/27/1998	Benzo(a)anthracene	0.13	mg/kg dw		0.7	19	110	270	mg/kg OC	0.17	0.07
DR144	1.5	EPA SI	8/17/1998	Benzo(a)anthracene	0.31	mg/kg dw		1.84	17	110	270	mg/kg OC	0.15	0.063
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.77	mg/kg dw		1.48	52	110	270	mg/kg OC	0.47	0.19
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	20	ug/kg dw	J	0.34		1300	1600	ug/kg dw	0.015	0.013
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.11	mg/kg dw		0.98	11	110	270	mg/kg OC	0.1	0.041
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.1	mg/kg dw	J	2.04	4.9	110	270	mg/kg OC	0.045	0.018
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.084	mg/kg dw		1.18	7.1	110	270	mg/kg OC	0.065	0.026
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.02	mg/kg dw	J	0.71	2.8	110	270	mg/kg OC	0.025	0.01
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.049	mg/kg dw		2.9	1.7	110	270	mg/kg OC	0.015	0.0063
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	87	ug/kg dw		0.47		1300	1600	ug/kg dw	0.067	0.054
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(a)anthracene	0.52	mg/kg dw		1.01	51	110	270	mg/kg OC	0.46	0.19
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(a)anthracene	0.32	mg/kg dw		1.39	23	110	270	mg/kg OC	0.21	0.085
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzo(a)anthracene	0.12	mg/kg dw		2.4	5	110	270	mg/kg OC	0.045	0.019
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)anthracene	0.25	mg/kg dw		2.02	12	110	270	mg/kg OC	0.11	0.044
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Benzo(a)anthracene	0.046	mg/kg dw		1.08	4.3	110	270	mg/kg OC	0.039	0.016
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)anthracene	0.32	mg/kg dw		1.69	19	110	270	mg/kg OC	0.17	0.07
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzo(a)anthracene	0.04	mg/kg dw		1.68	2.4	110	270	mg/kg OC	0.022	0.0089
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzo(a)anthracene	0.12	mg/kg dw		2.44	4.9	110	270	mg/kg OC	0.045	0.018
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzo(a)anthracene	0.26	mg/kg dw		1.75	15	110	270	mg/kg OC	0.14	0.056
DR025	1.2	EPA SI	8/17/1998	Benzo(a)anthracene	0.47	mg/kg dw		2.83	17	110	270	mg/kg OC	0.15	0.063

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR026	1.3	EPA SI	8/17/1998	Benzo(a)anthracene	0.37	mg/kg dw		3.24	11	110	270	mg/kg OC	0.1	0.041
DR027	1.3	EPA SI	8/17/1998	Benzo(a)anthracene	0.35	mg/kg dw		2.49	14	110	270	mg/kg OC	0.13	0.052
DR064	1.3	EPA SI	8/17/1998	Benzo(a)anthracene	0.32	mg/kg dw		2.58	12	110	270	mg/kg OC	0.11	0.044
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(a)anthracene	0.21	mg/kg dw		2.79	7.5	110	270	mg/kg OC	0.068	0.028
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)anthracene	0.22	mg/kg dw		2.04	11	110	270	mg/kg OC	0.1	0.041
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(a)anthracene	0.32	mg/kg dw		2.11	15	110	270	mg/kg OC	0.14	0.056
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(a)anthracene	0.24	mg/kg dw		2.33	10	110	270	mg/kg OC	0.091	0.037
DR091	1.5	EPA SI	8/31/1998	Benzo(a)pyrene	0.19	mg/kg dw		0.86	22	99	210	mg/kg OC	0.22	0.1
DR092	1.6	EPA SI	8/27/1998	Benzo(a)pyrene	0.11	mg/kg dw		0.7	16	99	210	mg/kg OC	0.16	0.076
DR144	1.5	EPA SI	8/17/1998	Benzo(a)pyrene	0.3	mg/kg dw		1.84	16	99	210	mg/kg OC	0.16	0.076
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.17	mg/kg dw		1.48	11	99	210	mg/kg OC	0.11	0.052
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	10	ug/kg dw	J	0.34		1600	3000	ug/kg dw	0.0063	0.0033
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.1	mg/kg dw		0.98	10	99	210	mg/kg OC	0.1	0.048
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.1	mg/kg dw	J	2.04	4.9	99	210	mg/kg OC	0.049	0.023
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.078	mg/kg dw		1.18	6.6	99	210	mg/kg OC	0.067	0.031
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.01	mg/kg dw	J	0.71	1.4	99	210	mg/kg OC	0.014	0.0067
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.05	mg/kg dw		2.9	1.7	99	210	mg/kg OC	0.017	0.0081
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	67	ug/kg dw		0.47		1600	3000	ug/kg dw	0.042	0.022
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(a)pyrene	0.31	mg/kg dw		1.01	31	99	210	mg/kg OC	0.31	0.15
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(a)pyrene	0.22	mg/kg dw		1.39	16	99	210	mg/kg OC	0.16	0.076
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzo(a)pyrene	0.11	mg/kg dw		2.4	4.6	99	210	mg/kg OC	0.046	0.022
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)pyrene	0.27	mg/kg dw		2.02	13	99	210	mg/kg OC	0.13	0.062
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Benzo(a)pyrene	0.026	mg/kg dw		1.08	2.4	99	210	mg/kg OC	0.024	0.011
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)pyrene	0.28	mg/kg dw		1.69	17	99	210	mg/kg OC	0.17	0.081
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzo(a)pyrene	0.06	mg/kg dw		1.68	3.6	99	210	mg/kg OC	0.036	0.017
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzo(a)pyrene	0.11	mg/kg dw		2.44	4.5	99	210	mg/kg OC	0.045	0.021
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzo(a)pyrene	0.22	mg/kg dw		1.75	13	99	210	mg/kg OC	0.13	0.062
DR025	1.2	EPA SI	8/17/1998	Benzo(a)pyrene	0.36	mg/kg dw		2.83	13	99	210	mg/kg OC	0.13	0.062
DR026	1.3	EPA SI	8/17/1998	Benzo(a)pyrene	0.32	mg/kg dw		3.24	9.9	99	210	mg/kg OC	0.1	0.047
DR027	1.3	EPA SI	8/17/1998	Benzo(a)pyrene	0.32	mg/kg dw		2.49	13	99	210	mg/kg OC	0.13	0.062
DR064	1.3	EPA SI	8/17/1998	Benzo(a)pyrene	0.3	mg/kg dw		2.58	12	99	210	mg/kg OC	0.12	0.057
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(a)pyrene	0.2	mg/kg dw		2.79	7.2	99	210	mg/kg OC	0.073	0.034
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(a)pyrene	0.23	mg/kg dw		2.04	11	99	210	mg/kg OC	0.11	0.052
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(a)pyrene	0.33	mg/kg dw		2.11	16	99	210	mg/kg OC	0.16	0.076
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(a)pyrene	0.27	mg/kg dw		2.33	12	99	210	mg/kg OC	0.12	0.057
DR091	1.5	EPA SI	8/31/1998	Benzo(b)fluoranthene	260	ug/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Benzo(b)fluoranthene	130	ug/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Benzo(b)fluoranthene	320	ug/kg dw		1.84						
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	580	ug/kg dw		1.48						
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	20	ug/kg dw	J	0.34						
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	120	ug/kg dw		0.98						
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	100	ug/kg dw	J	2.04						
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	100	ug/kg dw		1.18						
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	20	ug/kg dw	J	0.71						
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	42	ug/kg dw		2.9						
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	94	ug/kg dw		0.47						
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(b)fluoranthene	520	ug/kg dw		1.01						
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(b)fluoranthene	340	ug/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzo(b)fluoranthene	140	ug/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(b)fluoranthene	400	ug/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Benzo(b)fluoranthene	38	ug/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(b)fluoranthene	380	ug/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzo(b)fluoranthene	74	ug/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzo(b)fluoranthene	160	ug/kg dw		2.44						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzo(b)fluoranthene	460	ug/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Benzo(b)fluoranthene	480	ug/kg dw		2.83						

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR026	1.3	EPA SI	8/17/1998	Benzo(b)fluoranthene	370	ug/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Benzo(b)fluoranthene	360	ug/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Benzo(b)fluoranthene	390	ug/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(b)fluoranthene	310	ug/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(b)fluoranthene	330	ug/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(b)fluoranthene	580	ug/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(b)fluoranthene	440	ug/kg dw		2.33						
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(e)pyrene	230	ug/kg dw		1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(e)pyrene	220	ug/kg dw		2.79						
DR091	1.5	EPA SI	8/31/1998	Benzo(g,h,i)perylene	0.11	mg/kg dw		0.86	13	31	78	mg/kg OC	0.42	0.17
DR092	1.6	EPA SI	8/27/1998	Benzo(g,h,i)perylene	0.06	mg/kg dw		0.7	8.6	31	78	mg/kg OC	0.28	0.11
DR144	1.5	EPA SI	8/17/1998	Benzo(g,h,i)perylene	0.17	mg/kg dw		1.84	9.2	31	78	mg/kg OC	0.3	0.12
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.091	mg/kg dw		1.48	6.1	31	78	mg/kg OC	0.2	0.078
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	8	ug/kg dw	J	0.34		670	720	ug/kg dw	0.012	0.011
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.062	mg/kg dw		0.98	6.3	31	78	mg/kg OC	0.2	0.081
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.2	mg/kg dw	J	2.04	9.8	31	78	mg/kg OC	0.32	0.13
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.051	mg/kg dw		1.18	4.3	31	78	mg/kg OC	0.14	0.055
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.01	mg/kg dw	J	0.71	1.4	31	78	mg/kg OC	0.045	0.018
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.038	mg/kg dw		2.9	1.3	31	78	mg/kg OC	0.042	0.017
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	40	ug/kg dw		0.47		670	720	ug/kg dw	0.06	0.056
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(g,h,i)perylene	0.14	mg/kg dw		1.01	14	31	78	mg/kg OC	0.45	0.18
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(g,h,i)perylene	0.12	mg/kg dw		1.39	8.6	31	78	mg/kg OC	0.28	0.11
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzo(g,h,i)perylene	0.028	mg/kg dw		2.4	1.2	31	78	mg/kg OC	0.039	0.015
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(g,h,i)perylene	0.055	mg/kg dw	J	2.02	2.7	31	78	mg/kg OC	0.087	0.035
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(g,h,i)perylene	0.14	mg/kg dw		1.69	8.3	31	78	mg/kg OC	0.27	0.11
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzo(g,h,i)perylene	0.037	mg/kg dw		1.68	2.2	31	78	mg/kg OC	0.071	0.028
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzo(g,h,i)perylene	0.05	mg/kg dw		2.44	2	31	78	mg/kg OC	0.065	0.026
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzo(g,h,i)perylene	0.054	mg/kg dw		1.75	3.1	31	78	mg/kg OC	0.1	0.04
DR025	1.2	EPA SI	8/17/1998	Benzo(g,h,i)perylene	0.22	mg/kg dw		2.83	7.8	31	78	mg/kg OC	0.25	0.1
DR026	1.3	EPA SI	8/17/1998	Benzo(g,h,i)perylene	0.19	mg/kg dw		3.24	5.9	31	78	mg/kg OC	0.19	0.076
DR027	1.3	EPA SI	8/17/1998	Benzo(g,h,i)perylene	0.19	mg/kg dw		2.49	7.6	31	78	mg/kg OC	0.25	0.097
DR064	1.3	EPA SI	8/17/1998	Benzo(g,h,i)perylene	0.2	mg/kg dw		2.58	7.8	31	78	mg/kg OC	0.25	0.1
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(g,h,i)perylene	0.14	mg/kg dw		2.79	5	31	78	mg/kg OC	0.16	0.064
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(g,h,i)perylene	0.058	mg/kg dw	J	2.04	2.8	31	78	mg/kg OC	0.09	0.036
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(g,h,i)perylene	0.13	mg/kg dw		2.11	6.2	31	78	mg/kg OC	0.2	0.079
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(g,h,i)perylene	0.097	mg/kg dw		2.33	4.2	31	78	mg/kg OC	0.14	0.054
DR091	1.5	EPA SI	8/31/1998	Benzo(k)fluoranthene	210	ug/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Benzo(k)fluoranthene	130	ug/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Benzo(k)fluoranthene	290	ug/kg dw		1.84						
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	450	ug/kg dw		1.48						
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	10	ug/kg dw	J	0.34						
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	84	ug/kg dw		0.98						
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	90	ug/kg dw	J	2.04						
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	74	ug/kg dw		1.18						
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	20	ug/kg dw	J	0.71						
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	37	ug/kg dw		2.9						
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	72	ug/kg dw		0.47						
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzo(k)fluoranthene	420	ug/kg dw		1.01						
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzo(k)fluoranthene	230	ug/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzo(k)fluoranthene	100	ug/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(k)fluoranthene	410	ug/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Benzo(k)fluoranthene	24	ug/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(k)fluoranthene	380	ug/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzo(k)fluoranthene	66	ug/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzo(k)fluoranthene	110	ug/kg dw		2.44						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzo(k)fluoranthene	230	ug/kg dw		1.75						

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Contaminants Detected in Surface Sediment
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Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR025	1.2	EPA SI	8/17/1998	Benzo(k)fluoranthene	340	ug/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Benzo(k)fluoranthene	300	ug/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Benzo(k)fluoranthene	320	ug/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Benzo(k)fluoranthene	260	ug/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzo(k)fluoranthene	200	ug/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzo(k)fluoranthene	380	ug/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(k)fluoranthene	370	ug/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzo(k)fluoranthene	260	ug/kg dw		2.33						
DR091	1.5	EPA SI	8/31/1998	Benzofluoranthenes (total-calc'd)	0.47	mg/kg dw		0.86	55	230	450	mg/kg OC	0.24	0.12
DR092	1.6	EPA SI	8/27/1998	Benzofluoranthenes (total-calc'd)	0.26	mg/kg dw		0.7	37	230	450	mg/kg OC	0.16	0.082
DR144	1.5	EPA SI	8/17/1998	Benzofluoranthenes (total-calc'd)	0.61	mg/kg dw		1.84	33	230	450	mg/kg OC	0.14	0.073
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	1.03	mg/kg dw		1.48	69.6	230	450	mg/kg OC	0.3	0.15
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	30	ug/kg dw	J	0.34		3200	3600	ug/kg dw	0.0094	0.0083
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.2	mg/kg dw		0.98	20	230	450	mg/kg OC	0.087	0.044
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.19	mg/kg dw	J	2.04	9.3	230	450	mg/kg OC	0.04	0.021
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.17	mg/kg dw		1.18	14	230	450	mg/kg OC	0.061	0.031
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.04	mg/kg dw	J	0.71	5.6	230	450	mg/kg OC	0.024	0.012
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.079	mg/kg dw		2.9	2.7	230	450	mg/kg OC	0.012	0.006
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	166	ug/kg dw		0.47		3200	3600	ug/kg dw	0.052	0.046
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Benzofluoranthenes (total-calc'd)	0.94	mg/kg dw		1.01	93	230	450	mg/kg OC	0.4	0.21
B5b	1.5	LDWRI-Benthic	9/28/2004	Benzofluoranthenes (total-calc'd)	0.57	mg/kg dw		1.39	41	230	450	mg/kg OC	0.18	0.091
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Benzofluoranthenes (total-calc'd)	0.24	mg/kg dw		2.4	10	230	450	mg/kg OC	0.043	0.022
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzofluoranthenes (total-calc'd)	0.81	mg/kg dw		2.02	40	230	450	mg/kg OC	0.17	0.089
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Benzofluoranthenes (total-calc'd)	0.062	mg/kg dw		1.08	5.7	230	450	mg/kg OC	0.025	0.013
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzofluoranthenes (total-calc'd)	0.76	mg/kg dw		1.69	45	230	450	mg/kg OC	0.2	0.1
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Benzofluoranthenes (total-calc'd)	0.14	mg/kg dw		1.68	8.33	230	450	mg/kg OC	0.036	0.019
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Benzofluoranthenes (total-calc'd)	0.27	mg/kg dw		2.44	11	230	450	mg/kg OC	0.048	0.024
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Benzofluoranthenes (total-calc'd)	0.69	mg/kg dw		1.75	39	230	450	mg/kg OC	0.17	0.087
DR025	1.2	EPA SI	8/17/1998	Benzofluoranthenes (total-calc'd)	0.82	mg/kg dw		2.83	29	230	450	mg/kg OC	0.13	0.064
DR026	1.3	EPA SI	8/17/1998	Benzofluoranthenes (total-calc'd)	0.67	mg/kg dw		3.24	21	230	450	mg/kg OC	0.091	0.047
DR027	1.3	EPA SI	8/17/1998	Benzofluoranthenes (total-calc'd)	0.68	mg/kg dw		2.49	27	230	450	mg/kg OC	0.12	0.06
DR064	1.3	EPA SI	8/17/1998	Benzofluoranthenes (total-calc'd)	0.65	mg/kg dw		2.58	25	230	450	mg/kg OC	0.11	0.056
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzofluoranthenes (total-calc'd)	0.51	mg/kg dw		2.79	18	230	450	mg/kg OC	0.078	0.04
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Benzofluoranthenes (total-calc'd)	0.71	mg/kg dw		2.04	35	230	450	mg/kg OC	0.15	0.078
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzofluoranthenes (total-calc'd)	0.95	mg/kg dw		2.11	45	230	450	mg/kg OC	0.2	0.1
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Benzofluoranthenes (total-calc'd)	0.7	mg/kg dw		2.33	30	230	450	mg/kg OC	0.13	0.067
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzoic acid	250	ug/kg dw		2.79		650	650	ug/kg dw	0.38	0.38
B4b	1.4	LDWRI-Benthic	8/28/2004	Benzyl alcohol	70	ug/kg dw	J	2.79		57	73	ug/kg dw	1.2	0.96
DR091	1.5	EPA SI	8/31/1998	Beryllium	0.19	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Beryllium	0.2	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Beryllium	0.47	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Beryllium	0.46	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Beryllium	0.48	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Beryllium	0.45	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Beryllium	0.52	mg/kg dw		2.58						
B5b	1.5	LDWRI-Benthic	9/28/2004	Biphenyl	4.3	ug/kg dw	J	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Biphenyl	4.8	ug/kg dw	J	2.79						
DR091	1.5	EPA SI	8/31/1998	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw		0.86	13	47	78	mg/kg OC	0.28	0.17
DR092	1.6	EPA SI	8/27/1998	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw		0.7	16	47	78	mg/kg OC	0.34	0.21
DR144	1.5	EPA SI	8/17/1998	Bis(2-ethylhexyl)phthalate	0.61	mg/kg dw		1.84	33	47	78	mg/kg OC	0.7	0.42
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.14	mg/kg dw	J	1.48	9.5	47	78	mg/kg OC	0.2	0.12
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	10	ug/kg dw	J	0.34		1300	1900	ug/kg dw	0.0077	0.0053
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.023	mg/kg dw	J	0.98	2.3	47	78	mg/kg OC	0.049	0.029
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.36	mg/kg dw	J	2.04	18	47	78	mg/kg OC	0.38	0.23
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.07	mg/kg dw	J	1.18	5.9	47	78	mg/kg OC	0.13	0.076
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.022	mg/kg dw	J	0.71	3.1	47	78	mg/kg OC	0.066	0.04

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.07	mg/kg dw	J	2.9	2.4	47	78	mg/kg OC	0.051	0.031
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	39	ug/kg dw	J	0.47		1300	1900	ug/kg dw	0.03	0.021
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw	J	1.01	11	47	78	mg/kg OC	0.23	0.14
B5b	1.5	LDWRI-Benthic	9/28/2004	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw	J	1.39	7.9	47	78	mg/kg OC	0.17	0.1
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Bis(2-ethylhexyl)phthalate	0.095	mg/kg dw		2.4	4	47	78	mg/kg OC	0.085	0.051
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Bis(2-ethylhexyl)phthalate	0.2	mg/kg dw		2.02	9.9	47	78	mg/kg OC	0.21	0.13
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Bis(2-ethylhexyl)phthalate	0.02	mg/kg dw		1.08	1.9	47	78	mg/kg OC	0.04	0.024
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Bis(2-ethylhexyl)phthalate	0.24	mg/kg dw		1.69	14	47	78	mg/kg OC	0.3	0.18
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Bis(2-ethylhexyl)phthalate	0.074	mg/kg dw		1.68	4.4	47	78	mg/kg OC	0.094	0.056
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Bis(2-ethylhexyl)phthalate	0.1	mg/kg dw		1.75	5.7	47	78	mg/kg OC	0.12	0.073
DR025	1.2	EPA SI	8/17/1998	Bis(2-ethylhexyl)phthalate	0.49	mg/kg dw		2.83	17	47	78	mg/kg OC	0.36	0.22
DR026	1.3	EPA SI	8/17/1998	Bis(2-ethylhexyl)phthalate	0.46	mg/kg dw		3.24	14	47	78	mg/kg OC	0.3	0.18
DR027	1.3	EPA SI	8/17/1998	Bis(2-ethylhexyl)phthalate	0.53	mg/kg dw		2.49	21	47	78	mg/kg OC	0.45	0.27
DR064	1.3	EPA SI	8/17/1998	Bis(2-ethylhexyl)phthalate	0.47	mg/kg dw		2.58	18	47	78	mg/kg OC	0.38	0.23
B4b	1.4	LDWRI-Benthic	8/28/2004	Bis(2-ethylhexyl)phthalate	0.14	mg/kg dw	J	2.79	5	47	78	mg/kg OC	0.11	0.064
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Bis(2-ethylhexyl)phthalate	0.38	mg/kg dw		2.04	19	47	78	mg/kg OC	0.4	0.24
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Bis(2-ethylhexyl)phthalate	0.36	mg/kg dw		2.11	17	47	78	mg/kg OC	0.36	0.22
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Bis(2-ethylhexyl)phthalate	0.46	mg/kg dw		2.33	20	47	78	mg/kg OC	0.43	0.26
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Butyl benzyl phthalate	0.03	mg/kg dw		1.48	2	4.9	64	mg/kg OC	0.41	0.031
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Butyl benzyl phthalate	0.007	mg/kg dw	J	1.01	0.69	4.9	64	mg/kg OC	0.14	0.011
B5b	1.5	LDWRI-Benthic	9/28/2004	Butyl benzyl phthalate	0.0085	mg/kg dw	J	1.39	0.61	4.9	64	mg/kg OC	0.12	0.0095
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Butyl benzyl phthalate	0.03	mg/kg dw		2.11	1.4	4.9	64	mg/kg OC	0.29	0.022
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Butyl benzyl phthalate	0.033	mg/kg dw		2.33	1.4	4.9	64	mg/kg OC	0.29	0.022
B5b	1.5	LDWRI-Benthic	9/28/2004	C1-Chrysenes	200	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C1-Fluoranthene/Pyrene	470	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C1-Fluorenes	5.8	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C1-Phenanthrenes/Anthracenes	94	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C2-Chrysenes	100	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C2-Dibenzothiophenes	20	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C2-Fluorenes	17	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C2-Naphthalenes	21	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C2-Phenanthrenes/Anthracenes	71	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C3-Chrysenes	70	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C3-Dibenzothiophenes	27	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C3-Fluorenes	30	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C3-Naphthalenes	25	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C3-Phenanthrenes/Anthracenes	60	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C4-Chrysenes	31	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C4-Naphthalenes	18	ug/kg dw		1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	C4-Phenanthrenes/Anthracenes	47	ug/kg dw		1.39						
DR091	1.5	EPA SI	8/31/1998	Cadmium	0.3	mg/kg dw		0.86		5.1	6.7	mg/kg dw	0.059	0.045
DR092	1.6	EPA SI	8/27/1998	Cadmium	0.2	mg/kg dw		0.7		5.1	6.7	mg/kg dw	0.039	0.03
DR144	1.5	EPA SI	8/17/1998	Cadmium	0.64	mg/kg dw		1.84		5.1	6.7	mg/kg dw	0.13	0.096
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Cadmium	0.19	mg/kg dw		1.48		5.1	6.7	mg/kg dw	0.037	0.028
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Cadmium	0.03	mg/kg dw	J	0.34		5.1	6.7	mg/kg dw	0.0059	0.0045
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Cadmium	0.05	mg/kg dw	J	0.98		5.1	6.7	mg/kg dw	0.0098	0.0075
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Cadmium	1.05	mg/kg dw		2.04		5.1	6.7	mg/kg dw	0.21	0.16
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Cadmium	0.16	mg/kg dw		1.18		5.1	6.7	mg/kg dw	0.031	0.024
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Cadmium	0.07	mg/kg dw		0.71		5.1	6.7	mg/kg dw	0.014	0.01
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Cadmium	0.24	mg/kg dw		2.9		5.1	6.7	mg/kg dw	0.047	0.036
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Cadmium	0.23	mg/kg dw		0.47		5.1	6.7	mg/kg dw	0.045	0.034
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Cadmium	0.49	mg/kg dw		1.01		5.1	6.7	mg/kg dw	0.096	0.073
B5b	1.5	LDWRI-Benthic	9/28/2004	Cadmium	0.257	mg/kg dw		1.39		5.1	6.7	mg/kg dw	0.05	0.038
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Cadmium	0.7	mg/kg dw		2.4		5.1	6.7	mg/kg dw	0.14	0.1
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Cadmium	0.5	mg/kg dw		2.02		5.1	6.7	mg/kg dw	0.098	0.075
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Cadmium	0.5	mg/kg dw		1.69		5.1	6.7	mg/kg dw	0.098	0.075

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Cadmium	0.4	mg/kg dw		2.44		5.1	6.7	mg/kg dw	0.078	0.06
DR025	1.2	EPA SI	8/17/1998	Cadmium	0.46	mg/kg dw		2.83		5.1	6.7	mg/kg dw	0.09	0.069
DR026	1.3	EPA SI	8/17/1998	Cadmium	0.49	mg/kg dw		3.24		5.1	6.7	mg/kg dw	0.096	0.073
DR027	1.3	EPA SI	8/17/1998	Cadmium	0.44	mg/kg dw		2.49		5.1	6.7	mg/kg dw	0.086	0.066
DR064	1.3	EPA SI	8/17/1998	Cadmium	0.45	mg/kg dw		2.58		5.1	6.7	mg/kg dw	0.088	0.067
B4b	1.4	LDWRI-Benthic	8/28/2004	Cadmium	0.58	mg/kg dw		2.79		5.1	6.7	mg/kg dw	0.11	0.087
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Cadmium	0.7	mg/kg dw		2.04		5.1	6.7	mg/kg dw	0.14	0.1
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Cadmium	0.6	mg/kg dw		2.11		5.1	6.7	mg/kg dw	0.12	0.09
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Cadmium	0.4	mg/kg dw		2.33		5.1	6.7	mg/kg dw	0.078	0.06
DR091	1.5	EPA SI	8/31/1998	Carbazole	30	ug/kg dw		0.86						
DR144	1.5	EPA SI	8/17/1998	Carbazole	50	ug/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Carbazole	20	ug/kg dw		1.39						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Carbazole	38	ug/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Carbazole	30	ug/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Carbazole	30	ug/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Carbazole	40	ug/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Carbazole	40	ug/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Carbazole	180	ug/kg dw	J	2.79						
DR092	1.6	EPA SI	8/27/1998	Carbon disulfide	0.84	ug/kg dw	J	0.7						
DR025	1.2	EPA SI	8/17/1998	Carbon disulfide	1.3	ug/kg dw	J	2.83						
DR091	1.5	EPA SI	8/31/1998	Chromium	26	mg/kg dw	J	0.86		260	270	mg/kg dw	0.1	0.096
DR092	1.6	EPA SI	8/27/1998	Chromium	15	mg/kg dw		0.7		260	270	mg/kg dw	0.058	0.056
DR144	1.5	EPA SI	8/17/1998	Chromium	36	mg/kg dw		1.84		260	270	mg/kg dw	0.14	0.13
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Chromium	11.6	mg/kg dw		1.48		260	270	mg/kg dw	0.045	0.043
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Chromium	7.2	mg/kg dw		0.34		260	270	mg/kg dw	0.028	0.027
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Chromium	4.8	mg/kg dw		0.98		260	270	mg/kg dw	0.018	0.018
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Chromium	24.2	mg/kg dw		2.04		260	270	mg/kg dw	0.093	0.09
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Chromium	14.5	mg/kg dw		1.18		260	270	mg/kg dw	0.056	0.054
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Chromium	10.1	mg/kg dw		0.71		260	270	mg/kg dw	0.039	0.037
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Chromium	19.8	mg/kg dw		2.9		260	270	mg/kg dw	0.076	0.073
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Chromium	23	mg/kg dw	J	0.47		260	270	mg/kg dw	0.088	0.085
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Chromium	24.5	mg/kg dw		1.01		260	270	mg/kg dw	0.094	0.091
B5b	1.5	LDWRI-Benthic	9/28/2004	Chromium	20.3	mg/kg dw		1.39		260	270	mg/kg dw	0.078	0.075
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Chromium	39	mg/kg dw		2.4		260	270	mg/kg dw	0.15	0.14
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Chromium	25.6	mg/kg dw		2.02		260	270	mg/kg dw	0.098	0.095
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Chromium	12.1	mg/kg dw		1.08		260	270	mg/kg dw	0.047	0.045
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Chromium	27	mg/kg dw		1.69		260	270	mg/kg dw	0.1	0.1
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Chromium	20.9	mg/kg dw		1.68		260	270	mg/kg dw	0.08	0.077
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Chromium	25.2	mg/kg dw		2.44		260	270	mg/kg dw	0.097	0.093
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Chromium	16	mg/kg dw		1.75		260	270	mg/kg dw	0.062	0.059
DR025	1.2	EPA SI	8/17/1998	Chromium	31	mg/kg dw		2.83		260	270	mg/kg dw	0.12	0.11
DR026	1.3	EPA SI	8/17/1998	Chromium	35	mg/kg dw		3.24		260	270	mg/kg dw	0.13	0.13
DR027	1.3	EPA SI	8/17/1998	Chromium	29	mg/kg dw		2.49		260	270	mg/kg dw	0.11	0.11
DR064	1.3	EPA SI	8/17/1998	Chromium	30	mg/kg dw		2.58		260	270	mg/kg dw	0.12	0.11
B4b	1.4	LDWRI-Benthic	8/28/2004	Chromium	37.7	mg/kg dw		2.79		260	270	mg/kg dw	0.15	0.14
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Chromium	36.6	mg/kg dw		2.04		260	270	mg/kg dw	0.14	0.14
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Chromium	34	mg/kg dw		2.11		260	270	mg/kg dw	0.13	0.13
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Chromium	32	mg/kg dw		2.33		260	270	mg/kg dw	0.12	0.12
DR091	1.5	EPA SI	8/31/1998	Chrysene	0.38	mg/kg dw		0.86	44	110	460	mg/kg OC	0.4	0.096
DR092	1.6	EPA SI	8/27/1998	Chrysene	0.18	mg/kg dw		0.7	26	110	460	mg/kg OC	0.24	0.057
DR144	1.5	EPA SI	8/17/1998	Chrysene	0.41	mg/kg dw		1.84	22	110	460	mg/kg OC	0.2	0.048
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Chrysene	4.1	mg/kg dw		1.48	280	110	460	mg/kg OC	2.5	0.61
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Chrysene	56	ug/kg dw		0.34		1400	2800	ug/kg dw	0.04	0.02
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Chrysene	0.22	mg/kg dw		0.98	22	110	460	mg/kg OC	0.2	0.048
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Chrysene	0.2	mg/kg dw	J	2.04	9.8	110	460	mg/kg OC	0.089	0.021
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Chrysene	0.14	mg/kg dw		1.18	12	110	460	mg/kg OC	0.11	0.026

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Chrysene	0.027	mg/kg dw		0.71	3.8	110	460	mg/kg OC	0.035	0.0083
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Chrysene	0.1	mg/kg dw		2.9	3.4	110	460	mg/kg OC	0.031	0.0074
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Chrysene	140	ug/kg dw		0.47		1400	2800	ug/kg dw	0.1	0.05
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Chrysene	0.81	mg/kg dw		1.01	80	110	460	mg/kg OC	0.73	0.17
B5b	1.5	LDWRI-Benthic	9/28/2004	Chrysene	0.51	mg/kg dw		1.39	37	110	460	mg/kg OC	0.34	0.08
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Chrysene	0.24	mg/kg dw		2.4	10	110	460	mg/kg OC	0.091	0.022
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Chrysene	0.43	mg/kg dw		2.02	21	110	460	mg/kg OC	0.19	0.046
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Chrysene	0.084	mg/kg dw		1.08	7.8	110	460	mg/kg OC	0.071	0.017
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Chrysene	0.53	mg/kg dw		1.69	31	110	460	mg/kg OC	0.28	0.067
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Chrysene	0.071	mg/kg dw		1.68	4.2	110	460	mg/kg OC	0.038	0.0091
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Chrysene	0.18	mg/kg dw		2.44	7.4	110	460	mg/kg OC	0.067	0.016
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Chrysene	0.52	mg/kg dw		1.75	30	110	460	mg/kg OC	0.27	0.065
DR025	1.2	EPA SI	8/17/1998	Chrysene	0.61	mg/kg dw		2.83	22	110	460	mg/kg OC	0.2	0.048
DR026	1.3	EPA SI	8/17/1998	Chrysene	0.48	mg/kg dw		3.24	15	110	460	mg/kg OC	0.14	0.033
DR027	1.3	EPA SI	8/17/1998	Chrysene	0.54	mg/kg dw		2.49	22	110	460	mg/kg OC	0.2	0.048
DR064	1.3	EPA SI	8/17/1998	Chrysene	0.47	mg/kg dw		2.58	18	110	460	mg/kg OC	0.16	0.039
B4b	1.4	LDWRI-Benthic	8/28/2004	Chrysene	0.43	mg/kg dw		2.79	15	110	460	mg/kg OC	0.14	0.033
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Chrysene	0.35	mg/kg dw		2.04	17	110	460	mg/kg OC	0.15	0.037
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Chrysene	0.53	mg/kg dw		2.11	25	110	460	mg/kg OC	0.23	0.054
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Chrysene	0.38	mg/kg dw		2.33	16	110	460	mg/kg OC	0.15	0.035
DR091	1.5	EPA SI	8/31/1998	Cobalt	5	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Cobalt	5	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Cobalt	10	mg/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Cobalt	7.1	mg/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Cobalt	10.8	mg/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Cobalt	7.6	mg/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Cobalt	4.4	mg/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Cobalt	10.8	mg/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Cobalt	6.6	mg/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Cobalt	7.8	mg/kg dw		2.44						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Cobalt	4.6	mg/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Cobalt	9	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Cobalt	10	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Cobalt	9	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Cobalt	10	mg/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Cobalt	12	mg/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Cobalt	10	mg/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Cobalt	9.2	mg/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Cobalt	9.2	mg/kg dw		2.33						
DR091	1.5	EPA SI	8/31/1998	Copper	50	mg/kg dw	J	0.86		390	390	mg/kg dw	0.13	0.13
DR092	1.6	EPA SI	8/27/1998	Copper	26	mg/kg dw		0.7		390	390	mg/kg dw	0.067	0.067
DR144	1.5	EPA SI	8/17/1998	Copper	77	mg/kg dw		1.84		390	390	mg/kg dw	0.2	0.2
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Copper	25.7	mg/kg dw		1.48		390	390	mg/kg dw	0.066	0.066
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Copper	11.5	mg/kg dw		0.34		390	390	mg/kg dw	0.029	0.029
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Copper	18.8	mg/kg dw		0.98		390	390	mg/kg dw	0.048	0.048
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Copper	195	mg/kg dw		2.04		390	390	mg/kg dw	0.5	0.5
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Copper	21.4	mg/kg dw		1.18		390	390	mg/kg dw	0.055	0.055
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Copper	16.1	mg/kg dw		0.71		390	390	mg/kg dw	0.041	0.041
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Copper	37.7	mg/kg dw		2.9		390	390	mg/kg dw	0.097	0.097
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Copper	40.9	mg/kg dw	J	0.47		390	390	mg/kg dw	0.1	0.1
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Copper	62.9	mg/kg dw		1.01		390	390	mg/kg dw	0.16	0.16
B5b	1.5	LDWRI-Benthic	9/28/2004	Copper	42	mg/kg dw		1.39		390	390	mg/kg dw	0.11	0.11
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Copper	106	mg/kg dw		2.4		390	390	mg/kg dw	0.27	0.27
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Copper	66.2	mg/kg dw		2.02		390	390	mg/kg dw	0.17	0.17
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Copper	18.4	mg/kg dw		1.08		390	390	mg/kg dw	0.047	0.047
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Copper	107	mg/kg dw		1.69		390	390	mg/kg dw	0.27	0.27

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Copper	38.4	mg/kg dw		1.68		390	390	mg/kg dw	0.098	0.098
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Copper	58.9	mg/kg dw		2.44		390	390	mg/kg dw	0.15	0.15
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Copper	31.8	mg/kg dw	J	1.75		390	390	mg/kg dw	0.082	0.082
DR025	1.2	EPA SI	8/17/1998	Copper	73	mg/kg dw		2.83		390	390	mg/kg dw	0.19	0.19
DR026	1.3	EPA SI	8/17/1998	Copper	77	mg/kg dw		3.24		390	390	mg/kg dw	0.2	0.2
DR027	1.3	EPA SI	8/17/1998	Copper	70	mg/kg dw		2.49		390	390	mg/kg dw	0.18	0.18
DR064	1.3	EPA SI	8/17/1998	Copper	72	mg/kg dw		2.58		390	390	mg/kg dw	0.18	0.18
B4b	1.4	LDWRI-Benthic	8/28/2004	Copper	86.6	mg/kg dw		2.79		390	390	mg/kg dw	0.22	0.22
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Copper	107	mg/kg dw		2.04		390	390	mg/kg dw	0.27	0.27
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Copper	96	mg/kg dw		2.11		390	390	mg/kg dw	0.25	0.25
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Copper	82	mg/kg dw		2.33		390	390	mg/kg dw	0.21	0.21
B5b	1.5	LDWRI-Benthic	9/28/2004	DDTs (total-calc'd)	20.9	ug/kg dw	JN	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	DDTs (total-calc'd)	6.3	ug/kg dw	JN	2.79						
DR091	1.5	EPA SI	8/31/1998	Dibenzo(a,h)anthracene	0.04	mg/kg dw		0.86	4.7	12	33	mg/kg OC	0.39	0.14
DR144	1.5	EPA SI	8/17/1998	Dibenzo(a,h)anthracene	0.05	mg/kg dw		1.84	2.7	12	33	mg/kg OC	0.23	0.082
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.035	mg/kg dw		1.48	2.4	12	33	mg/kg OC	0.2	0.073
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	2	ug/kg dw	J	0.34		230	540	ug/kg dw	0.0087	0.0037
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.02	mg/kg dw	J	0.98	2	12	33	mg/kg OC	0.17	0.061
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.02	mg/kg dw	J	2.04	0.98	12	33	mg/kg OC	0.082	0.03
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.01	mg/kg dw	J	1.18	0.85	12	33	mg/kg OC	0.071	0.026
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.003	mg/kg dw	J	0.71	0.42	12	33	mg/kg OC	0.035	0.013
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	10	ug/kg dw	J	0.47		230	540	ug/kg dw	0.043	0.019
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Dibenzo(a,h)anthracene	0.047	mg/kg dw		1.01	4.7	12	33	mg/kg OC	0.39	0.14
B5b	1.5	LDWRI-Benthic	9/28/2004	Dibenzo(a,h)anthracene	0.024	mg/kg dw		1.39	1.7	12	33	mg/kg OC	0.14	0.052
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Dibenzo(a,h)anthracene	0.028	mg/kg dw		1.75	1.6	12	33	mg/kg OC	0.13	0.048
DR025	1.2	EPA SI	8/17/1998	Dibenzo(a,h)anthracene	0.05	mg/kg dw		2.83	1.8	12	33	mg/kg OC	0.15	0.055
DR026	1.3	EPA SI	8/17/1998	Dibenzo(a,h)anthracene	0.05	mg/kg dw		3.24	1.5	12	33	mg/kg OC	0.13	0.045
DR027	1.3	EPA SI	8/17/1998	Dibenzo(a,h)anthracene	0.05	mg/kg dw		2.49	2	12	33	mg/kg OC	0.17	0.061
DR064	1.3	EPA SI	8/17/1998	Dibenzo(a,h)anthracene	0.05	mg/kg dw		2.58	1.9	12	33	mg/kg OC	0.16	0.058
B4b	1.4	LDWRI-Benthic	8/28/2004	Dibenzo(a,h)anthracene	0.026	mg/kg dw		2.79	0.93	12	33	mg/kg OC	0.078	0.028
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Dibenzo(a,h)anthracene	0.038	mg/kg dw		2.11	1.8	12	33	mg/kg OC	0.15	0.055
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Dibenzo(a,h)anthracene	0.037	mg/kg dw		2.33	1.6	12	33	mg/kg OC	0.13	0.048
DR091	1.5	EPA SI	8/31/1998	Dibenzofuran	0.06	mg/kg dw		0.86	7	15	58	mg/kg OC	0.47	0.12
DR092	1.6	EPA SI	8/27/1998	Dibenzofuran	0.04	mg/kg dw		0.7	5.7	15	58	mg/kg OC	0.38	0.098
DR144	1.5	EPA SI	8/17/1998	Dibenzofuran	0.07	mg/kg dw		1.84	3.8	15	58	mg/kg OC	0.25	0.066
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.02	mg/kg dw	J	1.48	1.4	15	58	mg/kg OC	0.093	0.024
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Dibenzofuran	1	ug/kg dw	J	0.34		540	700	ug/kg dw	0.0019	0.0014
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.046	mg/kg dw		0.98	4.7	15	58	mg/kg OC	0.31	0.081
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.007	mg/kg dw	J	2.04	0.34	15	58	mg/kg OC	0.023	0.0059
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.004	mg/kg dw	J	1.18	0.34	15	58	mg/kg OC	0.023	0.0059
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.001	mg/kg dw	J	0.71	0.14	15	58	mg/kg OC	0.0093	0.0024
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.003	mg/kg dw	J	2.9	0.1	15	58	mg/kg OC	0.0067	0.0017
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Dibenzofuran	23	ug/kg dw		0.47		540	700	ug/kg dw	0.043	0.033
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Dibenzofuran	0.01	mg/kg dw	J	1.01	0.99	15	58	mg/kg OC	0.066	0.017
B5b	1.5	LDWRI-Benthic	9/28/2004	Dibenzofuran	0.011	mg/kg dw		1.39	0.79	15	58	mg/kg OC	0.053	0.014
DR025	1.2	EPA SI	8/17/1998	Dibenzofuran	0.04	mg/kg dw		2.83	1.4	15	58	mg/kg OC	0.093	0.024
DR026	1.3	EPA SI	8/17/1998	Dibenzofuran	0.02	mg/kg dw		3.24	0.62	15	58	mg/kg OC	0.041	0.011
DR027	1.3	EPA SI	8/17/1998	Dibenzofuran	0.03	mg/kg dw		2.49	1.2	15	58	mg/kg OC	0.08	0.021
DR064	1.3	EPA SI	8/17/1998	Dibenzofuran	0.04	mg/kg dw		2.58	1.6	15	58	mg/kg OC	0.11	0.028
B4b	1.4	LDWRI-Benthic	8/28/2004	Dibenzofuran	0.013	mg/kg dw		2.79	0.47	15	58	mg/kg OC	0.031	0.0081
B5b	1.5	LDWRI-Benthic	9/28/2004	Dibenzothiophene	6.8	ug/kg dw		1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Dibenzothiophene	9	ug/kg dw		2.79						
DR092	1.6	EPA SI	8/27/1998	Dibutyltin as ion	7	ug/kg dw	J	0.7						
B5b	1.5	LDWRI-Benthic	9/28/2004	Dibutyltin as ion	18	ug/kg dw		1.39						
DR025	1.2	EPA SI	8/17/1998	Dibutyltin as ion	35	ug/kg dw	J	2.83						
B4b	1.4	LDWRI-Benthic	8/28/2004	Dibutyltin as ion	44	ug/kg dw		2.79						

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Diethyl phthalate	0.002	mg/kg dw	J	1.48	0.14	61	110	mg/kg OC	0.0023	0.0013
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Diethyl phthalate	0.002	mg/kg dw	J	0.98	0.2	61	110	mg/kg OC	0.0033	0.0018
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Diethyl phthalate	0.007	mg/kg dw	J	2.04	0.34	61	110	mg/kg OC	0.0056	0.0031
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Diethyl phthalate	0.005	mg/kg dw	J	2.9	0.17	61	110	mg/kg OC	0.0028	0.0015
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Dimethyl phthalate	0.002	mg/kg dw	J	1.48	0.14	53	53	mg/kg OC	0.0026	0.0026
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Dimethyl phthalate	0.005	mg/kg dw	J	2.04	0.25	53	53	mg/kg OC	0.0047	0.0047
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Dimethyl phthalate	0.002	mg/kg dw	J	1.01	0.2	53	53	mg/kg OC	0.0038	0.0038
B5b	1.5	LDWRI-Benthic	9/28/2004	Dimethyl phthalate	0.0036	mg/kg dw	J	1.39	0.26	53	53	mg/kg OC	0.0049	0.0049
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Dimethyl phthalate	0.0062	mg/kg dw		2.11	0.29	53	53	mg/kg OC	0.0055	0.0055
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Dimethyl phthalate	0.0086	mg/kg dw		2.33	0.37	53	53	mg/kg OC	0.007	0.007
DR144	1.5	EPA SI	8/17/1998	Di-n-butyl phthalate	0.02	mg/kg dw		1.84	1.1	220	1700	mg/kg OC	0.005	0.00065
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.008	mg/kg dw	J	1.48	0.54	220	1700	mg/kg OC	0.0025	0.00032
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.003	mg/kg dw	J	0.98	0.31	220	1700	mg/kg OC	0.0014	0.00018
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.035	mg/kg dw		1.18	3	220	1700	mg/kg OC	0.014	0.0018
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.004	mg/kg dw	J	0.71	0.56	220	1700	mg/kg OC	0.0025	0.00033
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.009	mg/kg dw	J	2.9	0.31	220	1700	mg/kg OC	0.0014	0.00018
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	5	ug/kg dw	J	0.47		1400	5100	ug/kg dw	0.0036	0.00098
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Di-n-butyl phthalate	0.005	mg/kg dw	J	1.01	0.5	220	1700	mg/kg OC	0.0023	0.00029
B5b	1.5	LDWRI-Benthic	9/28/2004	Di-n-butyl phthalate	0.0086	mg/kg dw	J	1.39	0.62	220	1700	mg/kg OC	0.0028	0.00036
DR025	1.2	EPA SI	8/17/1998	Di-n-butyl phthalate	0.03	mg/kg dw		2.83	1.1	220	1700	mg/kg OC	0.005	0.00065
DR026	1.3	EPA SI	8/17/1998	Di-n-butyl phthalate	0.03	mg/kg dw		3.24	0.93	220	1700	mg/kg OC	0.0042	0.00055
DR027	1.3	EPA SI	8/17/1998	Di-n-butyl phthalate	0.03	mg/kg dw		2.49	1.2	220	1700	mg/kg OC	0.0055	0.00071
DR064	1.3	EPA SI	8/17/1998	Di-n-butyl phthalate	0.03	mg/kg dw		2.58	1.2	220	1700	mg/kg OC	0.0055	0.00071
B4b	1.4	LDWRI-Benthic	8/28/2004	Di-n-butyl phthalate	0.0093	mg/kg dw	J	2.79	0.33	220	1700	mg/kg OC	0.0015	0.00019
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Di-n-octyl phthalate	0.046	mg/kg dw		1.48	3.1	58	4500	mg/kg OC	0.053	0.00069
DR091	1.5	EPA SI	8/31/1998	Fluoranthene	1.1	mg/kg dw		0.86	130	160	1200	mg/kg OC	0.81	0.11
DR092	1.6	EPA SI	8/27/1998	Fluoranthene	0.4	mg/kg dw		0.7	57	160	1200	mg/kg OC	0.36	0.048
DR144	1.5	EPA SI	8/17/1998	Fluoranthene	0.8	mg/kg dw		1.84	43	160	1200	mg/kg OC	0.27	0.036
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Fluoranthene	2.2	mg/kg dw		1.48	150	160	1200	mg/kg OC	0.94	0.13
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Fluoranthene	53	ug/kg dw		0.34		1700	2500	ug/kg dw	0.031	0.021
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Fluoranthene	0.96	mg/kg dw		0.98	98	160	1200	mg/kg OC	0.61	0.082
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Fluoranthene	0.1	mg/kg dw	J	2.04	4.9	160	1200	mg/kg OC	0.031	0.0041
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Fluoranthene	0.17	mg/kg dw		1.18	14	160	1200	mg/kg OC	0.088	0.012
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Fluoranthene	0.045	mg/kg dw		0.71	6.3	160	1200	mg/kg OC	0.039	0.0053
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Fluoranthene	0.085	mg/kg dw		2.9	2.9	160	1200	mg/kg OC	0.018	0.0024
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Fluoranthene	210	ug/kg dw		0.47		1700	2500	ug/kg dw	0.12	0.084
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Fluoranthene	0.81	mg/kg dw		1.01	80	160	1200	mg/kg OC	0.5	0.067
B5b	1.5	LDWRI-Benthic	9/28/2004	Fluoranthene	0.89	mg/kg dw		1.39	64	160	1200	mg/kg OC	0.4	0.053
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Fluoranthene	0.25	mg/kg dw		2.4	10	160	1200	mg/kg OC	0.063	0.0083
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Fluoranthene	0.42	mg/kg dw		2.02	21	160	1200	mg/kg OC	0.13	0.018
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Fluoranthene	0.18	mg/kg dw		1.08	17	160	1200	mg/kg OC	0.11	0.014
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Fluoranthene	0.82	mg/kg dw		1.69	49	160	1200	mg/kg OC	0.31	0.041
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Fluoranthene	0.068	mg/kg dw		1.68	4	160	1200	mg/kg OC	0.025	0.0033
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Fluoranthene	0.28	mg/kg dw		2.44	11	160	1200	mg/kg OC	0.069	0.0092
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Fluoranthene	0.74	mg/kg dw		1.75	42	160	1200	mg/kg OC	0.26	0.035
DR025	1.2	EPA SI	8/17/1998	Fluoranthene	1.2	mg/kg dw		2.83	42	160	1200	mg/kg OC	0.26	0.035
DR026	1.3	EPA SI	8/17/1998	Fluoranthene	0.81	mg/kg dw		3.24	25	160	1200	mg/kg OC	0.16	0.021
DR027	1.3	EPA SI	8/17/1998	Fluoranthene	0.85	mg/kg dw		2.49	34	160	1200	mg/kg OC	0.21	0.028
DR064	1.3	EPA SI	8/17/1998	Fluoranthene	0.91	mg/kg dw		2.58	35	160	1200	mg/kg OC	0.22	0.029
B4b	1.4	LDWRI-Benthic	8/28/2004	Fluoranthene	0.62	mg/kg dw		2.79	22	160	1200	mg/kg OC	0.14	0.018
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Fluoranthene	0.47	mg/kg dw		2.04	23	160	1200	mg/kg OC	0.14	0.019
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Fluoranthene	0.86	mg/kg dw		2.11	41	160	1200	mg/kg OC	0.26	0.034
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Fluoranthene	0.52	mg/kg dw		2.33	22	160	1200	mg/kg OC	0.14	0.018
DR091	1.5	EPA SI	8/31/1998	Fluorene	0.09	mg/kg dw		0.86	10	23	79	mg/kg OC	0.43	0.13
DR092	1.6	EPA SI	8/27/1998	Fluorene	0.05	mg/kg dw		0.7	7.1	23	79	mg/kg OC	0.31	0.09
DR144	1.5	EPA SI	8/17/1998	Fluorene	0.1	mg/kg dw		1.84	5.4	23	79	mg/kg OC	0.23	0.068

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Fluorene	0.056	mg/kg dw		1.48	3.8	23	79	mg/kg OC	0.17	0.048
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Fluorene	4	ug/kg dw	J	0.34		540	1000	ug/kg dw	0.0074	0.004
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Fluorene	0.064	mg/kg dw		0.98	6.5	23	79	mg/kg OC	0.28	0.082
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Fluorene	0.02	mg/kg dw	J	2.04	0.98	23	79	mg/kg OC	0.043	0.012
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Fluorene	0.01	mg/kg dw	J	1.18	0.85	23	79	mg/kg OC	0.037	0.011
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Fluorene	0.008	mg/kg dw	J	2.9	0.28	23	79	mg/kg OC	0.012	0.0035
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Fluorene	29	ug/kg dw		0.47		540	1000	ug/kg dw	0.054	0.029
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Fluorene	0.035	mg/kg dw		1.01	3.5	23	79	mg/kg OC	0.15	0.044
B5b	1.5	LDWRI-Benthic	9/28/2004	Fluorene	0.018	mg/kg dw		1.39	1.3	23	79	mg/kg OC	0.057	0.016
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Fluorene	0.028	mg/kg dw		1.75	1.6	23	79	mg/kg OC	0.07	0.02
DR025	1.2	EPA SI	8/17/1998	Fluorene	0.05	mg/kg dw		2.83	1.8	23	79	mg/kg OC	0.078	0.023
DR026	1.3	EPA SI	8/17/1998	Fluorene	0.04	mg/kg dw		3.24	1.2	23	79	mg/kg OC	0.052	0.015
DR027	1.3	EPA SI	8/17/1998	Fluorene	0.06	mg/kg dw		2.49	2.4	23	79	mg/kg OC	0.1	0.03
DR064	1.3	EPA SI	8/17/1998	Fluorene	0.06	mg/kg dw		2.58	2.3	23	79	mg/kg OC	0.1	0.029
B4b	1.4	LDWRI-Benthic	8/28/2004	Fluorene	0.019	mg/kg dw		2.79	0.68	23	79	mg/kg OC	0.03	0.0086
B5b	1.5	LDWRI-Benthic	9/28/2004	Heptachlor epoxide	0.0049	mg/kg dw	JN	1.39						
DR091	1.5	EPA SI	8/31/1998	Indeno(1,2,3-cd)pyrene	0.12	mg/kg dw		0.86	14	34	88	mg/kg OC	0.41	0.16
DR092	1.6	EPA SI	8/27/1998	Indeno(1,2,3-cd)pyrene	0.06	mg/kg dw		0.7	8.6	34	88	mg/kg OC	0.25	0.098
DR144	1.5	EPA SI	8/17/1998	Indeno(1,2,3-cd)pyrene	0.16	mg/kg dw		1.84	8.7	34	88	mg/kg OC	0.26	0.099
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.13	mg/kg dw		1.48	8.8	34	88	mg/kg OC	0.26	0.1
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	7	ug/kg dw	J	0.34		600	690	ug/kg dw	0.012	0.01
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.067	mg/kg dw		0.98	6.8	34	88	mg/kg OC	0.2	0.077
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.1	mg/kg dw	J	2.04	4.9	34	88	mg/kg OC	0.14	0.056
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.055	mg/kg dw		1.18	4.7	34	88	mg/kg OC	0.14	0.053
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.01	mg/kg dw	J	0.71	1.4	34	88	mg/kg OC	0.041	0.016
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.02	mg/kg dw	J	2.9	0.69	34	88	mg/kg OC	0.02	0.0078
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	44	ug/kg dw		0.47		600	690	ug/kg dw	0.073	0.064
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Indeno(1,2,3-cd)pyrene	0.17	mg/kg dw		1.01	17	34	88	mg/kg OC	0.5	0.19
B5b	1.5	LDWRI-Benthic	9/28/2004	Indeno(1,2,3-cd)pyrene	0.13	mg/kg dw		1.39	9.4	34	88	mg/kg OC	0.28	0.11
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Indeno(1,2,3-cd)pyrene	0.032	mg/kg dw		2.4	1.3	34	88	mg/kg OC	0.038	0.015
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Indeno(1,2,3-cd)pyrene	0.03	mg/kg dw		2.02	1.5	34	88	mg/kg OC	0.044	0.017
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Indeno(1,2,3-cd)pyrene	0.13	mg/kg dw		1.69	7.7	34	88	mg/kg OC	0.23	0.088
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Indeno(1,2,3-cd)pyrene	0.037	mg/kg dw		1.68	2.2	34	88	mg/kg OC	0.065	0.025
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Indeno(1,2,3-cd)pyrene	0.063	mg/kg dw		2.44	2.6	34	88	mg/kg OC	0.076	0.03
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Indeno(1,2,3-cd)pyrene	0.074	mg/kg dw		1.75	4.2	34	88	mg/kg OC	0.12	0.048
DR025	1.2	EPA SI	8/17/1998	Indeno(1,2,3-cd)pyrene	0.23	mg/kg dw		2.83	8.1	34	88	mg/kg OC	0.24	0.092
DR026	1.3	EPA SI	8/17/1998	Indeno(1,2,3-cd)pyrene	0.22	mg/kg dw		3.24	6.8	34	88	mg/kg OC	0.2	0.077
DR027	1.3	EPA SI	8/17/1998	Indeno(1,2,3-cd)pyrene	0.22	mg/kg dw		2.49	8.8	34	88	mg/kg OC	0.26	0.1
DR064	1.3	EPA SI	8/17/1998	Indeno(1,2,3-cd)pyrene	0.21	mg/kg dw		2.58	8.1	34	88	mg/kg OC	0.24	0.092
B4b	1.4	LDWRI-Benthic	8/28/2004	Indeno(1,2,3-cd)pyrene	0.14	mg/kg dw		2.79	5	34	88	mg/kg OC	0.15	0.057
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Indeno(1,2,3-cd)pyrene	0.02	mg/kg dw		2.04	0.98	34	88	mg/kg OC	0.029	0.011
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Indeno(1,2,3-cd)pyrene	0.13	mg/kg dw		2.11	6.2	34	88	mg/kg OC	0.18	0.07
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Indeno(1,2,3-cd)pyrene	0.098	mg/kg dw		2.33	4.2	34	88	mg/kg OC	0.12	0.048
DR091	1.5	EPA SI	8/31/1998	Iron	17900	mg/kg dw	J	0.86						
DR092	1.6	EPA SI	8/27/1998	Iron	15000	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Iron	26100	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Iron	29800	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Iron	32400	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Iron	28400	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Iron	30400	mg/kg dw		2.58						
DR091	1.5	EPA SI	8/31/1998	Lead	46.1	mg/kg dw	J	0.86		450	530	mg/kg dw	0.1	0.087
DR092	1.6	EPA SI	8/27/1998	Lead	15.7	mg/kg dw		0.7		450	530	mg/kg dw	0.035	0.03
DR144	1.5	EPA SI	8/17/1998	Lead	65.2	mg/kg dw		1.84		450	530	mg/kg dw	0.14	0.12
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Lead	134	mg/kg dw		1.48		450	530	mg/kg dw	0.3	0.25
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Lead	10.2	mg/kg dw		0.34		450	530	mg/kg dw	0.023	0.019
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Lead	13.7	mg/kg dw		0.98		450	530	mg/kg dw	0.03	0.026

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Lead	52.4	mg/kg dw		2.04		450	530	mg/kg dw	0.12	0.099
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Lead	29.2	mg/kg dw		1.18		450	530	mg/kg dw	0.065	0.055
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Lead	18.6	mg/kg dw		0.71		450	530	mg/kg dw	0.041	0.035
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Lead	40.3	mg/kg dw		2.9		450	530	mg/kg dw	0.09	0.076
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Lead	18.4	mg/kg dw		0.47		450	530	mg/kg dw	0.041	0.035
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Lead	101	mg/kg dw		1.01		450	530	mg/kg dw	0.22	0.19
B5b	1.5	LDWRI-Benthic	9/28/2004	Lead	30.8	mg/kg dw		1.39		450	530	mg/kg dw	0.068	0.058
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Lead	64	mg/kg dw		2.4		450	530	mg/kg dw	0.14	0.12
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Lead	38	mg/kg dw		2.02		450	530	mg/kg dw	0.084	0.072
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Lead	9	mg/kg dw		1.08		450	530	mg/kg dw	0.02	0.017
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Lead	50	mg/kg dw		1.69		450	530	mg/kg dw	0.11	0.094
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Lead	19	mg/kg dw		1.68		450	530	mg/kg dw	0.042	0.036
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Lead	34	mg/kg dw		2.44		450	530	mg/kg dw	0.076	0.064
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Lead	22	mg/kg dw		1.75		450	530	mg/kg dw	0.049	0.042
DR025	1.2	EPA SI	8/17/1998	Lead	45.3	mg/kg dw		2.83		450	530	mg/kg dw	0.1	0.085
DR026	1.3	EPA SI	8/17/1998	Lead	45.2	mg/kg dw		3.24		450	530	mg/kg dw	0.1	0.085
DR027	1.3	EPA SI	8/17/1998	Lead	43.8	mg/kg dw		2.49		450	530	mg/kg dw	0.097	0.083
DR064	1.3	EPA SI	8/17/1998	Lead	39.8	mg/kg dw		2.58		450	530	mg/kg dw	0.088	0.075
B4b	1.4	LDWRI-Benthic	8/28/2004	Lead	79.4	mg/kg dw		2.79		450	530	mg/kg dw	0.18	0.15
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Lead	62	mg/kg dw		2.04		450	530	mg/kg dw	0.14	0.12
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Lead	61	mg/kg dw		2.11		450	530	mg/kg dw	0.14	0.12
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Lead	45	mg/kg dw		2.33		450	530	mg/kg dw	0.1	0.085
DR091	1.5	EPA SI	8/31/1998	Manganese	192	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Manganese	140	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Manganese	266	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Manganese	349	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Manganese	356	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Manganese	317	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Manganese	341	mg/kg dw		2.58						
DR091	1.5	EPA SI	8/31/1998	Mercury	0.07	mg/kg dw		0.86		0.41	0.59	mg/kg dw	0.17	0.12
DR092	1.6	EPA SI	8/27/1998	Mercury	0.07	mg/kg dw		0.7		0.41	0.59	mg/kg dw	0.17	0.12
DR144	1.5	EPA SI	8/17/1998	Mercury	0.22	mg/kg dw		1.84		0.41	0.59	mg/kg dw	0.54	0.37
B5b	1.5	LDWRI-Benthic	9/28/2004	Mercury	0.095	mg/kg dw		1.39		0.41	0.59	mg/kg dw	0.23	0.16
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Mercury	0.3	mg/kg dw		2.4		0.41	0.59	mg/kg dw	0.73	0.51
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Mercury	0.19	mg/kg dw		2.02		0.41	0.59	mg/kg dw	0.46	0.32
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Mercury	0.15	mg/kg dw		1.69		0.41	0.59	mg/kg dw	0.37	0.25
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Mercury	0.08	mg/kg dw		1.68		0.41	0.59	mg/kg dw	0.2	0.14
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Mercury	0.12	mg/kg dw		2.44		0.41	0.59	mg/kg dw	0.29	0.2
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Mercury	0.08	mg/kg dw		1.75		0.41	0.59	mg/kg dw	0.2	0.14
DR025	1.2	EPA SI	8/17/1998	Mercury	0.26	mg/kg dw		2.83		0.41	0.59	mg/kg dw	0.63	0.44
DR026	1.3	EPA SI	8/17/1998	Mercury	0.22	mg/kg dw		3.24		0.41	0.59	mg/kg dw	0.54	0.37
DR027	1.3	EPA SI	8/17/1998	Mercury	0.21	mg/kg dw		2.49		0.41	0.59	mg/kg dw	0.51	0.36
DR064	1.3	EPA SI	8/17/1998	Mercury	0.23	mg/kg dw		2.58		0.41	0.59	mg/kg dw	0.56	0.39
B4b	1.4	LDWRI-Benthic	8/28/2004	Mercury	0.291	mg/kg dw		2.79		0.41	0.59	mg/kg dw	0.71	0.49
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Mercury	0.31	mg/kg dw		2.04		0.41	0.59	mg/kg dw	0.76	0.53
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Mercury	0.3	mg/kg dw		2.11		0.41	0.59	mg/kg dw	0.73	0.51
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Mercury	0.25	mg/kg dw		2.33		0.41	0.59	mg/kg dw	0.61	0.42
DR025	1.2	EPA SI	8/17/1998	Methyl ethyl ketone	13.5	ug/kg dw		2.83						
B5b	1.5	LDWRI-Benthic	9/28/2004	Mirex	0.29	ug/kg dw	JN	1.39						
B5b	1.5	LDWRI-Benthic	9/28/2004	Molybdenum	1.08	mg/kg dw	J	1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Molybdenum	2	mg/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Molybdenum	2.2	mg/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Molybdenum	0.8	mg/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Molybdenum	2.4	mg/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Molybdenum	1.1	mg/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Molybdenum	1.4	mg/kg dw		2.44						

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Molybdenum	1.4	mg/kg dw		1.75						
B4b	1.4	LDWRI-Benthic	8/28/2004	Molybdenum	1.01	mg/kg dw	J	2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Molybdenum	2.1	mg/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Molybdenum	0.9	mg/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Molybdenum	0.5	mg/kg dw		2.33						
B5b	1.5	LDWRI-Benthic	9/28/2004	Monobutyltin as ion	14	ug/kg dw		1.39						
DR025	1.2	EPA SI	8/17/1998	Monobutyltin as ion	56	ug/kg dw	J	2.83						
B4b	1.4	LDWRI-Benthic	8/28/2004	Monobutyltin as ion	48	ug/kg dw		2.79						
DR091	1.5	EPA SI	8/31/1998	Naphthalene	0.02	mg/kg dw		0.86	2.3	99	170	mg/kg OC	0.023	0.014
DR144	1.5	EPA SI	8/17/1998	Naphthalene	0.07	mg/kg dw		1.84	3.8	99	170	mg/kg OC	0.038	0.022
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Naphthalene	0.009	mg/kg dw	J	1.48	0.61	99	170	mg/kg OC	0.0062	0.0036
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Naphthalene	3	ug/kg dw	J	0.34		2100	2400	ug/kg dw	0.0014	0.0013
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Naphthalene	0.01	mg/kg dw	J	0.98	1	99	170	mg/kg OC	0.01	0.0059
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Naphthalene	0.005	mg/kg dw	J	2.04	0.25	99	170	mg/kg OC	0.0025	0.0015
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Naphthalene	0.006	mg/kg dw	J	1.18	0.51	99	170	mg/kg OC	0.0052	0.003
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Naphthalene	0.01	mg/kg dw	J	2.9	0.34	99	170	mg/kg OC	0.0034	0.002
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Naphthalene	10	ug/kg dw	J	0.47		2100	2400	ug/kg dw	0.0048	0.0042
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Naphthalene	0.004	mg/kg dw	J	1.01	0.4	99	170	mg/kg OC	0.004	0.0024
B5b	1.5	LDWRI-Benthic	9/28/2004	Naphthalene	0.01	mg/kg dw		1.39	0.72	99	170	mg/kg OC	0.0073	0.0042
DR025	1.2	EPA SI	8/17/1998	Naphthalene	0.05	mg/kg dw		2.83	1.8	99	170	mg/kg OC	0.018	0.011
B4b	1.4	LDWRI-Benthic	8/28/2004	Naphthalene	0.023	mg/kg dw		2.79	0.82	99	170	mg/kg OC	0.0083	0.0048
DR091	1.5	EPA SI	8/31/1998	Nickel	13.7	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Nickel	13.6	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Nickel	21.9	mg/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Nickel	14	mg/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Nickel	26	mg/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Nickel	18	mg/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Nickel	9	mg/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Nickel	20	mg/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Nickel	15	mg/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Nickel	17	mg/kg dw		2.44						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Nickel	11	mg/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Nickel	23.8	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Nickel	23.8	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Nickel	20.5	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Nickel	22.8	mg/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Nickel	24.8	mg/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Nickel	23	mg/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Nickel	28	mg/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Nickel	28	mg/kg dw		2.33						
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	N-Nitrosodiphenylamine	0.008	mg/kg dw	J	2.04	0.39	11	11	mg/kg OC	0.035	0.035
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	N-Nitrosodiphenylamine	0.0065	mg/kg dw		2.02	0.32	11	11	mg/kg OC	0.029	0.029
DR092	1.6	EPA SI	8/27/1998	OCDD	2700	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	OCDD	2380	ng/kg dw		1.69						
DR092	1.6	EPA SI	8/27/1998	OCDF	120	ng/kg dw		0.7						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	OCDF	144	ng/kg dw		1.69						
EIT082	1.5	NOAA SiteChar	11/12/1997	PCBs (total calc'd)	31	ug/kg dw	J	0.3		130	1000	ug/kg dw	0.24	0.031
EIT083	1.5	NOAA SiteChar	9/19/1997	PCBs (total calc'd)	0.049	mg/kg dw	J	1.11	4.4	12	65	mg/kg OC	0.37	0.068
EIT084	1.6	NOAA SiteChar	9/19/1997	PCBs (total calc'd)	0.0047	mg/kg dw	J	1.64	0.29	12	65	mg/kg OC	0.024	0.0045
EST208	1.6	NOAA SiteChar	9/19/1997	PCBs (total calc'd)	0.093	mg/kg dw	J	1.88	4.9	12	65	mg/kg OC	0.41	0.075
EST209	1.6	NOAA SiteChar	10/7/1997	PCBs (total calc'd)	0.09	mg/kg dw	J	1.98	5	12	65	mg/kg OC	0.42	0.077
DR091	1.5	EPA SI	8/31/1998	PCBs (total calc'd)	0.045	mg/kg dw		0.86	5.2	12	65	mg/kg OC	0.43	0.08
DR092	1.6	EPA SI	8/27/1998	PCBs (total calc'd)	0.064	mg/kg dw		0.7	9.1	12	65	mg/kg OC	0.76	0.14
DR144	1.5	EPA SI	8/17/1998	PCBs (total calc'd)	0.308	mg/kg dw		1.84	16.7	12	65	mg/kg OC	1.4	0.26
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.09	mg/kg dw	J	1.48	6.1	12	65	mg/kg OC	0.51	0.094
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.1	mg/kg dw	J	2.04	4.9	12	65	mg/kg OC	0.41	0.075

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.14	mg/kg dw	J	1.18	12	12	65	mg/kg OC	1	0.18
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.04	mg/kg dw	J	0.71	5.6	12	65	mg/kg OC	0.47	0.086
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.1	mg/kg dw	J	2.9	3.4	12	65	mg/kg OC	0.28	0.052
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	30	ug/kg dw	J	0.47		130	1000	ug/kg dw	0.23	0.03
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	PCBs (total calc'd)	0.69	mg/kg dw		1.01	68	12	65	mg/kg OC	5.7	1.0
B5b	1.5	LDWRI-Benthic	9/28/2004	PCBs (total calc'd)	0.28	mg/kg dw		1.39	20	12	65	mg/kg OC	1.7	0.31
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	PCBs (total calc'd)	0.209	mg/kg dw		2.4	8.71	12	65	mg/kg OC	0.73	0.13
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	PCBs (total calc'd)	0.091	mg/kg dw		2.02	4.5	12	65	mg/kg OC	0.38	0.069
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	PCBs (total calc'd)	0.25	mg/kg dw	J	1.08	23	12	65	mg/kg OC	1.9	0.35
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	PCBs (total calc'd)	0.127	mg/kg dw		1.69	7.51	12	65	mg/kg OC	0.63	0.12
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	PCBs (total calc'd)	0.062	mg/kg dw		1.68	3.7	12	65	mg/kg OC	0.31	0.057
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	PCBs (total calc'd)	0.141	mg/kg dw	J	2.44	5.78	12	65	mg/kg OC	0.48	0.089
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	PCBs (total calc'd)	0.107	mg/kg dw		1.75	6.11	12	65	mg/kg OC	0.51	0.094
EST204	1.3	NOAA SiteChar	10/23/1997	PCBs (total calc'd)	0.12	mg/kg dw		2.15	5.6	12	65	mg/kg OC	0.47	0.086
EST206	1.4	NOAA SiteChar	9/16/1997	PCBs (total calc'd)	0.12	mg/kg dw		1.97	6.1	12	65	mg/kg OC	0.51	0.094
DR025	1.2	EPA SI	8/17/1998	PCBs (total calc'd)	0.21	mg/kg dw		2.83	7.42	12	65	mg/kg OC	0.62	0.11
DR026	1.3	EPA SI	8/17/1998	PCBs (total calc'd)	0.28	mg/kg dw		3.24	8.6	12	65	mg/kg OC	0.72	0.13
DR027	1.3	EPA SI	8/17/1998	PCBs (total calc'd)	0.29	mg/kg dw		2.49	11.6	12	65	mg/kg OC	0.97	0.18
DR064	1.3	EPA SI	8/17/1998	PCBs (total calc'd)	0.227	mg/kg dw		2.58	8.8	12	65	mg/kg OC	0.73	0.14
B4b	1.4	LDWRI-Benthic	8/28/2004	PCBs (total calc'd)	0.4	mg/kg dw		2.79	14	12	65	mg/kg OC	1.2	0.22
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	PCBs (total calc'd)	0.108	mg/kg dw		2.04	5.29	12	65	mg/kg OC	0.44	0.081
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	PCBs (total calc'd)	0.27	mg/kg dw		2.11	13	12	65	mg/kg OC	1.1	0.2
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	PCBs (total calc'd)	0.214	mg/kg dw		2.33	9.18	12	65	mg/kg OC	0.77	0.14
EIT083	1.5	NOAA SiteChar	9/19/1997	PCTs (total)	91	ug/kg dw		1.11						
EST208	1.6	NOAA SiteChar	9/19/1997	PCTs (total)	17	ug/kg dw		1.88						
EST209	1.6	NOAA SiteChar	10/7/1997	PCTs (total)	20	ug/kg dw		1.98						
B5b	1.5	LDWRI-Benthic	9/28/2004	Perylene	74	ug/kg dw		1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Perylene	78	ug/kg dw		2.79						
DR091	1.5	EPA SI	8/31/1998	Phenanthrene	0.56	mg/kg dw		0.86	65	100	480	mg/kg OC	0.65	0.14
DR092	1.6	EPA SI	8/27/1998	Phenanthrene	0.23	mg/kg dw		0.7	33	100	480	mg/kg OC	0.33	0.069
DR144	1.5	EPA SI	8/17/1998	Phenanthrene	0.4	mg/kg dw		1.84	22	100	480	mg/kg OC	0.22	0.046
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Phenanthrene	0.35	mg/kg dw		1.48	24	100	480	mg/kg OC	0.24	0.05
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Phenanthrene	20	ug/kg dw	J	0.34		1500	5400	ug/kg dw	0.013	0.0037
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Phenanthrene	0.36	mg/kg dw		0.98	37	100	480	mg/kg OC	0.37	0.077
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Phenanthrene	0.037	mg/kg dw		2.04	1.8	100	480	mg/kg OC	0.018	0.0038
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Phenanthrene	0.048	mg/kg dw		1.18	4.1	100	480	mg/kg OC	0.041	0.0085
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Phenanthrene	0.01	mg/kg dw	J	0.71	1.4	100	480	mg/kg OC	0.014	0.0029
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Phenanthrene	0.036	mg/kg dw		2.9	1.2	100	480	mg/kg OC	0.012	0.0025
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Phenanthrene	82	ug/kg dw		0.47		1500	5400	ug/kg dw	0.055	0.015
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Phenanthrene	0.14	mg/kg dw		1.01	14	100	480	mg/kg OC	0.14	0.029
B5b	1.5	LDWRI-Benthic	9/28/2004	Phenanthrene	0.11	mg/kg dw		1.39	7.9	100	480	mg/kg OC	0.079	0.016
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Phenanthrene	0.074	mg/kg dw		2.4	3.1	100	480	mg/kg OC	0.031	0.0065
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Phenanthrene	0.2	mg/kg dw		2.02	9.9	100	480	mg/kg OC	0.099	0.021
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Phenanthrene	0.03	mg/kg dw		1.08	2.8	100	480	mg/kg OC	0.028	0.0058
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Phenanthrene	0.21	mg/kg dw		1.69	12	100	480	mg/kg OC	0.12	0.025
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Phenanthrene	0.028	mg/kg dw		1.68	1.7	100	480	mg/kg OC	0.017	0.0035
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Phenanthrene	0.073	mg/kg dw		2.44	3	100	480	mg/kg OC	0.03	0.0063
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Phenanthrene	0.18	mg/kg dw		1.75	10	100	480	mg/kg OC	0.1	0.021
DR025	1.2	EPA SI	8/17/1998	Phenanthrene	0.37	mg/kg dw		2.83	13	100	480	mg/kg OC	0.13	0.027
DR026	1.3	EPA SI	8/17/1998	Phenanthrene	0.29	mg/kg dw		3.24	9	100	480	mg/kg OC	0.09	0.019
DR027	1.3	EPA SI	8/17/1998	Phenanthrene	0.35	mg/kg dw		2.49	14	100	480	mg/kg OC	0.14	0.029
DR064	1.3	EPA SI	8/17/1998	Phenanthrene	0.38	mg/kg dw		2.58	15	100	480	mg/kg OC	0.15	0.031
B4b	1.4	LDWRI-Benthic	8/28/2004	Phenanthrene	0.16	mg/kg dw		2.79	5.7	100	480	mg/kg OC	0.057	0.012
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Phenanthrene	0.17	mg/kg dw		2.04	8.3	100	480	mg/kg OC	0.083	0.017
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Phenanthrene	0.27	mg/kg dw		2.11	13	100	480	mg/kg OC	0.13	0.027
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Phenanthrene	0.17	mg/kg dw		2.33	7.3	100	480	mg/kg OC	0.073	0.015

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR091	1.5	EPA SI	8/31/1998	Phenol	40	ug/kg dw		0.86		420	1200	ug/kg dw	0.095	0.033
DR092	1.6	EPA SI	8/27/1998	Phenol	520	ug/kg dw		0.7		420	1200	ug/kg dw	1.2	0.43
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Phenol	20	ug/kg dw		1.48		420	1200	ug/kg dw	0.048	0.017
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Phenol	60	ug/kg dw		2.04		420	1200	ug/kg dw	0.14	0.05
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Phenol	59	ug/kg dw		1.18		420	1200	ug/kg dw	0.14	0.049
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Phenol	31	ug/kg dw		0.71		420	1200	ug/kg dw	0.074	0.026
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Phenol	10	ug/kg dw	J	0.47		420	1200	ug/kg dw	0.024	0.0083
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Phenol	280	ug/kg dw		2.44		420	1200	ug/kg dw	0.67	0.23
DR025	1.2	EPA SI	8/17/1998	Phenol	90	ug/kg dw		2.83		420	1200	ug/kg dw	0.21	0.075
DR026	1.3	EPA SI	8/17/1998	Phenol	120	ug/kg dw		3.24		420	1200	ug/kg dw	0.29	0.1
DR027	1.3	EPA SI	8/17/1998	Phenol	270	ug/kg dw		2.49		420	1200	ug/kg dw	0.64	0.23
DR064	1.3	EPA SI	8/17/1998	Phenol	80	ug/kg dw		2.58		420	1200	ug/kg dw	0.19	0.067
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Phenol	180	ug/kg dw		2.04		420	1200	ug/kg dw	0.43	0.15
DR091	1.5	EPA SI	8/31/1998	Pyrene	0.82	mg/kg dw		0.86	95	1000	1400	mg/kg OC	0.095	0.068
DR092	1.6	EPA SI	8/27/1998	Pyrene	0.36	mg/kg dw		0.7	51	1000	1400	mg/kg OC	0.051	0.036
DR144	1.5	EPA SI	8/17/1998	Pyrene	0.97	mg/kg dw		1.84	53	1000	1400	mg/kg OC	0.053	0.038
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Pyrene	1.5	mg/kg dw		1.48	100	1000	1400	mg/kg OC	0.1	0.071
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Pyrene	42	ug/kg dw		0.34		2600	3300	ug/kg dw	0.016	0.013
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Pyrene	0.7	mg/kg dw		0.98	71	1000	1400	mg/kg OC	0.071	0.051
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Pyrene	0.21	mg/kg dw		2.04	10	1000	1400	mg/kg OC	0.01	0.0071
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Pyrene	0.15	mg/kg dw		1.18	13	1000	1400	mg/kg OC	0.013	0.0093
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Pyrene	0.034	mg/kg dw		0.71	4.8	1000	1400	mg/kg OC	0.0048	0.0034
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Pyrene	0.14	mg/kg dw		2.9	4.8	1000	1400	mg/kg OC	0.0048	0.0034
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Pyrene	160	ug/kg dw		0.47		2600	3300	ug/kg dw	0.062	0.048
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Pyrene	0.91	mg/kg dw		1.01	90	1000	1400	mg/kg OC	0.09	0.064
B5b	1.5	LDWRI-Benthic	9/28/2004	Pyrene	0.66	mg/kg dw		1.39	47	1000	1400	mg/kg OC	0.047	0.034
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Pyrene	0.15	mg/kg dw		2.4	6.3	1000	1400	mg/kg OC	0.0063	0.0045
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Pyrene	0.83	mg/kg dw		2.02	41	1000	1400	mg/kg OC	0.041	0.029
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Pyrene	0.099	mg/kg dw		1.08	9.2	1000	1400	mg/kg OC	0.0092	0.0066
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Pyrene	0.62	mg/kg dw		1.69	37	1000	1400	mg/kg OC	0.037	0.026
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Pyrene	0.13	mg/kg dw		1.68	7.7	1000	1400	mg/kg OC	0.0077	0.0055
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Pyrene	0.18	mg/kg dw		2.44	7.4	1000	1400	mg/kg OC	0.0074	0.0053
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Pyrene	0.42	mg/kg dw		1.75	24	1000	1400	mg/kg OC	0.024	0.017
DR025	1.2	EPA SI	8/17/1998	Pyrene	0.91	mg/kg dw		2.83	32	1000	1400	mg/kg OC	0.032	0.023
DR026	1.3	EPA SI	8/17/1998	Pyrene	0.75	mg/kg dw		3.24	23	1000	1400	mg/kg OC	0.023	0.016
DR027	1.3	EPA SI	8/17/1998	Pyrene	0.64	mg/kg dw		2.49	26	1000	1400	mg/kg OC	0.026	0.019
DR064	1.3	EPA SI	8/17/1998	Pyrene	0.69	mg/kg dw		2.58	27	1000	1400	mg/kg OC	0.027	0.019
B4b	1.4	LDWRI-Benthic	8/28/2004	Pyrene	0.5	mg/kg dw		2.79	18	1000	1400	mg/kg OC	0.018	0.013
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Pyrene	0.48	mg/kg dw		2.04	24	1000	1400	mg/kg OC	0.024	0.017
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Pyrene	0.66	mg/kg dw		2.11	31	1000	1400	mg/kg OC	0.031	0.022
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Pyrene	0.42	mg/kg dw		2.33	18	1000	1400	mg/kg OC	0.018	0.013
DR091	1.5	EPA SI	8/31/1998	Selenium	8	mg/kg dw	J	0.86						
DR092	1.6	EPA SI	8/27/1998	Selenium	7	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Selenium	8	mg/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Selenium	0.8	mg/kg dw		1.39						
DR025	1.2	EPA SI	8/17/1998	Selenium	7	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Selenium	7	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Selenium	7	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Selenium	10	mg/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Selenium	0.8	mg/kg dw	J	2.79						
DR091	1.5	EPA SI	8/31/1998	Silver	0.17	mg/kg dw		0.86		6.1	6.1	mg/kg dw	0.028	0.028
DR092	1.6	EPA SI	8/27/1998	Silver	0.14	mg/kg dw		0.7		6.1	6.1	mg/kg dw	0.023	0.023
DR144	1.5	EPA SI	8/17/1998	Silver	0.58	mg/kg dw		1.84		6.1	6.1	mg/kg dw	0.095	0.095
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Silver	0.04	mg/kg dw		1.48		6.1	6.1	mg/kg dw	0.0066	0.0066
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Silver	0.02	mg/kg dw		0.34		6.1	6.1	mg/kg dw	0.0033	0.0033
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Silver	0.07	mg/kg dw		0.98		6.1	6.1	mg/kg dw	0.011	0.011

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Silver	0.13	mg/kg dw		2.04		6.1	6.1	mg/kg dw	0.021	0.021
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Silver	0.15	mg/kg dw		1.18		6.1	6.1	mg/kg dw	0.025	0.025
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Silver	0.05	mg/kg dw		0.71		6.1	6.1	mg/kg dw	0.0082	0.0082
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Silver	0.27	mg/kg dw		2.9		6.1	6.1	mg/kg dw	0.044	0.044
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Silver	0.08	mg/kg dw		0.47		6.1	6.1	mg/kg dw	0.013	0.013
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Silver	0.12	mg/kg dw		1.01		6.1	6.1	mg/kg dw	0.02	0.02
B5b	1.5	LDWRI-Benthic	9/28/2004	Silver	0.236	mg/kg dw	J	1.39		6.1	6.1	mg/kg dw	0.039	0.039
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Silver	0.7	mg/kg dw		2.4		6.1	6.1	mg/kg dw	0.11	0.11
DR025	1.2	EPA SI	8/17/1998	Silver	0.45	mg/kg dw		2.83		6.1	6.1	mg/kg dw	0.074	0.074
DR026	1.3	EPA SI	8/17/1998	Silver	0.51	mg/kg dw		3.24		6.1	6.1	mg/kg dw	0.084	0.084
DR027	1.3	EPA SI	8/17/1998	Silver	0.43	mg/kg dw		2.49		6.1	6.1	mg/kg dw	0.07	0.07
DR064	1.3	EPA SI	8/17/1998	Silver	0.42	mg/kg dw		2.58		6.1	6.1	mg/kg dw	0.069	0.069
B4b	1.4	LDWRI-Benthic	8/28/2004	Silver	0.497	mg/kg dw	J	2.79		6.1	6.1	mg/kg dw	0.081	0.081
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Silver	0.6	mg/kg dw		2.04		6.1	6.1	mg/kg dw	0.098	0.098
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Silver	0.6	mg/kg dw	J	2.11		6.1	6.1	mg/kg dw	0.098	0.098
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Silver	0.5	mg/kg dw	J	2.33		6.1	6.1	mg/kg dw	0.082	0.082
B5b	1.5	LDWRI-Benthic	9/28/2004	Tetrabutyltin as ion	0.74	ug/kg dw	J	1.39						
B4b	1.4	LDWRI-Benthic	8/28/2004	Tetrabutyltin as ion	2	ug/kg dw	J	2.79						
DR091	1.5	EPA SI	8/31/1998	Thallium	0.08	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Thallium	0.08	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Thallium	0.11	mg/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Thallium	0.092	mg/kg dw		1.39						
DR025	1.2	EPA SI	8/17/1998	Thallium	0.13	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Thallium	0.14	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Thallium	0.1	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Thallium	0.12	mg/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Thallium	0.151	mg/kg dw		2.79						
DR091	1.5	EPA SI	8/31/1998	Tin	7	mg/kg dw		0.86						
DR144	1.5	EPA SI	8/17/1998	Tin	6	mg/kg dw		1.84						
DR025	1.2	EPA SI	8/17/1998	Tin	5	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Tin	5	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Tin	5	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Tin	5	mg/kg dw		2.58						
DR091	1.5	EPA SI	8/31/1998	Total HPAH (calc'd)	3.5	mg/kg dw		0.86	410	960	5300	mg/kg OC	0.43	0.077
DR092	1.6	EPA SI	8/27/1998	Total HPAH (calc'd)	1.56	mg/kg dw		0.7	220	960	5300	mg/kg OC	0.23	0.042
DR144	1.5	EPA SI	8/17/1998	Total HPAH (calc'd)	3.78	mg/kg dw		1.84	205	960	5300	mg/kg OC	0.21	0.039
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	10	mg/kg dw		1.48	676	960	5300	mg/kg OC	0.7	0.13
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	228	ug/kg dw	J	0.34		12000	17000	ug/kg dw	0.019	0.013
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	2.44	mg/kg dw	J	0.98	250	960	5300	mg/kg OC	0.26	0.047
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	1.22	mg/kg dw	J	2.04	59.8	960	5300	mg/kg OC	0.062	0.011
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	0.91	mg/kg dw	J	1.18	77	960	5300	mg/kg OC	0.08	0.015
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	0.199	mg/kg dw	J	0.71	28	960	5300	mg/kg OC	0.029	0.0053
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	0.56	mg/kg dw	J	2.9	19	960	5300	mg/kg OC	0.02	0.0036
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	920	ug/kg dw	J	0.47		12000	17000	ug/kg dw	0.077	0.054
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Total HPAH (calc'd)	4.66	mg/kg dw		1.01	461	960	5300	mg/kg OC	0.48	0.087
B5b	1.5	LDWRI-Benthic	9/28/2004	Total HPAH (calc'd)	3.44	mg/kg dw		1.39	247	960	5300	mg/kg OC	0.26	0.047
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Total HPAH (calc'd)	1.17	mg/kg dw		2.4	48.8	960	5300	mg/kg OC	0.051	0.0092
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Total HPAH (calc'd)	3.1	mg/kg dw	J	2.02	153	960	5300	mg/kg OC	0.16	0.029
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Total HPAH (calc'd)	0.5	mg/kg dw		1.08	46	960	5300	mg/kg OC	0.048	0.0087
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Total HPAH (calc'd)	3.6	mg/kg dw		1.69	213	960	5300	mg/kg OC	0.22	0.04
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Total HPAH (calc'd)	0.58	mg/kg dw		1.68	35	960	5300	mg/kg OC	0.036	0.0066
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Total HPAH (calc'd)	1.25	mg/kg dw		2.44	51.2	960	5300	mg/kg OC	0.053	0.0097
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Total HPAH (calc'd)	3.01	mg/kg dw		1.75	172	960	5300	mg/kg OC	0.18	0.032
DR025	1.2	EPA SI	8/17/1998	Total HPAH (calc'd)	4.9	mg/kg dw		2.83	170	960	5300	mg/kg OC	0.18	0.032
DR026	1.3	EPA SI	8/17/1998	Total HPAH (calc'd)	3.86	mg/kg dw		3.24	119	960	5300	mg/kg OC	0.12	0.022
DR027	1.3	EPA SI	8/17/1998	Total HPAH (calc'd)	3.84	mg/kg dw		2.49	154	960	5300	mg/kg OC	0.16	0.029

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR064	1.3	EPA SI	8/17/1998	Total HPAH (calc'd)	3.8	mg/kg dw		2.58	147	960	5300	mg/kg OC	0.15	0.028
B4b	1.4	LDWRI-Benthic	8/28/2004	Total HPAH (calc'd)	2.78	mg/kg dw		2.79	99.6	960	5300	mg/kg OC	0.1	0.019
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Total HPAH (calc'd)	2.54	mg/kg dw	J	2.04	125	960	5300	mg/kg OC	0.13	0.024
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Total HPAH (calc'd)	3.95	mg/kg dw		2.11	187	960	5300	mg/kg OC	0.19	0.035
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Total HPAH (calc'd)	2.76	mg/kg dw		2.33	118	960	5300	mg/kg OC	0.12	0.022
DR092	1.6	EPA SI	8/27/1998	Total HpCDD	730	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Total HpCDF	200	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Total HxCDD	68	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Total HxCDF	85	ng/kg dw		0.7						
DR091	1.5	EPA SI	8/31/1998	Total LPAH (calc'd)	0.92	mg/kg dw		0.86	110	370	780	mg/kg OC	0.3	0.14
DR092	1.6	EPA SI	8/27/1998	Total LPAH (calc'd)	0.38	mg/kg dw		0.7	54	370	780	mg/kg OC	0.15	0.069
DR144	1.5	EPA SI	8/17/1998	Total LPAH (calc'd)	0.77	mg/kg dw		1.84	42	370	780	mg/kg OC	0.11	0.054
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.79	mg/kg dw	J	1.48	53	370	780	mg/kg OC	0.14	0.068
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	46	ug/kg dw	J	0.34		5200	13000	ug/kg dw	0.0088	0.0035
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.68	mg/kg dw	J	0.98	69	370	780	mg/kg OC	0.19	0.088
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.33	mg/kg dw	J	2.04	16	370	780	mg/kg OC	0.043	0.021
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.166	mg/kg dw	J	1.18	14.1	370	780	mg/kg OC	0.038	0.018
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.021	mg/kg dw	J	0.71	3	370	780	mg/kg OC	0.0081	0.0038
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.095	mg/kg dw	J	2.9	3.3	370	780	mg/kg OC	0.0089	0.0042
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	226	ug/kg dw	J	0.47		5200	13000	ug/kg dw	0.043	0.017
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Total LPAH (calc'd)	0.54	mg/kg dw	J	1.01	53	370	780	mg/kg OC	0.14	0.068
B5b	1.5	LDWRI-Benthic	9/28/2004	Total LPAH (calc'd)	0.28	mg/kg dw		1.39	20	370	780	mg/kg OC	0.054	0.026
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Total LPAH (calc'd)	0.11	mg/kg dw		2.4	4.58	370	780	mg/kg OC	0.012	0.0059
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Total LPAH (calc'd)	0.32	mg/kg dw		2.02	16	370	780	mg/kg OC	0.043	0.021
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Total LPAH (calc'd)	0.03	mg/kg dw		1.08	2.8	370	780	mg/kg OC	0.0076	0.0036
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Total LPAH (calc'd)	0.33	mg/kg dw		1.69	20	370	780	mg/kg OC	0.054	0.026
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Total LPAH (calc'd)	0.028	mg/kg dw		1.68	1.7	370	780	mg/kg OC	0.0046	0.0022
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Total LPAH (calc'd)	0.118	mg/kg dw		2.44	4.84	370	780	mg/kg OC	0.013	0.0062
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Total LPAH (calc'd)	0.32	mg/kg dw		1.75	18	370	780	mg/kg OC	0.049	0.023
DR025	1.2	EPA SI	8/17/1998	Total LPAH (calc'd)	0.71	mg/kg dw		2.83	25	370	780	mg/kg OC	0.068	0.032
DR026	1.3	EPA SI	8/17/1998	Total LPAH (calc'd)	0.47	mg/kg dw		3.24	15	370	780	mg/kg OC	0.041	0.019
DR027	1.3	EPA SI	8/17/1998	Total LPAH (calc'd)	0.59	mg/kg dw		2.49	24	370	780	mg/kg OC	0.065	0.031
DR064	1.3	EPA SI	8/17/1998	Total LPAH (calc'd)	0.59	mg/kg dw		2.58	23	370	780	mg/kg OC	0.062	0.029
B4b	1.4	LDWRI-Benthic	8/28/2004	Total LPAH (calc'd)	0.33	mg/kg dw		2.79	12	370	780	mg/kg OC	0.032	0.015
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Total LPAH (calc'd)	0.27	mg/kg dw		2.04	13	370	780	mg/kg OC	0.035	0.017
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Total LPAH (calc'd)	0.37	mg/kg dw		2.11	18	370	780	mg/kg OC	0.049	0.023
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Total LPAH (calc'd)	0.26	mg/kg dw		2.33	11	370	780	mg/kg OC	0.03	0.014
DR091	1.5	EPA SI	8/31/1998	Total PAH (calc'd)	4500	ug/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Total PAH (calc'd)	1940	ug/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Total PAH (calc'd)	4550	ug/kg dw		1.84						
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	10800	ug/kg dw	J	1.48						
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	274	ug/kg dw	J	0.34						
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	3120	ug/kg dw	J	0.98						
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	1550	ug/kg dw	J	2.04						
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	1080	ug/kg dw	J	1.18						
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	220	ug/kg dw	J	0.71						
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	660	ug/kg dw	J	2.9						
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	1150	ug/kg dw	J	0.47						
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Total PAH (calc'd)	5190	ug/kg dw	J	1.01						
B5b	1.5	LDWRI-Benthic	9/28/2004	Total PAH (calc'd)	3720	ug/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Total PAH (calc'd)	1280	ug/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Total PAH (calc'd)	3420	ug/kg dw	J	2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Total PAH (calc'd)	530	ug/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Total PAH (calc'd)	3930	ug/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Total PAH (calc'd)	610	ug/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Total PAH (calc'd)	1370	ug/kg dw		2.44						

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Total PAH (calc'd)	3330	ug/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Total PAH (calc'd)	5600	ug/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Total PAH (calc'd)	4330	ug/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Total PAH (calc'd)	4430	ug/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Total PAH (calc'd)	4390	ug/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Total PAH (calc'd)	3100	ug/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Total PAH (calc'd)	2810	ug/kg dw	J	2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Total PAH (calc'd)	4320	ug/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Total PAH (calc'd)	3020	ug/kg dw		2.33						
DR092	1.6	EPA SI	8/27/1998	Total PeCDF	28	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Total TCDD	2.1	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Total TCDF	25	ng/kg dw		0.7						
DR092	1.6	EPA SI	8/27/1998	Tributyltin as ion	25	ug/kg dw	J	0.7						
B5b	1.5	LDWRI-Benthic	9/28/2004	Tributyltin as ion	30	ug/kg dw		1.39						
DR025	1.2	EPA SI	8/17/1998	Tributyltin as ion	130	ug/kg dw		2.83						
B4b	1.4	LDWRI-Benthic	8/28/2004	Tributyltin as ion	96	ug/kg dw		2.79						
DR091	1.5	EPA SI	8/31/1998	Vanadium	44	mg/kg dw		0.86						
DR092	1.6	EPA SI	8/27/1998	Vanadium	43	mg/kg dw		0.7						
DR144	1.5	EPA SI	8/17/1998	Vanadium	51	mg/kg dw		1.84						
B5b	1.5	LDWRI-Benthic	9/28/2004	Vanadium	43.3	mg/kg dw		1.39						
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Vanadium	76.3	mg/kg dw		2.4						
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Vanadium	58.7	mg/kg dw		2.02						
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Vanadium	40.6	mg/kg dw		1.08						
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Vanadium	63.9	mg/kg dw		1.69						
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Vanadium	48.2	mg/kg dw		1.68						
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Vanadium	57	mg/kg dw		2.44						
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Vanadium	38.1	mg/kg dw		1.75						
DR025	1.2	EPA SI	8/17/1998	Vanadium	57	mg/kg dw		2.83						
DR026	1.3	EPA SI	8/17/1998	Vanadium	61	mg/kg dw		3.24						
DR027	1.3	EPA SI	8/17/1998	Vanadium	54	mg/kg dw		2.49						
DR064	1.3	EPA SI	8/17/1998	Vanadium	57	mg/kg dw		2.58						
B4b	1.4	LDWRI-Benthic	8/28/2004	Vanadium	72.5	mg/kg dw		2.79						
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Vanadium	74.2	mg/kg dw		2.04						
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Vanadium	63.7	mg/kg dw		2.11						
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Vanadium	61.9	mg/kg dw		2.33						
DR091	1.5	EPA SI	8/31/1998	Zinc	81	mg/kg dw		0.86		410	960	mg/kg dw	0.2	0.084
DR092	1.6	EPA SI	8/27/1998	Zinc	54	mg/kg dw		0.7		410	960	mg/kg dw	0.13	0.056
DR144	1.5	EPA SI	8/17/1998	Zinc	181	mg/kg dw		1.84		410	960	mg/kg dw	0.44	0.19
JHGSA-SD1-02-0010	1.6	JamesHardieOutfall	7/3/2000	Zinc	64.5	mg/kg dw		1.48		410	960	mg/kg dw	0.16	0.067
JHGSA-SD1-05-0010	1.5	JamesHardieOutfall	7/3/2000	Zinc	19.2	mg/kg dw		0.34		410	960	mg/kg dw	0.047	0.02
JHGSA-SD1-06-0010	1.5	JamesHardieOutfall	7/3/2000	Zinc	25.6	mg/kg dw		0.98		410	960	mg/kg dw	0.062	0.027
JHGSA-SD1-32-0010	1.6	JamesHardieOutfall	7/3/2000	Zinc	1500	mg/kg dw		2.04		410	960	mg/kg dw	3.7	1.6
JHGSA-SD1-COMP10-00	1.5	JamesHardieOutfall	7/3/2000	Zinc	54	mg/kg dw		1.18		410	960	mg/kg dw	0.13	0.056
JHGSA-SD1-COMP16-00	1.5	JamesHardieOutfall	7/3/2000	Zinc	47.1	mg/kg dw		0.71		410	960	mg/kg dw	0.11	0.049
JHGSA-SD1-COMP22-00	1.5	JamesHardieOutfall	7/3/2000	Zinc	62.1	mg/kg dw		2.9		410	960	mg/kg dw	0.15	0.065
JHGSA-SD1-COMP27-00	1.7	JamesHardieOutfall	7/3/2000	Zinc	90.9	mg/kg dw	J	0.47		410	960	mg/kg dw	0.22	0.095
JHGSA-SD1-COMP32-00	1.7	JamesHardieOutfall	7/3/2000	Zinc	213	mg/kg dw		1.01		410	960	mg/kg dw	0.52	0.22
B5b	1.5	LDWRI-Benthic	9/28/2004	Zinc	93.9	mg/kg dw		1.39		410	960	mg/kg dw	0.23	0.098
LDW-SS52	1.4	LDWRI-SurfaceSedimentRound1	1/25/2005	Zinc	167	mg/kg dw		2.4		410	960	mg/kg dw	0.41	0.17
LDW-SS54	1.4	LDWRI-SurfaceSedimentRound1	1/24/2005	Zinc	112	mg/kg dw		2.02		410	960	mg/kg dw	0.27	0.12
LDW-SS60	1.6	LDWRI-SurfaceSedimentRound1	1/19/2005	Zinc	38	mg/kg dw		1.08		410	960	mg/kg dw	0.093	0.04
LDW-SS64	1.6	LDWRI-SurfaceSedimentRound1	1/24/2005	Zinc	195	mg/kg dw		1.69		410	960	mg/kg dw	0.48	0.2
LDW-SS61	1.6	LDWRI-SurfaceSedimentRound2	3/10/2005	Zinc	70.4	mg/kg dw		1.68		410	960	mg/kg dw	0.17	0.073
LDW-SS65	1.7	LDWRI-SurfaceSedimentRound2	3/8/2005	Zinc	101	mg/kg dw		2.44		410	960	mg/kg dw	0.25	0.11
LDW-SSB5b	1.5	LDWRI-SurfaceSedimentRound2	3/14/2005	Zinc	63.3	mg/kg dw	J	1.75		410	960	mg/kg dw	0.15	0.066
DR025	1.2	EPA SI	8/17/1998	Zinc	138	mg/kg dw		2.83		410	960	mg/kg dw	0.34	0.14

Table A-1
Contaminants Detected in Surface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sampling Event	Sample Collection Date	Contaminant	Concentration Value	Concentration Units	TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
DR026	1.3	EPA SI	8/17/1998	Zinc	142	mg/kg dw	3.24		410	960	mg/kg dw	0.35	0.15
DR027	1.3	EPA SI	8/17/1998	Zinc	127	mg/kg dw	2.49		410	960	mg/kg dw	0.31	0.13
DR064	1.3	EPA SI	8/17/1998	Zinc	129	mg/kg dw	2.58		410	960	mg/kg dw	0.31	0.13
B4b	1.4	LDWRI-Benthic	8/28/2004	Zinc	155	mg/kg dw	2.79		410	960	mg/kg dw	0.38	0.16
LDW-SS42	1.2	LDWRI-SurfaceSedimentRound1	1/24/2005	Zinc	157	mg/kg dw	2.04		410	960	mg/kg dw	0.38	0.16
LDW-SS325	1.3	LDWRI-SurfaceSedimentRound3	10/4/2006	Zinc	170	mg/kg dw	2.11		410	960	mg/kg dw	0.41	0.18
LDW-SS326	1.4	LDWRI-SurfaceSedimentRound3	10/4/2006	Zinc	138	mg/kg dw	2.33		410	960	mg/kg dw	0.34	0.14

Key:
DW - Dry weight
CSL - Cleanup Screening Level
OC - Organic carbon
TOC - Total organic carbon
SQS - Sediment Quality Standard

Notes:
1. SQS and CSL values are substituted with AET values for dry weight comparison where organic compounds are not OC-normalized (when TOC % DW is outside of the 0.5-4.0% range).
2. Exceedance factors are the ratio of the detected concentration to the CSL or SQS (or to AET values where applicable); chemicals with one or more exceedance factors greater than 1 are highlighted.

Source:
Lower Duwamish Waterway Group, 2007. Online Lower Duwamish Waterway Group Draft Remedial Investigation Report (November 2007) Database. http://www.ldwg.org.

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	1,2,4-Trichlorobenzene	0.0059	mg/kg dw		2.24	0.26	0.81	1.8	mg/kg OC	0.32	0.14
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	1,2-Dichlorobenzene	0.0042	mg/kg dw	J	2.24	0.19	2.3	2.3	mg/kg OC	0.083	0.083
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	1,4-Dichlorobenzene	0.0035	mg/kg dw	J	2.52	0.14	3.1	9	mg/kg OC	0.045	0.016
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	1,4-Dichlorobenzene	0.0037	mg/kg dw	J	2.05	0.18	3.1	9	mg/kg OC	0.058	0.02
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	1,4-Dichlorobenzene	0.004	mg/kg dw	J	1.46	0.27	3.1	9	mg/kg OC	0.087	0.03
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	1,4-Dichlorobenzene	0.0042	mg/kg dw	J	2.24	0.19	3.1	9	mg/kg OC	0.061	0.021
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	1-Methylnaphthalene	70	ug/kg dw		1.78						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	1-Methylnaphthalene	150	ug/kg dw		2.29						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	1-Methylnaphthalene	170	ug/kg dw		1.3						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	2,4-Dimethylphenol	9.9	ug/kg dw	J	1.3		29	29	ug/kg dw	0.34	0.34
C	1.7	0 to 3	Hardie Gypsum-2	1999	2-Methylnaphthalene	0.16	mg/kg dw		1.9	8.4	38	64	mg/kg OC	0.22	0.13
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	2-Methylnaphthalene	0.089	mg/kg dw		1.78	5	38	64	mg/kg OC	0.13	0.078
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	2-Methylnaphthalene	0.12	mg/kg dw		1.3	9.2	38	64	mg/kg OC	0.24	0.14
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	2-Methylphenol	6.2	ug/kg dw		2.17		63	63	ug/kg dw	0.098	0.098
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	2-Methylphenol	6.1	ug/kg dw		2.05		63	63	ug/kg dw	0.097	0.097
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	2-Methylphenol	7.1	ug/kg dw		2.12		63	63	ug/kg dw	0.11	0.11
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	2-Methylphenol	9.3	ug/kg dw		1.6		63	63	ug/kg dw	0.15	0.15
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	2-Methylphenol	8.6	ug/kg dw	J	1.78		63	63	ug/kg dw	0.14	0.14
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	2-Methylphenol	10	ug/kg dw		2.14		63	63	ug/kg dw	0.16	0.16
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	2-Methylphenol	6.1	ug/kg dw	J	2.29		63	63	ug/kg dw	0.097	0.097
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	2-Methylphenol	8.7	ug/kg dw	J	1.3		63	63	ug/kg dw	0.14	0.14
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	2-Methylphenol	3.6	ug/kg dw	J	2.24		63	63	ug/kg dw	0.057	0.057
2	3.7	0 to 2	PSDDA98	1998	4,4'-DDD	1.1	ug/kg dw	J	2.1						
3	3.9	0 to 2	PSDDA98	1998	4,4'-DDD	1.4	ug/kg dw	J	2.2						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	4,4'-DDE	3.9	ug/kg dw		1.8						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	4,4'-DDE	1.6	ug/kg dw		0.7						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Acenaphthene	0.032	mg/kg dw		2.2	1.5	16	57	mg/kg OC	0.094	0.026
B	1.6	0 to 3	Hardie Gypsum-2	1999	Acenaphthene	0.27	mg/kg dw		1.9	14	16	57	mg/kg OC	0.88	0.25
C	1.7	0 to 3	Hardie Gypsum-2	1999	Acenaphthene	0.23	mg/kg dw		1.9	12	16	57	mg/kg OC	0.75	0.21
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.048	mg/kg dw	J	1.6	3	16	57	mg/kg OC	0.19	0.053
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.04	mg/kg dw	J	1.76	2.3	16	57	mg/kg OC	0.14	0.04
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.57	mg/kg dw		1.39	41	16	57	mg/kg OC	2.6	0.72
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.15	mg/kg dw		1.78	8.4	16	57	mg/kg OC	0.53	0.15
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthene	0.34	mg/kg dw		2.14	16	16	57	mg/kg OC	1	0.28
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthene	1.5	mg/kg dw		2.29	66	16	57	mg/kg OC	4.1	1.2
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthene	2.1	mg/kg dw		1.3	160	16	57	mg/kg OC	10	2.8
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Acenaphthylene	0.033	mg/kg dw	J	2.05	1.6	66	66	mg/kg OC	0.024	0.024
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Acenaphthylene	0.041	mg/kg dw	J	1.78	2.3	66	66	mg/kg OC	0.035	0.035
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthylene	0.095	mg/kg dw		2.14	4.4	66	66	mg/kg OC	0.067	0.067
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthylene	0.076	mg/kg dw		2.29	3.3	66	66	mg/kg OC	0.05	0.05
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Acenaphthylene	0.13	mg/kg dw		1.3	10	66	66	mg/kg OC	0.15	0.15
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Anthracene	0.044	mg/kg dw		1.8	2.4	220	1200	mg/kg OC	0.011	0.002
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Anthracene	0.073	mg/kg dw		2.2	3.3	220	1200	mg/kg OC	0.015	0.0027
1	1.6	0 to 4	Hardie Gypsum-1	1998	Anthracene	0.029	mg/kg dw		1.3	2.2	220	1200	mg/kg OC	0.01	0.0018
2	1.6	0 to 4	Hardie Gypsum-1	1998	Anthracene	0.041	mg/kg dw		2.3	1.8	220	1200	mg/kg OC	0.0082	0.0015
3	1.7	0 to 4	Hardie Gypsum-1	1998	Anthracene	0.032	mg/kg dw		2.1	1.5	220	1200	mg/kg OC	0.0068	0.0013
B	1.6	0 to 3	Hardie Gypsum-2	1999	Anthracene	0.16	mg/kg dw		1.9	8.4	220	1200	mg/kg OC	0.038	0.007
C	1.7	0 to 3	Hardie Gypsum-2	1999	Anthracene	0.2	mg/kg dw		1.9	11	220	1200	mg/kg OC	0.05	0.0092
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Anthracene	0.058	mg/kg dw		1.9	3.1	220	1200	mg/kg OC	0.014	0.0026
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Anthracene	0.071	mg/kg dw		2.52	2.8	220	1200	mg/kg OC	0.013	0.0023
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Anthracene	0.048	mg/kg dw	J	2.18	2.2	220	1200	mg/kg OC	0.01	0.0018
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Anthracene	0.086	mg/kg dw		2.17	4	220	1200	mg/kg OC	0.018	0.0033
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Anthracene	0.14	mg/kg dw		2.05	6.8	220	1200	mg/kg OC	0.031	0.0057
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Anthracene	0.066	mg/kg dw		2.12	3.1	220	1200	mg/kg OC	0.014	0.0026
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Anthracene	0.087	mg/kg dw		1.6	5.4	220	1200	mg/kg OC	0.025	0.0045

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Anthracene	0.12	mg/kg dw		1.76	6.8	220	1200	mg/kg OC	0.031	0.0057
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Anthracene	0.17	mg/kg dw		1.39	12	220	1200	mg/kg OC	0.055	0.01
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Anthracene	0.48	mg/kg dw		1.78	27	220	1200	mg/kg OC	0.12	0.023
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Anthracene	1.6	mg/kg dw		2.14	75	220	1200	mg/kg OC	0.34	0.063
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Anthracene	1.1	mg/kg dw		2.29	48	220	1200	mg/kg OC	0.22	0.04
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Anthracene	8.8	mg/kg dw		1.3	680	220	1200	mg/kg OC	3.1	0.57
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Anthracene	0.053	mg/kg dw	J	1.46	3.6	220	1200	mg/kg OC	0.016	0.003
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Anthracene	0.068	mg/kg dw		2.24	3	220	1200	mg/kg OC	0.014	0.0025
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Anthracene	0.034	mg/kg dw		2.12	1.6	220	1200	mg/kg OC	0.0073	0.0013
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Antimony	5.4	mg/kg dw		1.8						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Antimony	20	mg/kg dw		2.2						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Antimony	1.7	mg/kg dw		0.7						
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Antimony	0.56	mg/kg dw		0.23						
2	1.6	0 to 4	Hardie Gypsum-1	1998	Antimony	2.5	mg/kg dw		2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Antimony	1.2	mg/kg dw		2.1						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Antimony	0.9	mg/kg dw		2.1						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Antimony	0.8	mg/kg dw		1.9						
3	3.9	0 to 2	PSDDA98	1998	Antimony	8	mg/kg dw		2.2						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Arsenic	16	mg/kg dw		1.8		57	93	mg/kg dw	0.28	0.17
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Arsenic	49	mg/kg dw		2.2		57	93	mg/kg dw	0.86	0.53
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Arsenic	5.7	mg/kg dw		0.7		57	93	mg/kg dw	0.1	0.061
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Arsenic	2.2	mg/kg dw		0.23		57	93	mg/kg dw	0.039	0.024
1	1.6	0 to 4	Hardie Gypsum-1	1998	Arsenic	6.9	mg/kg dw		1.3		57	93	mg/kg dw	0.12	0.074
2	1.6	0 to 4	Hardie Gypsum-1	1998	Arsenic	20	mg/kg dw		2.3		57	93	mg/kg dw	0.35	0.22
3	1.7	0 to 4	Hardie Gypsum-1	1998	Arsenic	13	mg/kg dw		2.1		57	93	mg/kg dw	0.23	0.14
A	1.6	0 to 3	Hardie Gypsum-2	1999	Arsenic	17	mg/kg dw		2.1		57	93	mg/kg dw	0.3	0.18
B	1.6	0 to 3	Hardie Gypsum-2	1999	Arsenic	12	mg/kg dw		1.9		57	93	mg/kg dw	0.21	0.13
C	1.7	0 to 3	Hardie Gypsum-2	1999	Arsenic	15	mg/kg dw		1.9		57	93	mg/kg dw	0.26	0.16
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Arsenic	23	mg/kg dw		1.9		57	93	mg/kg dw	0.4	0.25
3	1.7	0 to 3	Hardie Gypsum-2	1999	Arsenic	14	mg/kg dw		1.5		57	93	mg/kg dw	0.25	0.15
1	3.5	0 to 2	PSDDA98	1998	Arsenic	9	mg/kg dw		1.9		57	93	mg/kg dw	0.16	0.097
2	3.7	0 to 2	PSDDA98	1998	Arsenic	11	mg/kg dw		2.1		57	93	mg/kg dw	0.19	0.12
3	3.9	0 to 2	PSDDA98	1998	Arsenic	10	mg/kg dw		2.2		57	93	mg/kg dw	0.18	0.11
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Arsenic	20	mg/kg dw		2.52		57	93	mg/kg dw	0.35	0.22
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Arsenic	17	mg/kg dw		2.18		57	93	mg/kg dw	0.3	0.18
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Arsenic	18	mg/kg dw		2.12		57	93	mg/kg dw	0.32	0.19
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Arsenic	20	mg/kg dw		2.14		57	93	mg/kg dw	0.35	0.22
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Arsenic	19	mg/kg dw		2.24		57	93	mg/kg dw	0.33	0.2
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Arsenic	17	mg/kg dw		2.12		57	93	mg/kg dw	0.3	0.18
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(a)anthracene	0.18	mg/kg dw		1.8	10	110	270	mg/kg OC	0.091	0.037
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(a)anthracene	0.28	ug/kg dw		2.2	13	110	270	mg/kg OC	0.12	0.048
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzo(a)anthracene	0.038	ug/kg dw		0.7	5.4	110	270	mg/kg OC	0.049	0.02
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(a)anthracene	0.11	ug/kg dw		1.3	8.5	110	270	mg/kg OC	0.077	0.031
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(a)anthracene	0.17	ug/kg dw		2.3	7.4	110	270	mg/kg OC	0.067	0.027
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzo(a)anthracene	0.16	ug/kg dw		2.1	7.6	110	270	mg/kg OC	0.069	0.028
A	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)anthracene	0.11	ug/kg dw		2.1	5.2	110	270	mg/kg OC	0.047	0.019
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)anthracene	0.31	ug/kg dw		1.9	16	110	270	mg/kg OC	0.15	0.059
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(a)anthracene	0.54	ug/kg dw		1.9	28	110	270	mg/kg OC	0.25	0.1
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)anthracene	0.19	ug/kg dw		1.9	10	110	270	mg/kg OC	0.091	0.037
3	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(a)anthracene	0.094	ug/kg dw		1.5	6.3	110	270	mg/kg OC	0.057	0.023
1	3.5	0 to 2	PSDDA98	1998	Benzo(a)anthracene	0.061	ug/kg dw		1.9	3.2	110	270	mg/kg OC	0.029	0.012
2	3.7	0 to 2	PSDDA98	1998	Benzo(a)anthracene	0.083	ug/kg dw		2.1	4	110	270	mg/kg OC	0.036	0.015
3	3.9	0 to 2	PSDDA98	1998	Benzo(a)anthracene	0.063	ug/kg dw		2.2	2.9	110	270	mg/kg OC	0.026	0.011
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.017	ug/kg dw	J	0.541	3.1	110	270	mg/kg OC	0.028	0.011
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.24	ug/kg dw		2.52	9.5	110	270	mg/kg OC	0.086	0.035

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.15	ug/kg dw		2.18	6.9	110	270	mg/kg OC	0.063	0.026
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.28	mg/kg dw		2.17	13	110	270	mg/kg OC	0.12	0.048
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.44	mg/kg dw		2.05	21	110	270	mg/kg OC	0.19	0.078
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.19	mg/kg dw		2.12	9	110	270	mg/kg OC	0.082	0.033
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.34	mg/kg dw		1.6	21	110	270	mg/kg OC	0.19	0.078
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.31	mg/kg dw		1.76	18	110	270	mg/kg OC	0.16	0.067
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.22	mg/kg dw		1.39	16	110	270	mg/kg OC	0.15	0.059
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	1.1	mg/kg dw		1.78	62	110	270	mg/kg OC	0.56	0.23
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	3.2	mg/kg dw		2.14	150	110	270	mg/kg OC	1.4	0.56
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	2.7	mg/kg dw		2.29	120	110	270	mg/kg OC	1.1	0.44
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	7.1	mg/kg dw		1.3	550	110	270	mg/kg OC	5	2
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.18	mg/kg dw		1.46	12	110	270	mg/kg OC	0.11	0.044
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.15	mg/kg dw		2.24	6.7	110	270	mg/kg OC	0.061	0.025
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)anthracene	0.054	mg/kg dw		2.12	2.5	110	270	mg/kg OC	0.023	0.0093
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(a)pyrene	0.22	ug/kg dw		1.8	12	99	210	mg/kg OC	0.12	0.057
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(a)pyrene	0.3	ug/kg dw		2.2	14	99	210	mg/kg OC	0.14	0.067
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzo(a)pyrene	0.058	ug/kg dw		0.7	8.3	99	210	mg/kg OC	0.084	0.04
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(a)pyrene	0.09	ug/kg dw		1.3	6.9	99	210	mg/kg OC	0.07	0.033
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(a)pyrene	0.15	ug/kg dw		2.3	6.5	99	210	mg/kg OC	0.066	0.031
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzo(a)pyrene	0.12	ug/kg dw		2.1	5.7	99	210	mg/kg OC	0.058	0.027
A	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)pyrene	0.11	ug/kg dw		2.1	5.2	99	210	mg/kg OC	0.053	0.025
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)pyrene	0.2	ug/kg dw		1.9	11	99	210	mg/kg OC	0.11	0.052
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(a)pyrene	0.46	ug/kg dw		1.9	24	99	210	mg/kg OC	0.24	0.11
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(a)pyrene	0.16	ug/kg dw		1.9	8.4	99	210	mg/kg OC	0.085	0.04
3	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(a)pyrene	0.096	ug/kg dw		1.5	6.4	99	210	mg/kg OC	0.065	0.03
2	3.7	0 to 2	PSDDA98	1998	Benzo(a)pyrene	0.094	ug/kg dw		2.1	4.5	99	210	mg/kg OC	0.045	0.021
3	3.9	0 to 2	PSDDA98	1998	Benzo(a)pyrene	0.14	ug/kg dw		2.2	6.4	99	210	mg/kg OC	0.065	0.03
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.018	ug/kg dw	J	0.541	3.3	99	210	mg/kg OC	0.033	0.016
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.22	ug/kg dw		2.52	8.7	99	210	mg/kg OC	0.088	0.041
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.2	ug/kg dw		2.18	9.2	99	210	mg/kg OC	0.093	0.044
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.32	mg/kg dw		2.17	15	99	210	mg/kg OC	0.15	0.071
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.4	mg/kg dw		2.05	20	99	210	mg/kg OC	0.2	0.095
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.23	mg/kg dw		2.12	11	99	210	mg/kg OC	0.11	0.052
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.36	mg/kg dw		1.6	23	99	210	mg/kg OC	0.23	0.11
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.41	mg/kg dw		1.76	23	99	210	mg/kg OC	0.23	0.11
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.11	mg/kg dw		1.39	7.9	99	210	mg/kg OC	0.08	0.038
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.82	mg/kg dw		1.78	46	99	210	mg/kg OC	0.46	0.22
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	2.5	mg/kg dw		2.14	120	99	210	mg/kg OC	1.2	0.57
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	1.2	mg/kg dw		2.29	52	99	210	mg/kg OC	0.53	0.25
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	3	mg/kg dw		1.3	230	99	210	mg/kg OC	2.3	1.1
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.2	mg/kg dw		1.46	14	99	210	mg/kg OC	0.14	0.067
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.23	mg/kg dw		2.24	10	99	210	mg/kg OC	0.1	0.048
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(a)pyrene	0.083	mg/kg dw		2.12	3.9	99	210	mg/kg OC	0.039	0.019
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(b)fluoranthene	290	ug/kg dw		1.8						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(b)fluoranthene	450	ug/kg dw		2.2						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzo(b)fluoranthene	72	ug/kg dw		0.7						
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(b)fluoranthene	120	ug/kg dw		1.3						
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(b)fluoranthene	170	ug/kg dw		2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzo(b)fluoranthene	160	ug/kg dw		2.1						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(b)fluoranthene	130	ug/kg dw		2.1						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(b)fluoranthene	260	ug/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(b)fluoranthene	730	ug/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(b)fluoranthene	190	ug/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(b)fluoranthene	110	ug/kg dw		1.5						
1	3.5	0 to 2	PSDDA98	1998	Benzo(b)fluoranthene	53	ug/kg dw		1.9						

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
2	3.7	0 to 2	PSDDA98	1998	Benzo(b)fluoranthene	110	ug/kg dw		2.1						
3	3.9	0 to 2	PSDDA98	1998	Benzo(b)fluoranthene	100	ug/kg dw		2.2						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	32	ug/kg dw		0.541						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	290	ug/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	320	ug/kg dw		2.18						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	530	ug/kg dw		2.17						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	600	ug/kg dw		2.05						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	350	ug/kg dw		2.12						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	400	ug/kg dw		1.6						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	540	ug/kg dw		1.76						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	140	ug/kg dw		1.39						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	800	ug/kg dw		1.78						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	3800	ug/kg dw		2.14						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	1900	ug/kg dw		2.29						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	3900	ug/kg dw		1.3						
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	300	ug/kg dw		1.46						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	350	ug/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(b)fluoranthene	110	ug/kg dw		2.12						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(g,h,i)perylene	0.11	mg/kg dw		1.8	6.1	31	78	mg/kg OC	0.2	0.078
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(g,h,i)perylene	0.13	mg/kg dw		2.2	5.9	31	78	mg/kg OC	0.19	0.076
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzo(g,h,i)perylene	0.034	mg/kg dw		0.7	4.9	31	78	mg/kg OC	0.16	0.063
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(g,h,i)perylene	0.062	mg/kg dw		1.3	4.8	31	78	mg/kg OC	0.15	0.062
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(g,h,i)perylene	0.1	mg/kg dw		2.3	4.3	31	78	mg/kg OC	0.14	0.055
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzo(g,h,i)perylene	0.078	mg/kg dw		2.1	3.7	31	78	mg/kg OC	0.12	0.047
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(g,h,i)perylene	0.085	mg/kg dw		1.9	4.5	31	78	mg/kg OC	0.15	0.058
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(g,h,i)perylene	0.19	mg/kg dw		1.9	10	31	78	mg/kg OC	0.32	0.13
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(g,h,i)perylene	0.076	mg/kg dw		1.9	4	31	78	mg/kg OC	0.13	0.051
2	3.7	0 to 2	PSDDA98	1998	Benzo(g,h,i)perylene	0.077	mg/kg dw		2.1	3.7	31	78	mg/kg OC	0.12	0.047
3	3.9	0 to 2	PSDDA98	1998	Benzo(g,h,i)perylene	0.063	mg/kg dw		2.2	2.9	31	78	mg/kg OC	0.094	0.037
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.079	mg/kg dw		2.52	3.1	31	78	mg/kg OC	0.1	0.04
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.05	mg/kg dw	J	2.18	2.3	31	78	mg/kg OC	0.074	0.029
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.18	mg/kg dw		2.17	8.3	31	78	mg/kg OC	0.27	0.11
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.22	mg/kg dw		2.05	11	31	78	mg/kg OC	0.35	0.14
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.044	mg/kg dw	J	2.12	2.1	31	78	mg/kg OC	0.068	0.027
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.19	mg/kg dw		1.6	12	31	78	mg/kg OC	0.39	0.15
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.2	mg/kg dw		1.76	11	31	78	mg/kg OC	0.35	0.14
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.046	mg/kg dw	J	1.39	3.3	31	78	mg/kg OC	0.11	0.042
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.42	mg/kg dw		1.78	24	31	78	mg/kg OC	0.77	0.31
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.49	mg/kg dw		2.14	23	31	78	mg/kg OC	0.74	0.29
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.27	mg/kg dw		2.29	12	31	78	mg/kg OC	0.39	0.15
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.73	mg/kg dw		1.3	56	31	78	mg/kg OC	1.8	0.72
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.1	mg/kg dw		1.46	6.8	31	78	mg/kg OC	0.22	0.087
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.063	mg/kg dw		2.24	2.8	31	78	mg/kg OC	0.09	0.036
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(g,h,i)perylene	0.024	mg/kg dw		2.12	1.1	31	78	mg/kg OC	0.035	0.014
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(k)fluoranthene	170	ug/kg dw		1.8						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzo(k)fluoranthene	230	ug/kg dw		2.2						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzo(k)fluoranthene	50	ug/kg dw		0.7						
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(k)fluoranthene	100	ug/kg dw		1.3						
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzo(k)fluoranthene	140	ug/kg dw		2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzo(k)fluoranthene	120	ug/kg dw		2.1						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(k)fluoranthene	120	ug/kg dw		2.1						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(k)fluoranthene	240	ug/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(k)fluoranthene	650	ug/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzo(k)fluoranthene	200	ug/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Benzo(k)fluoranthene	100	ug/kg dw		1.5						

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
1	3.5	0 to 2	PSDDA98	1998	Benzo(k)fluoranthene	59	ug/kg dw		1.9						
2	3.7	0 to 2	PSDDA98	1998	Benzo(k)fluoranthene	120	ug/kg dw		2.1						
3	3.9	0 to 2	PSDDA98	1998	Benzo(k)fluoranthene	84	ug/kg dw		2.2						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	23	ug/kg dw		0.541						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	280	ug/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	270	ug/kg dw		2.18						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	270	ug/kg dw		2.17						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	400	ug/kg dw		2.05						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	320	ug/kg dw		2.12						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	370	ug/kg dw		1.6						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	390	ug/kg dw		1.76						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	120	ug/kg dw		1.39						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	730	ug/kg dw		1.78						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	2200	ug/kg dw		2.14						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	1200	ug/kg dw		2.29						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	2500	ug/kg dw		1.3						
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	180	ug/kg dw		1.46						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	260	ug/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzo(k)fluoranthene	82	ug/kg dw		2.12						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Benzofluoranthenes (total-calc'd)	0.46	mg/kg dw		1.8	26	230	450	mg/kg OC	0.11	0.058
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Benzofluoranthenes (total-calc'd)	0.68	mg/kg dw		2.2	31	230	450	mg/kg OC	0.13	0.069
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Benzofluoranthenes (total-calc'd)	0.122	mg/kg dw		0.7	17	230	450	mg/kg OC	0.074	0.038
1	1.6	0 to 4	Hardie Gypsum-1	1998	Benzofluoranthenes (total-calc'd)	0.22	mg/kg dw		1.3	17	230	450	mg/kg OC	0.074	0.038
2	1.6	0 to 4	Hardie Gypsum-1	1998	Benzofluoranthenes (total-calc'd)	0.31	mg/kg dw		2.3	13	230	450	mg/kg OC	0.057	0.029
3	1.7	0 to 4	Hardie Gypsum-1	1998	Benzofluoranthenes (total-calc'd)	0.28	mg/kg dw		2.1	13	230	450	mg/kg OC	0.057	0.029
A	1.6	0 to 3	Hardie Gypsum-2	1999	Benzofluoranthenes (total-calc'd)	0.25	mg/kg dw		2.1	12	230	450	mg/kg OC	0.052	0.027
B	1.6	0 to 3	Hardie Gypsum-2	1999	Benzofluoranthenes (total-calc'd)	0.5	mg/kg dw		1.9	26	230	450	mg/kg OC	0.11	0.058
C	1.7	0 to 3	Hardie Gypsum-2	1999	Benzofluoranthenes (total-calc'd)	1.38	mg/kg dw		1.9	73	230	450	mg/kg OC	0.32	0.16
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzofluoranthenes (total-calc'd)	0.39	mg/kg dw		1.9	21	230	450	mg/kg OC	0.091	0.047
3	1.7	0 to 3	Hardie Gypsum-2	1999	Benzofluoranthenes (total-calc'd)	0.21	mg/kg dw		1.5	14	230	450	mg/kg OC	0.061	0.031
1	3.5	0 to 2	PSDDA98	1998	Benzofluoranthenes (total-calc'd)	0.112	mg/kg dw		1.9	5.9	230	450	mg/kg OC	0.026	0.013
2	3.7	0 to 2	PSDDA98	1998	Benzofluoranthenes (total-calc'd)	0.23	mg/kg dw		2.1	11	230	450	mg/kg OC	0.048	0.024
3	3.9	0 to 2	PSDDA98	1998	Benzofluoranthenes (total-calc'd)	0.2	mg/kg dw		2.2	9	230	450	mg/kg OC	0.039	0.02
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.055	mg/kg dw		0.541	10	230	450	mg/kg OC	0.043	0.022
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.57	mg/kg dw		2.52	23	230	450	mg/kg OC	0.1	0.051
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.59	mg/kg dw		2.18	27	230	450	mg/kg OC	0.12	0.06
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.8	mg/kg dw		2.17	37	230	450	mg/kg OC	0.16	0.082
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	1	mg/kg dw		2.05	49	230	450	mg/kg OC	0.21	0.11
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.67	mg/kg dw		2.12	32	230	450	mg/kg OC	0.14	0.071
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.77	mg/kg dw		1.6	48	230	450	mg/kg OC	0.21	0.11
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.93	mg/kg dw		1.76	53	230	450	mg/kg OC	0.23	0.12
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.26	mg/kg dw		1.39	19	230	450	mg/kg OC	0.083	0.042
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	1.53	mg/kg dw		1.78	86	230	450	mg/kg OC	0.37	0.19
LDW-SC23	**1.2**	**2 to 4**	**LDW Subsurface Sediment 2006**	**2006**	**Benzofluoranthenes (total-calc'd)**	**6**	**mg/kg dw**		**2.14**	**280**	**230**	**450**	**mg/kg OC**	**1.2**	**0.62**
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	3.1	mg/kg dw		2.29	140	230	450	mg/kg OC	0.61	0.31
LDW-SC23	**1.2**	**3 to 4**	**LDW Subsurface Sediment 2006**	**2006**	**Benzofluoranthenes (total-calc'd)**	**6.4**	**mg/kg dw**		**1.3**	**490**	**230**	**450**	**mg/kg OC**	**2.1**	**1.1**
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.48	mg/kg dw		1.46	33	230	450	mg/kg OC	0.14	0.073
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.61	mg/kg dw		2.24	27	230	450	mg/kg OC	0.12	0.06
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Benzofluoranthenes (total-calc'd)	0.19	mg/kg dw		2.12	9	230	450	mg/kg OC	0.039	0.02
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzoic acid	280	ug/kg dw		1.9		650	650	ug/kg dw	0.43	0.43
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Benzoic acid	170	ug/kg dw	J	2.52		650	650	ug/kg dw	0.26	0.26
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Benzoic acid	120	ug/kg dw	J	2.18		650	650	ug/kg dw	0.18	0.18
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Benzoic acid	57	ug/kg dw	J	0.11		650	650	ug/kg dw	0.088	0.088
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Benzoic acid	250	ug/kg dw		2.12		650	650	ug/kg dw	0.38	0.38
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Benzoic acid	240	ug/kg dw		2.14		650	650	ug/kg dw	0.37	0.37

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentratio n (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Benzyl alcohol	56	ug/kg dw		1.9		57	73	ug/kg dw	0.98	0.77
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Benzyl alcohol	20	ug/kg dw	J	2.24		57	73	ug/kg dw	0.35	0.27
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Bis(2-ethylhexyl)phthalate	0.24	mg/kg dw		1.8	13	47	78	mg/kg OC	0.28	0.17
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Bis(2-ethylhexyl)phthalate	0.34	mg/kg dw		2.2	15	47	78	mg/kg OC	0.32	0.19
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Bis(2-ethylhexyl)phthalate	0.098	mg/kg dw		0.7	14	47	78	mg/kg OC	0.3	0.18
2	1.6	0 to 4	Hardie Gypsum-1	1998	Bis(2-ethylhexyl)phthalate	0.5	mg/kg dw		2.3	22	47	78	mg/kg OC	0.47	0.28
3	1.7	0 to 4	Hardie Gypsum-1	1998	Bis(2-ethylhexyl)phthalate	0.26	mg/kg dw		2.1	12	47	78	mg/kg OC	0.26	0.15
A	1.6	0 to 3	Hardie Gypsum-2	1999	Bis(2-ethylhexyl)phthalate	0.38	mg/kg dw		2.1	18	47	78	mg/kg OC	0.38	0.23
B	1.6	0 to 3	Hardie Gypsum-2	1999	Bis(2-ethylhexyl)phthalate	0.54	mg/kg dw		1.9	28	47	78	mg/kg OC	0.6	0.36
C	1.7	0 to 3	Hardie Gypsum-2	1999	Bis(2-ethylhexyl)phthalate	0.47	mg/kg dw		1.9	25	47	78	mg/kg OC	0.53	0.32
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Bis(2-ethylhexyl)phthalate	0.45	mg/kg dw		1.9	24	47	78	mg/kg OC	0.51	0.31
3	1.7	0 to 3	Hardie Gypsum-2	1999	Bis(2-ethylhexyl)phthalate	0.2	mg/kg dw		1.5	13	47	78	mg/kg OC	0.28	0.17
1	3.5	0 to 2	PSDDA98	1998	Bis(2-ethylhexyl)phthalate	0.18	mg/kg dw		1.9	9.5	47	78	mg/kg OC	0.2	0.12
2	3.7	0 to 2	PSDDA98	1998	Bis(2-ethylhexyl)phthalate	0.3	mg/kg dw		2.1	10	47	78	mg/kg OC	0.21	0.13
3	3.9	0 to 2	PSDDA98	1998	Bis(2-ethylhexyl)phthalate	0.23	mg/kg dw		2.2	10	47	78	mg/kg OC	0.21	0.13
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.03	mg/kg dw		0.541	5.5	47	78	mg/kg OC	0.12	0.071
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.27	mg/kg dw		2.52	11	47	78	mg/kg OC	0.23	0.14
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.26	mg/kg dw		2.18	12	47	78	mg/kg OC	0.26	0.15
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.42	mg/kg dw		2.17	19	47	78	mg/kg OC	0.4	0.24
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.34	mg/kg dw		2.05	17	47	78	mg/kg OC	0.36	0.22
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.18	mg/kg dw		2.12	8.5	47	78	mg/kg OC	0.18	0.11
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw		1.6	6.9	47	78	mg/kg OC	0.15	0.088
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.32	mg/kg dw		1.76	18	47	78	mg/kg OC	0.38	0.23
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.068	mg/kg dw		1.39	4.9	47	78	mg/kg OC	0.1	0.063
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.11	mg/kg dw		1.78	6.2	47	78	mg/kg OC	0.13	0.079
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	1.6	mg/kg dw		2.14	75	47	78	mg/kg OC	1.6	0.96
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.38	mg/kg dw		2.29	17	47	78	mg/kg OC	0.36	0.22
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.78	mg/kg dw		1.3	60	47	78	mg/kg OC	1.3	0.77
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.39	mg/kg dw		1.46	27	47	78	mg/kg OC	0.57	0.35
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.91	mg/kg dw		2.24	41	47	78	mg/kg OC	0.87	0.53
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Bis(2-ethylhexyl)phthalate	0.055	mg/kg dw		2.12	2.6	47	78	mg/kg OC	0.055	0.033
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Butyl benzyl phthalate	0.037	mg/kg dw		2.2	1.7	4.9	64	mg/kg OC	0.35	0.027
2	1.6	0 to 4	Hardie Gypsum-1	1998	Butyl benzyl phthalate	0.036	mg/kg dw		2.3	1.6	4.9	64	mg/kg OC	0.33	0.025
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.038	mg/kg dw		2.52	1.5	4.9	64	mg/kg OC	0.31	0.023
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.021	mg/kg dw		2.18	0.96	4.9	64	mg/kg OC	0.2	0.015
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.038	mg/kg dw	J	2.17	1.8	4.9	64	mg/kg OC	0.37	0.028
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.04	mg/kg dw	J	2.05	2	4.9	64	mg/kg OC	0.41	0.031
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.028	mg/kg dw		2.12	1.3	4.9	64	mg/kg OC	0.27	0.02
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.01	mg/kg dw	J	1.6	0.63	4.9	64	mg/kg OC	0.13	0.0098
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.03	mg/kg dw	J	1.76	1.7	4.9	64	mg/kg OC	0.35	0.027
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.008	mg/kg dw		1.39	0.58	4.9	64	mg/kg OC	0.12	0.0091
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.0086	mg/kg dw		1.78	0.48	4.9	64	mg/kg OC	0.098	0.0075
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.024	mg/kg dw		2.14	1.1	4.9	64	mg/kg OC	0.22	0.017
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.03	mg/kg dw		2.29	1.3	4.9	64	mg/kg OC	0.27	0.02
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.032	mg/kg dw		1.3	2.5	4.9	64	mg/kg OC	0.51	0.039
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.024	mg/kg dw		1.46	1.6	4.9	64	mg/kg OC	0.33	0.025
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Butyl benzyl phthalate	0.017	mg/kg dw	J	2.24	0.76	4.9	64	mg/kg OC	0.16	0.012
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Cadmium	0.66	mg/kg dw		1.8		5.1	6.7	mg/kg dw	0.13	0.099
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Cadmium	0.73	mg/kg dw		2.2		5.1	6.7	mg/kg dw	0.14	0.11
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Cadmium	0.22	mg/kg dw		0.7		5.1	6.7	mg/kg dw	0.043	0.033
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Cadmium	0.11	mg/kg dw		0.23		5.1	6.7	mg/kg dw	0.022	0.016
1	1.6	0 to 4	Hardie Gypsum-1	1998	Cadmium	0.25	mg/kg dw		1.3		5.1	6.7	mg/kg dw	0.049	0.037
2	1.6	0 to 4	Hardie Gypsum-1	1998	Cadmium	0.51	mg/kg dw		2.3		5.1	6.7	mg/kg dw	0.1	0.076
3	1.7	0 to 4	Hardie Gypsum-1	1998	Cadmium	0.44	mg/kg dw		2.1		5.1	6.7	mg/kg dw	0.086	0.066
A	1.6	0 to 3	Hardie Gypsum-2	1999	Cadmium	0.25	mg/kg dw		2.1		5.1	6.7	mg/kg dw	0.049	0.037

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units	TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
B	1.6	0 to 3	Hardie Gypsum-2	1999	Cadmium	0.19	mg/kg dw	1.9		5.1	6.7	mg/kg dw	0.037	0.028
C	1.7	0 to 3	Hardie Gypsum-2	1999	Cadmium	0.16	mg/kg dw	1.9		5.1	6.7	mg/kg dw	0.031	0.024
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Cadmium	0.21	mg/kg dw	1.9		5.1	6.7	mg/kg dw	0.041	0.031
3	1.7	0 to 3	Hardie Gypsum-2	1999	Cadmium	0.13	mg/kg dw	1.5		5.1	6.7	mg/kg dw	0.025	0.019
1	3.5	0 to 2	PSDDA98	1998	Cadmium	0.4	mg/kg dw	1.9		5.1	6.7	mg/kg dw	0.078	0.06
2	3.7	0 to 2	PSDDA98	1998	Cadmium	0.4	mg/kg dw	2.1		5.1	6.7	mg/kg dw	0.078	0.06
3	3.9	0 to 2	PSDDA98	1998	Cadmium	0.5	mg/kg dw	2.2		5.1	6.7	mg/kg dw	0.098	0.075
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Cadmium	0.5	mg/kg dw	2.52		5.1	6.7	mg/kg dw	0.098	0.075
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Cadmium	0.5	mg/kg dw	2.18		5.1	6.7	mg/kg dw	0.098	0.075
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Cadmium	0.5	mg/kg dw	2.12		5.1	6.7	mg/kg dw	0.098	0.075
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Cadmium	1.5	mg/kg dw	2.24		5.1	6.7	mg/kg dw	0.29	0.22
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Cadmium	0.9	mg/kg dw	2.12		5.1	6.7	mg/kg dw	0.18	0.13
2	1.6	0 to 4	Hardie Gypsum-1	1998	Chlordane	3.8	ug/kg dw	2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Chlordane	2.5	ug/kg dw	2.1						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Chromium	11.4	mg/kg dw	0.541		260	270	mg/kg dw	0.044	0.042
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Chromium	10.6	mg/kg dw	0.271		260	270	mg/kg dw	0.041	0.039
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Chromium	35	mg/kg dw	2.52		260	270	mg/kg dw	0.13	0.13
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Chromium	31.1	mg/kg dw	2.18		260	270	mg/kg dw	0.12	0.12
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Chromium	8.9	mg/kg dw	0.11		260	270	mg/kg dw	0.034	0.033
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Chromium	29.5	mg/kg dw	2.12		260	270	mg/kg dw	0.11	0.11
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Chromium	33.4	mg/kg dw	2.14		260	270	mg/kg dw	0.13	0.12
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Chromium	56.9	mg/kg dw	2.24		260	270	mg/kg dw	0.22	0.21
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Chromium	35.3	mg/kg dw	2.12		260	270	mg/kg dw	0.14	0.13
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Chrysene	0.25	mg/kg dw	1.8	14	110	460	mg/kg OC	0.13	0.03
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Chrysene	0.41	mg/kg dw	2.2	19	110	460	mg/kg OC	0.17	0.041
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Chrysene	0.057	mg/kg dw	0.7	8.1	110	460	mg/kg OC	0.074	0.018
1	1.6	0 to 4	Hardie Gypsum-1	1998	Chrysene	0.15	mg/kg dw	1.3	12	110	460	mg/kg OC	0.11	0.026
2	1.6	0 to 4	Hardie Gypsum-1	1998	Chrysene	0.23	mg/kg dw	2.3	10	110	460	mg/kg OC	0.091	0.022
3	1.7	0 to 4	Hardie Gypsum-1	1998	Chrysene	0.16	mg/kg dw	2.1	7.6	110	460	mg/kg OC	0.069	0.017
A	1.6	0 to 3	Hardie Gypsum-2	1999	Chrysene	0.2	mg/kg dw	2.1	9.5	110	460	mg/kg OC	0.086	0.021
B	1.6	0 to 3	Hardie Gypsum-2	1999	Chrysene	0.44	mg/kg dw	1.9	23	110	460	mg/kg OC	0.21	0.05
C	1.7	0 to 3	Hardie Gypsum-2	1999	Chrysene	1.4	mg/kg dw	1.9	74	110	460	mg/kg OC	0.67	0.16
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Chrysene	0.34	mg/kg dw	1.9	18	110	460	mg/kg OC	0.16	0.039
3	1.7	0 to 3	Hardie Gypsum-2	1999	Chrysene	0.16	mg/kg dw	1.5	11	110	460	mg/kg OC	0.1	0.024
1	3.5	0 to 2	PSDDA98	1998	Chrysene	0.07	mg/kg dw	1.9	3.7	110	460	mg/kg OC	0.034	0.008
2	3.7	0 to 2	PSDDA98	1998	Chrysene	0.12	mg/kg dw	2.1	5.7	110	460	mg/kg OC	0.052	0.012
3	3.9	0 to 2	PSDDA98	1998	Chrysene	0.095	mg/kg dw	2.2	4.3	110	460	mg/kg OC	0.039	0.0093
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Chrysene	0.025	mg/kg dw	0.541	4.6	110	460	mg/kg OC	0.042	0.01
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Chrysene	0.33	mg/kg dw	2.52	13	110	460	mg/kg OC	0.12	0.028
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Chrysene	0.25	mg/kg dw	2.18	11	110	460	mg/kg OC	0.1	0.024
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Chrysene	0.48	mg/kg dw	2.17	22	110	460	mg/kg OC	0.2	0.048
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Chrysene	0.69	mg/kg dw	2.05	34	110	460	mg/kg OC	0.31	0.074
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Chrysene	0.29	mg/kg dw	2.12	14	110	460	mg/kg OC	0.13	0.03
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Chrysene	0.5	mg/kg dw	1.6	31	110	460	mg/kg OC	0.28	0.067
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Chrysene	0.5	mg/kg dw	1.76	28	110	460	mg/kg OC	0.25	0.061
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Chrysene	0.23	mg/kg dw	1.39	17	110	460	mg/kg OC	0.15	0.037
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Chrysene	1.1	mg/kg dw	1.78	62	110	460	mg/kg OC	0.56	0.13
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	7.2	mg/kg dw	2.14	340	110	460	mg/kg OC	3.1	0.74
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	3.1	mg/kg dw	2.29	140	110	460	mg/kg OC	1.3	0.3
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	7.8	mg/kg dw	1.3	600	110	460	mg/kg OC	5.5	1.3
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Chrysene	0.22	mg/kg dw	1.46	15	110	460	mg/kg OC	0.14	0.033
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Chrysene	0.28	mg/kg dw	2.24	13	110	460	mg/kg OC	0.12	0.028
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Chrysene	0.12	mg/kg dw	2.12	5.7	110	460	mg/kg OC	0.052	0.012
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Cobalt	4.3	mg/kg dw	0.541						
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Cobalt	3.9	mg/kg dw	0.271						

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Cobalt	9.7	mg/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Cobalt	9.2	mg/kg dw		2.18						
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Cobalt	3.6	mg/kg dw		0.11						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Cobalt	9	mg/kg dw		2.12						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Cobalt	10.9	mg/kg dw		2.14						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Cobalt	9.6	mg/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Cobalt	8.1	mg/kg dw		2.12						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Copper	77	mg/kg dw		1.8		390	390	mg/kg dw	0.2	0.2
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Copper	120	mg/kg dw		2.2		390	390	mg/kg dw	0.31	0.31
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Copper	36	mg/kg dw		0.7		390	390	mg/kg dw	0.092	0.092
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Copper	26	mg/kg dw		0.23		390	390	mg/kg dw	0.067	0.067
1	1.6	0 to 4	Hardie Gypsum-1	1998	Copper	50	mg/kg dw		1.3		390	390	mg/kg dw	0.13	0.13
2	1.6	0 to 4	Hardie Gypsum-1	1998	Copper	84	mg/kg dw		2.3		390	390	mg/kg dw	0.22	0.22
3	1.7	0 to 4	Hardie Gypsum-1	1998	Copper	65	mg/kg dw		2.1		390	390	mg/kg dw	0.17	0.17
A	1.6	0 to 3	Hardie Gypsum-2	1999	Copper	61	mg/kg dw		2.1		390	390	mg/kg dw	0.16	0.16
B	1.6	0 to 3	Hardie Gypsum-2	1999	Copper	50	mg/kg dw		1.9		390	390	mg/kg dw	0.13	0.13
C	1.7	0 to 3	Hardie Gypsum-2	1999	Copper	170	mg/kg dw		1.9		390	390	mg/kg dw	0.44	0.44
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Copper	70	mg/kg dw		1.9		390	390	mg/kg dw	0.18	0.18
3	1.7	0 to 3	Hardie Gypsum-2	1999	Copper	54	mg/kg dw		1.5		390	390	mg/kg dw	0.14	0.14
1	3.5	0 to 2	PSDDA98	1998	Copper	25	mg/kg dw		1.9		390	390	mg/kg dw	0.064	0.064
2	3.7	0 to 2	PSDDA98	1998	Copper	42.6	mg/kg dw		2.1		390	390	mg/kg dw	0.11	0.11
3	3.9	0 to 2	PSDDA98	1998	Copper	41.3	mg/kg dw		2.2		390	390	mg/kg dw	0.11	0.11
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Copper	11.1	mg/kg dw	J	0.541		390	390	mg/kg dw	0.028	0.028
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Copper	16.4	mg/kg dw	J	0.271		390	390	mg/kg dw	0.042	0.042
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Copper	88.4	mg/kg dw		2.52		390	390	mg/kg dw	0.23	0.23
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Copper	72.9	mg/kg dw		2.18		390	390	mg/kg dw	0.19	0.19
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Copper	9.3	mg/kg dw		0.11		390	390	mg/kg dw	0.024	0.024
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Copper	67.7	mg/kg dw		2.12		390	390	mg/kg dw	0.17	0.17
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Copper	73.3	mg/kg dw		2.14		390	390	mg/kg dw	0.19	0.19
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Copper	85.2	mg/kg dw	J	2.24		390	390	mg/kg dw	0.22	0.22
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Copper	46.7	mg/kg dw	J	2.12		390	390	mg/kg dw	0.12	0.12
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	DDTs (total-calc'd)	3.9	ug/kg dw		1.8						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	DDTs (total-calc'd)	1.6	ug/kg dw		0.7						
2	3.7	0 to 2	PSDDA98	1998	DDTs (total-calc'd)	1.1	ug/kg dw	J	2.1						
3	3.9	0 to 2	PSDDA98	1998	DDTs (total-calc'd)	1.4	ug/kg dw	J	2.2						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Dibenzo(a,h)anthracene	0.027	mg/kg dw		1.8	1.5	12	33	mg/kg OC	0.13	0.045
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Dibenzo(a,h)anthracene	0.037	mg/kg dw		2.2	1.7	12	33	mg/kg OC	0.14	0.052
2	3.7	0 to 2	PSDDA98	1998	Dibenzo(a,h)anthracene	0.027	mg/kg dw		2.1	1.3	12	33	mg/kg OC	0.11	0.039
3	3.9	0 to 2	PSDDA98	1998	Dibenzo(a,h)anthracene	0.02	mg/kg dw		2.2	0.9	12	33	mg/kg OC	0.075	0.027
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.024	mg/kg dw	J	2.17	1.1	12	33	mg/kg OC	0.092	0.033
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.032	mg/kg dw	J	2.05	1.6	12	33	mg/kg OC	0.13	0.048
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.032	mg/kg dw	J	1.6	2	12	33	mg/kg OC	0.17	0.061
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.029	mg/kg dw	J	1.76	1.6	12	33	mg/kg OC	0.13	0.048
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.014	mg/kg dw		1.39	1	12	33	mg/kg OC	0.083	0.03
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.08	mg/kg dw		1.78	4.5	12	33	mg/kg OC	0.38	0.14
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.18	mg/kg dw		2.14	8.4	12	33	mg/kg OC	0.7	0.25
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.08	mg/kg dw		2.29	3.5	12	33	mg/kg OC	0.29	0.11
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.18	mg/kg dw		1.3	14	12	33	mg/kg OC	1.2	0.42
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Dibenzo(a,h)anthracene	0.043	mg/kg dw		1.46	2.9	12	33	mg/kg OC	0.24	0.088
B	1.6	0 to 3	Hardie Gypsum-2	1999	Dibenzofuran	0.14	mg/kg dw		1.9	7.4	15	58	mg/kg OC	0.49	0.13
C	1.7	0 to 3	Hardie Gypsum-2	1999	Dibenzofuran	0.25	mg/kg dw		1.9	13	15	58	mg/kg OC	0.87	0.22
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Dibenzofuran	0.056	mg/kg dw		1.9	2.9	15	58	mg/kg OC	0.19	0.05
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.11	mg/kg dw		1.39	7.9	15	58	mg/kg OC	0.53	0.14
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.12	mg/kg dw		1.78	6.7	15	58	mg/kg OC	0.45	0.12
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.11	mg/kg dw		2.14	5.1	15	58	mg/kg OC	0.34	0.088

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.32	mg/kg dw		2.29	14	15	58	mg/kg OC	0.93	0.24
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Dibenzofuran	0.65	mg/kg dw		1.3	50	15	58	mg/kg OC	3.3	0.86
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Dibutyltin as ion	13	ug/kg dw		2.52						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Dibutyltin as ion	12	ug/kg dw		2.12						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Dieldrin	2.6	ug/kg dw		2.1						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Dieldrin	2.2	ug/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Dieldrin	2.6	ug/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Dieldrin	2.8	ug/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Dieldrin	3.3	ug/kg dw		1.5						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Di-n-butyl phthalate	0.047	mg/kg dw		0.541	8.7	220	1700	mg/kg OC	0.04	0.0051
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Di-n-butyl phthalate	0.033	mg/kg dw	J	2.52	1.3	220	1700	mg/kg OC	0.0059	0.00076
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Di-n-butyl phthalate	11	ug/kg dw	J	0.11		1400	5100	ug/kg dw	0.0079	0.0022
3	1.7	0 to 4	Hardie Gypsum-1	1998	Di-n-octyl phthalate	0.03	mg/kg dw		2.1	1.4	58	4500	mg/kg OC	0.024	0.00031
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Ethylbenzene	5	ug/kg dw		1.9						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Fluoranthene	0.35	mg/kg dw		1.8	19	160	1200	mg/kg OC	0.12	0.016
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Fluoranthene	0.69	mg/kg dw		2.2	31	160	1200	mg/kg OC	0.19	0.026
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Fluoranthene	0.074	mg/kg dw		0.7	11	160	1200	mg/kg OC	0.069	0.0092
1	1.6	0 to 4	Hardie Gypsum-1	1998	Fluoranthene	0.22	mg/kg dw		1.3	17	160	1200	mg/kg OC	0.11	0.014
2	1.6	0 to 4	Hardie Gypsum-1	1998	Fluoranthene	0.38	mg/kg dw		2.3	17	160	1200	mg/kg OC	0.11	0.014
3	1.7	0 to 4	Hardie Gypsum-1	1998	Fluoranthene	0.54	mg/kg dw		2.1	26	160	1200	mg/kg OC	0.16	0.022
A	1.6	0 to 3	Hardie Gypsum-2	1999	Fluoranthene	0.22	mg/kg dw		2.1	10	160	1200	mg/kg OC	0.063	0.0083
B	1.6	0 to 3	Hardie Gypsum-2	1999	Fluoranthene	1.2	mg/kg dw		1.9	63	160	1200	mg/kg OC	0.39	0.053
C	1.7	0 to 3	Hardie Gypsum-2	1999	Fluoranthene	2.4	mg/kg dw		1.9	130	160	1200	mg/kg OC	0.81	0.11
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Fluoranthene	0.6	mg/kg dw		1.9	32	160	1200	mg/kg OC	0.2	0.027
3	1.7	0 to 3	Hardie Gypsum-2	1999	Fluoranthene	0.22	mg/kg dw		1.5	15	160	1200	mg/kg OC	0.094	0.013
1	3.5	0 to 2	PSDDA98	1998	Fluoranthene	0.16	mg/kg dw		1.9	8.4	160	1200	mg/kg OC	0.053	0.007
2	3.7	0 to 2	PSDDA98	1998	Fluoranthene	0.2	mg/kg dw		2.1	10	160	1200	mg/kg OC	0.063	0.0083
3	3.9	0 to 2	PSDDA98	1998	Fluoranthene	0.13	mg/kg dw		2.2	5.9	160	1200	mg/kg OC	0.037	0.0049
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.042	mg/kg dw		0.541	7.8	160	1200	mg/kg OC	0.049	0.0065
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.6	mg/kg dw		2.52	24	160	1200	mg/kg OC	0.15	0.02
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.32	mg/kg dw		2.18	15	160	1200	mg/kg OC	0.094	0.013
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.41	mg/kg dw		2.17	19	160	1200	mg/kg OC	0.12	0.016
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.92	mg/kg dw		2.05	45	160	1200	mg/kg OC	0.28	0.038
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.45	mg/kg dw	J	2.12	21	160	1200	mg/kg OC	0.13	0.018
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.75	mg/kg dw		1.6	47	160	1200	mg/kg OC	0.29	0.039
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.58	mg/kg dw		1.76	33	160	1200	mg/kg OC	0.21	0.028
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Fluoranthene	1.2	mg/kg dw		1.39	86	160	1200	mg/kg OC	0.54	0.072
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Fluoranthene	2.4	mg/kg dw		1.78	130	160	1200	mg/kg OC	0.81	0.11
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	7.4	mg/kg dw	J	2.14	350	160	1200	mg/kg OC	2.2	0.29
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	10	mg/kg dw		2.29	440	160	1200	mg/kg OC	2.8	0.37
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	24	mg/kg dw		1.3	1800	160	1200	mg/kg OC	11	1.5
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.42	mg/kg dw		1.46	29	160	1200	mg/kg OC	0.18	0.024
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.28	mg/kg dw		2.24	13	160	1200	mg/kg OC	0.081	0.011
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Fluoranthene	0.084	mg/kg dw		2.12	4	160	1200	mg/kg OC	0.025	0.0033
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Fluorene	0.039	mg/kg dw		2.2	1.8	23	79	mg/kg OC	0.078	0.023
B	1.6	0 to 3	Hardie Gypsum-2	1999	Fluorene	0.13	mg/kg dw		1.9	6.8	23	79	mg/kg OC	0.3	0.086
C	1.7	0 to 3	Hardie Gypsum-2	1999	Fluorene	0.29	mg/kg dw		1.9	15	23	79	mg/kg OC	0.65	0.19
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Fluorene	0.044	mg/kg dw	J	1.6	2.8	23	79	mg/kg OC	0.12	0.035
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Fluorene	0.047	mg/kg dw	J	1.76	2.7	23	79	mg/kg OC	0.12	0.034
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Fluorene	0.23	mg/kg dw		1.39	17	23	79	mg/kg OC	0.74	0.22
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Fluorene	0.19	mg/kg dw		1.78	11	23	79	mg/kg OC	0.48	0.14
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Fluorene	0.26	mg/kg dw		2.14	12	23	79	mg/kg OC	0.52	0.15
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluorene	0.46	mg/kg dw		2.29	20	23	79	mg/kg OC	0.87	0.25
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Fluorene	1.8	mg/kg dw		1.3	140	23	79	mg/kg OC	6.1	1.8
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Hexachlorobutadiene	0.0029	mg/kg dw		1.9	0.15	3.9	6.2	mg/kg OC	0.038	0.024

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Hexachloroethane	56	ug/kg dw		1.9						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Indeno(1,2,3-cd)pyrene	0.11	mg/kg dw		1.8	6.1	34	88	mg/kg OC	0.18	0.069
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Indeno(1,2,3-cd)pyrene	0.14	mg/kg dw		2.2	6.4	34	88	mg/kg OC	0.19	0.073
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Indeno(1,2,3-cd)pyrene	0.035	mg/kg dw		0.7	5	34	88	mg/kg OC	0.15	0.057
1	1.6	0 to 4	Hardie Gypsum-1	1998	Indeno(1,2,3-cd)pyrene	0.061	mg/kg dw		1.3	4.7	34	88	mg/kg OC	0.14	0.053
2	1.6	0 to 4	Hardie Gypsum-1	1998	Indeno(1,2,3-cd)pyrene	0.1	mg/kg dw		2.3	4.3	34	88	mg/kg OC	0.13	0.049
3	1.7	0 to 4	Hardie Gypsum-1	1998	Indeno(1,2,3-cd)pyrene	0.071	mg/kg dw		2.1	3.4	34	88	mg/kg OC	0.1	0.039
B	1.6	0 to 3	Hardie Gypsum-2	1999	Indeno(1,2,3-cd)pyrene	0.091	mg/kg dw		1.9	4.8	34	88	mg/kg OC	0.14	0.055
C	1.7	0 to 3	Hardie Gypsum-2	1999	Indeno(1,2,3-cd)pyrene	0.21	mg/kg dw		1.9	11	34	88	mg/kg OC	0.32	0.13
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Indeno(1,2,3-cd)pyrene	0.076	mg/kg dw		1.9	4	34	88	mg/kg OC	0.12	0.045
2	3.7	0 to 2	PSDDA98	1998	Indeno(1,2,3-cd)pyrene	0.095	mg/kg dw		2.1	4.5	34	88	mg/kg OC	0.13	0.051
3	3.9	0 to 2	PSDDA98	1998	Indeno(1,2,3-cd)pyrene	0.073	mg/kg dw		2.2	3.3	34	88	mg/kg OC	0.097	0.038
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.098	mg/kg dw		2.52	3.9	34	88	mg/kg OC	0.11	0.044
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.056	mg/kg dw	J	2.18	2.6	34	88	mg/kg OC	0.076	0.03
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.18	mg/kg dw		2.17	8.3	34	88	mg/kg OC	0.24	0.094
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.22	mg/kg dw		2.05	11	34	88	mg/kg OC	0.32	0.13
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.052	mg/kg dw	J	2.12	2.5	34	88	mg/kg OC	0.074	0.028
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.21	mg/kg dw		1.6	13	34	88	mg/kg OC	0.38	0.15
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.21	mg/kg dw		1.76	12	34	88	mg/kg OC	0.35	0.14
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.049	mg/kg dw	J	1.39	3.5	34	88	mg/kg OC	0.1	0.04
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.4	mg/kg dw		1.78	22	34	88	mg/kg OC	0.65	0.25
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.68	mg/kg dw	J	2.14	32	34	88	mg/kg OC	0.94	0.36
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.37	mg/kg dw		2.29	16	34	88	mg/kg OC	0.47	0.18
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.93	mg/kg dw		1.3	72	34	88	mg/kg OC	2.1	0.82
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.083	mg/kg dw		1.46	5.7	34	88	mg/kg OC	0.17	0.065
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.071	mg/kg dw		2.24	3.2	34	88	mg/kg OC	0.094	0.036
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Indeno(1,2,3-cd)pyrene	0.024	mg/kg dw		2.12	1.1	34	88	mg/kg OC	0.032	0.013
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Lead	83	mg/kg dw		1.8		450	530	mg/kg dw	0.18	0.16
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Lead	160	mg/kg dw		2.2		450	530	mg/kg dw	0.36	0.3
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Lead	35	mg/kg dw		0.7		450	530	mg/kg dw	0.078	0.066
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Lead	17	mg/kg dw		0.23		450	530	mg/kg dw	0.038	0.032
1	1.6	0 to 4	Hardie Gypsum-1	1998	Lead	14	mg/kg dw		1.3		450	530	mg/kg dw	0.031	0.026
2	1.6	0 to 4	Hardie Gypsum-1	1998	Lead	55	mg/kg dw		2.3		450	530	mg/kg dw	0.12	0.1
3	1.7	0 to 4	Hardie Gypsum-1	1998	Lead	51	mg/kg dw		2.1		450	530	mg/kg dw	0.11	0.096
A	1.6	0 to 3	Hardie Gypsum-2	1999	Lead	50	mg/kg dw		2.1		450	530	mg/kg dw	0.11	0.094
B	1.6	0 to 3	Hardie Gypsum-2	1999	Lead	37	mg/kg dw		1.9		450	530	mg/kg dw	0.082	0.07
C	1.7	0 to 3	Hardie Gypsum-2	1999	Lead	32	mg/kg dw		1.9		450	530	mg/kg dw	0.071	0.06
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Lead	78	mg/kg dw		1.9		450	530	mg/kg dw	0.17	0.15
3	1.7	0 to 3	Hardie Gypsum-2	1999	Lead	45	mg/kg dw		1.5		450	530	mg/kg dw	0.1	0.085
1	3.5	0 to 2	PSDDA98	1998	Lead	32	mg/kg dw		1.9		450	530	mg/kg dw	0.071	0.06
2	3.7	0 to 2	PSDDA98	1998	Lead	22	mg/kg dw		2.1		450	530	mg/kg dw	0.049	0.042
3	3.9	0 to 2	PSDDA98	1998	Lead	22	mg/kg dw		2.2		450	530	mg/kg dw	0.049	0.042
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Lead	3	mg/kg dw		0.541		450	530	mg/kg dw	0.0067	0.0057
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Lead	49	mg/kg dw		2.52		450	530	mg/kg dw	0.11	0.092
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Lead	43	mg/kg dw		2.18		450	530	mg/kg dw	0.096	0.081
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Lead	56	mg/kg dw	J	2.12		450	530	mg/kg dw	0.12	0.11
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Lead	46	mg/kg dw	J	2.14		450	530	mg/kg dw	0.1	0.087
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Lead	108	mg/kg dw		2.24		450	530	mg/kg dw	0.24	0.2
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Lead	43	mg/kg dw		2.12		450	530	mg/kg dw	0.096	0.081
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Mercury	0.11	mg/kg dw		1.8		0.41	0.59	mg/kg dw	0.27	0.19
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Mercury	0.089	mg/kg dw		2.2		0.41	0.59	mg/kg dw	0.22	0.15
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Mercury	0.069	mg/kg dw		0.7		0.41	0.59	mg/kg dw	0.17	0.12
1	1.6	0 to 4	Hardie Gypsum-1	1998	Mercury	0.18	mg/kg dw		1.3		0.41	0.59	mg/kg dw	0.44	0.31
2	1.6	0 to 4	Hardie Gypsum-1	1998	Mercury	0.21	mg/kg dw		2.3		0.41	0.59	mg/kg dw	0.51	0.36
3	1.7	0 to 4	Hardie Gypsum-1	1998	Mercury	0.17	mg/kg dw		2.1		0.41	0.59	mg/kg dw	0.41	0.29

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentratio n (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
A	1.6	0 to 3	Hardie Gypsum-2	1999	Mercury	0.16	mg/kg dw		2.1		0.41	0.59	mg/kg dw	0.39	0.27
B	1.6	0 to 3	Hardie Gypsum-2	1999	Mercury	0.17	mg/kg dw		1.9		0.41	0.59	mg/kg dw	0.41	0.29
C	1.7	0 to 3	Hardie Gypsum-2	1999	Mercury	0.17	mg/kg dw		1.9		0.41	0.59	mg/kg dw	0.41	0.29
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Mercury	0.22	mg/kg dw		1.9		0.41	0.59	mg/kg dw	0.54	0.37
3	1.7	0 to 3	Hardie Gypsum-2	1999	Mercury	0.21	mg/kg dw		1.5		0.41	0.59	mg/kg dw	0.51	0.36
1	3.5	0 to 2	PSDDA98	1998	Mercury	0.12	mg/kg dw		1.9		0.41	0.59	mg/kg dw	0.29	0.2
3	3.9	0 to 2	PSDDA98	1998	Mercury	0.11	mg/kg dw		2.2		0.41	0.59	mg/kg dw	0.27	0.19
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Mercury	0.33	mg/kg dw		2.52		0.41	0.59	mg/kg dw	0.8	0.56
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Mercury	0.22	mg/kg dw		2.18		0.41	0.59	mg/kg dw	0.54	0.37
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Mercury	0.2	mg/kg dw		2.12		0.41	0.59	mg/kg dw	0.49	0.34
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Mercury	0.2	mg/kg dw		2.14		0.41	0.59	mg/kg dw	0.49	0.34
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Mercury	0.52	mg/kg dw		2.24		0.41	0.59	mg/kg dw	1.3	0.88
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Mercury	0.41	mg/kg dw		2.12		0.41	0.59	mg/kg dw	1	0.69
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Molybdenum	1	mg/kg dw		2.18						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Molybdenum	1.1	mg/kg dw		2.14						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Molybdenum	2.5	mg/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Molybdenum	1.9	mg/kg dw		2.12						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Monobutyltin as ion	8	ug/kg dw		2.12						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Naphthalene	0.44	mg/kg dw		1.9	23	99	170	mg/kg OC	0.23	0.14
C	1.7	0 to 3	Hardie Gypsum-2	1999	Naphthalene	0.12	mg/kg dw		1.9	6.3	99	170	mg/kg OC	0.064	0.037
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Naphthalene	0.11	mg/kg dw		1.78	6.2	99	170	mg/kg OC	0.063	0.036
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Naphthalene	0.055	mg/kg dw	J	2.29	2.4	99	170	mg/kg OC	0.024	0.014
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Naphthalene	0.2	mg/kg dw		1.3	15	99	170	mg/kg OC	0.15	0.088
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Naphthalene	0.012	mg/kg dw	J	2.12	0.57	99	170	mg/kg OC	0.0058	0.0034
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Nickel	42	mg/kg dw		1.8						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Nickel	44	mg/kg dw		2.2						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Nickel	32	mg/kg dw		0.7						
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Nickel	22	mg/kg dw		0.23						
1	1.6	0 to 4	Hardie Gypsum-1	1998	Nickel	15	mg/kg dw		1.3						
2	1.6	0 to 4	Hardie Gypsum-1	1998	Nickel	24	mg/kg dw		2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Nickel	15	mg/kg dw		2.1						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Nickel	17	mg/kg dw		2.1						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Nickel	14	mg/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Nickel	15	mg/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Nickel	17	mg/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Nickel	15	mg/kg dw		1.5						
1	3.5	0 to 2	PSDDA98	1998	Nickel	21.9	mg/kg dw		1.9						
2	3.7	0 to 2	PSDDA98	1998	Nickel	26	mg/kg dw		2.1						
3	3.9	0 to 2	PSDDA98	1998	Nickel	26	mg/kg dw		2.2						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Nickel	7	mg/kg dw	J	0.541						
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Nickel	6	mg/kg dw	J	0.271						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Nickel	22	mg/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Nickel	21	mg/kg dw		2.18						
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Nickel	6	mg/kg dw		0.11						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Nickel	22	mg/kg dw		2.12				mg/kg dw		
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Nickel	28	mg/kg dw		2.14				mg/kg dw		
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Nickel	27	mg/kg dw	J	2.24				mg/kg dw		
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Nickel	19	mg/kg dw	J	2.12				mg/kg dw		
2b	1.6	0 to 3	Hardie Gypsum-2	1999	N-Nitrosodiphenylamine	0.028	mg/kg dw		1.9	1.5	11	11	mg/kg OC	0.14	0.14
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	PCBs (total calc'd)	0.14	mg/kg dw		1.8	7.8	12	65	mg/kg OC	0.65	0.12
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	PCBs (total calc'd)	0.13	mg/kg dw		2.2	5.9	12	65	mg/kg OC	0.49	0.091
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	PCBs (total calc'd)	0.071	mg/kg dw		0.7	10	12	65	mg/kg OC	0.83	0.15
1	1.6	0 to 4	Hardie Gypsum-1	1998	PCBs (total calc'd)	0.107	mg/kg dw		1.3	8.2	12	65	mg/kg OC	0.68	0.13
2	1.6	0 to 4	Hardie Gypsum-1	1998	PCBs (total calc'd)	0.29	mg/kg dw		2.3	13	12	65	mg/kg OC	1.1	0.2
3	1.7	0 to 4	Hardie Gypsum-1	1998	PCBs (total calc'd)	0.24	mg/kg dw		2.1	11	12	65	mg/kg OC	0.92	0.17

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
A	1.6	0 to 3	Hardie Gypsum-2	1999	PCBs (total calc'd)	0.116	mg/kg dw		2.1	5.5	12	65	mg/kg OC	0.46	0.085
B	1.6	0 to 3	Hardie Gypsum-2	1999	PCBs (total calc'd)	0.137	mg/kg dw		1.9	7.2	12	65	mg/kg OC	0.6	0.11
C	1.7	0 to 3	Hardie Gypsum-2	1999	PCBs (total calc'd)	0.142	mg/kg dw		1.9	7.5	12	65	mg/kg OC	0.63	0.12
2b	1.6	0 to 3	Hardie Gypsum-2	1999	PCBs (total calc'd)	0.14	mg/kg dw		1.9	7.4	12	65	mg/kg OC	0.62	0.11
3	1.7	0 to 3	Hardie Gypsum-2	1999	PCBs (total calc'd)	0.175	mg/kg dw		1.5	12	12	65	mg/kg OC	1	0.18
1	3.5	0 to 2	PSDDA98	1998	PCBs (total calc'd)	0.035	mg/kg dw	J	1.9	1.8	12	65	mg/kg OC	0.15	0.028
2	3.7	0 to 2	PSDDA98	1998	PCBs (total calc'd)	0.05	mg/kg dw		2.1	2	12	65	mg/kg OC	0.17	0.031
3	3.9	0 to 2	PSDDA98	1998	PCBs (total calc'd)	0.051	mg/kg dw		2.2	2.3	12	65	mg/kg OC	0.19	0.035
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.0129	mg/kg dw		0.541	2.4	12	65	mg/kg OC	0.2	0.037
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.37	mg/kg dw		2.52	15	12	65	mg/kg OC	1.3	0.23
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.33	mg/kg dw		2.18	15	12	65	mg/kg OC	1.3	0.23
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	2.7	ug/kg dw	J	0.11		130	1000	ug/kg dw	0.021	0.0027
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.177	mg/kg dw		2.12	8.3	12	65	mg/kg OC	0.69	0.13
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.219	mg/kg dw		2.14	10	12	65	mg/kg OC	0.83	0.15
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.88	mg/kg dw		1.46	60	12	65	mg/kg OC	5	0.92
LDW-SC23	1.2	6 to 8	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.4	mg/kg dw		2.25	18	12	65	mg/kg OC	1.5	0.28
LDW-SC23	1.2	8 to 10	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.041	mg/kg dw		1.63	2.5	12	65	mg/kg OC	0.21	0.038
LDW-SC27	1.4	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	2	mg/kg dw		1.8	110	12	65	mg/kg OC	9.2	1.7
LDW-SC27	1.4	0 to 1	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.25	mg/kg dw		1.54	16	12	65	mg/kg OC	1.3	0.25
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	3.3	mg/kg dw		2.24	150	12	65	mg/kg OC	13	2.3
LDW-SC27	1.4	1 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	1.51	mg/kg dw		1.82	83	12	65	mg/kg OC	6.9	1.3
LDW-SC27	1.4	1 to 2	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	3.2	mg/kg dw		1.22	260	12	65	mg/kg OC	22	4
LDW-SC27	1.4	2 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.29	mg/kg dw		2.27	13	12	65	mg/kg OC	1.1	0.2
LDW-SC27	1.4	2 to 3	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.84	mg/kg dw		2.14	39	12	65	mg/kg OC	3.3	0.6
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.25	mg/kg dw	J	2.12	12	12	65	mg/kg OC	1	0.18
LDW-SC27	1.4	3 to 4	LDW Subsurface Sediment 2006	2006	PCBs (total calc'd)	0.06	mg/kg dw		1.8	3.3	12	65	mg/kg OC	0.28	0.051
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Pentachlorophenol	40	ug/kg dw		1.46		360	690	ug/kg dw	0.11	0.058
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Phenanthrene	0.12	mg/kg dw		1.8	6.7	100	480	mg/kg OC	0.067	0.014
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Phenanthrene	0.24	mg/kg dw		2.2	11	100	480	mg/kg OC	0.11	0.023
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Phenanthrene	0.027	mg/kg dw		0.7	3.9	100	480	mg/kg OC	0.039	0.0081
1	1.6	0 to 4	Hardie Gypsum-1	1998	Phenanthrene	0.068	mg/kg dw		1.3	5.2	100	480	mg/kg OC	0.052	0.011
2	1.6	0 to 4	Hardie Gypsum-1	1998	Phenanthrene	0.15	mg/kg dw		2.3	6.5	100	480	mg/kg OC	0.065	0.014
3	1.7	0 to 4	Hardie Gypsum-1	1998	Phenanthrene	0.077	mg/kg dw		2.1	3.7	100	480	mg/kg OC	0.037	0.0077
A	1.6	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	0.11	mg/kg dw		2.1	5.2	100	480	mg/kg OC	0.052	0.011
B	1.6	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	0.66	mg/kg dw		1.9	35	100	480	mg/kg OC	0.35	0.073
C	1.7	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	2.2	mg/kg dw		1.9	120	100	480	mg/kg OC	1.2	0.25
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	0.45	mg/kg dw		1.9	24	100	480	mg/kg OC	0.24	0.05
3	1.7	0 to 3	Hardie Gypsum-2	1999	Phenanthrene	0.1	mg/kg dw		1.5	6.7	100	480	mg/kg OC	0.067	0.014
1	3.5	0 to 2	PSDDA98	1998	Phenanthrene	0.075	mg/kg dw		1.9	3.9	100	480	mg/kg OC	0.039	0.0081
2	3.7	0 to 2	PSDDA98	1998	Phenanthrene	0.072	mg/kg dw		2.1	3.4	100	480	mg/kg OC	0.034	0.0071
3	3.9	0 to 2	PSDDA98	1998	Phenanthrene	0.055	mg/kg dw		2.2	2.5	100	480	mg/kg OC	0.025	0.0052
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.015	mg/kg dw	J	0.541	2.8	100	480	mg/kg OC	0.028	0.0058
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.14	mg/kg dw		2.52	5.6	100	480	mg/kg OC	0.056	0.012
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.1	mg/kg dw		2.18	4.6	100	480	mg/kg OC	0.046	0.0096
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.14	mg/kg dw		2.17	6.5	100	480	mg/kg OC	0.065	0.014
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.21	mg/kg dw		2.05	10	100	480	mg/kg OC	0.1	0.021
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.1	mg/kg dw		2.12	4.7	100	480	mg/kg OC	0.047	0.0098
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.48	mg/kg dw		1.6	30	100	480	mg/kg OC	0.3	0.063
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.38	mg/kg dw		1.76	22	100	480	mg/kg OC	0.22	0.046
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.38	mg/kg dw		1.39	27	100	480	mg/kg OC	0.27	0.056
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Phenanthrene	1.7	mg/kg dw		1.78	96	100	480	mg/kg OC	0.96	0.2
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Phenanthrene	1.2	mg/kg dw		2.14	56	100	480	mg/kg OC	0.56	0.12
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Phenanthrene	1.3	mg/kg dw		2.29	57	100	480	mg/kg OC	0.57	0.12
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Phenanthrene	12	mg/kg dw		1.3	920	100	480	mg/kg OC	9.2	1.9
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.15	mg/kg dw		1.46	10	100	480	mg/kg OC	0.1	0.021

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.16	mg/kg dw		2.24	7.1	100	480	mg/kg OC	0.071	0.015
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Phenanthrene	0.06	mg/kg dw		2.12	2.8	100	480	mg/kg OC	0.028	0.0058
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Phenol	32	ug/kg dw		1.8		420	1200	ug/kg dw	0.076	0.027
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Phenol	36	ug/kg dw		2.2		420	1200	ug/kg dw	0.086	0.03
C	1.7	0 to 3	Hardie Gypsum-2	1999	Phenol	99	ug/kg dw		1.9		420	1200	ug/kg dw	0.24	0.083
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Phenol	240	ug/kg dw		1.9		420	1200	ug/kg dw	0.57	0.2
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Phenol	18	ug/kg dw	J	2.12		420	1200	ug/kg dw	0.043	0.015
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Pyrene	0.41	mg/kg dw		1.8	23	1000	1400	mg/kg OC	0.023	0.016
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Pyrene	0.72	mg/kg dw		2.2	33	1000	1400	mg/kg OC	0.033	0.024
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Pyrene	0.097	mg/kg dw		0.7	14	1000	1400	mg/kg OC	0.014	0.01
1	1.6	0 to 4	Hardie Gypsum-1	1998	Pyrene	0.24	mg/kg dw		1.3	18	1000	1400	mg/kg OC	0.018	0.013
2	1.6	0 to 4	Hardie Gypsum-1	1998	Pyrene	0.41	mg/kg dw		2.3	18	1000	1400	mg/kg OC	0.018	0.013
3	1.7	0 to 4	Hardie Gypsum-1	1998	Pyrene	0.66	mg/kg dw		2.1	31	1000	1400	mg/kg OC	0.031	0.022
A	1.6	0 to 3	Hardie Gypsum-2	1999	Pyrene	0.37	mg/kg dw		2.1	18	1000	1400	mg/kg OC	0.018	0.013
B	1.6	0 to 3	Hardie Gypsum-2	1999	Pyrene	1.1	mg/kg dw		1.9	58	1000	1400	mg/kg OC	0.058	0.041
C	1.7	0 to 3	Hardie Gypsum-2	1999	Pyrene	2.8	mg/kg dw		1.9	150	1000	1400	mg/kg OC	0.15	0.11
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Pyrene	0.67	mg/kg dw		1.9	35	1000	1400	mg/kg OC	0.035	0.025
3	1.7	0 to 3	Hardie Gypsum-2	1999	Pyrene	0.38	mg/kg dw		1.5	25	1000	1400	mg/kg OC	0.025	0.018
1	3.5	0 to 2	PSDDA98	1998	Pyrene	0.029	mg/kg dw		1.9	1.5	1000	1400	mg/kg OC	0.0015	0.0011
2	3.7	0 to 2	PSDDA98	1998	Pyrene	0.24	mg/kg dw		2.1	11	1000	1400	mg/kg OC	0.011	0.0079
3	3.9	0 to 2	PSDDA98	1998	Pyrene	0.17	mg/kg dw		2.2	7.7	1000	1400	mg/kg OC	0.0077	0.0055
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Pyrene	0.026	mg/kg dw		0.541	4.8	1000	1400	mg/kg OC	0.0048	0.0034
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Pyrene	0.41	mg/kg dw		2.52	16	1000	1400	mg/kg OC	0.016	0.011
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Pyrene	0.43	mg/kg dw		2.18	20	1000	1400	mg/kg OC	0.02	0.014
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Pyrene	0.66	mg/kg dw		2.17	30	1000	1400	mg/kg OC	0.03	0.021
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Pyrene	0.92	mg/kg dw		2.05	45	1000	1400	mg/kg OC	0.045	0.032
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Pyrene	0.64	mg/kg dw		2.12	30	1000	1400	mg/kg OC	0.03	0.021
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Pyrene	1	mg/kg dw		1.6	63	1000	1400	mg/kg OC	0.063	0.045
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Pyrene	1	mg/kg dw		1.76	57	1000	1400	mg/kg OC	0.057	0.041
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Pyrene	0.7	mg/kg dw		1.39	50	1000	1400	mg/kg OC	0.05	0.036
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Pyrene	3	mg/kg dw		1.78	170	1000	1400	mg/kg OC	0.17	0.12
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Pyrene	3.8	mg/kg dw		2.14	180	1000	1400	mg/kg OC	0.18	0.13
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Pyrene	4.4	mg/kg dw		2.29	190	1000	1400	mg/kg OC	0.19	0.14
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Pyrene	14	mg/kg dw		1.3	1100	1000	1400	mg/kg OC	1.1	0.79
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Pyrene	0.74	mg/kg dw		1.46	51	1000	1400	mg/kg OC	0.051	0.036
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Pyrene	0.76	mg/kg dw		2.24	34	1000	1400	mg/kg OC	0.034	0.024
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Pyrene	0.21	mg/kg dw		2.12	9.9	1000	1400	mg/kg OC	0.0099	0.0071
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Silver	0.24	mg/kg dw		1.8		6.1	6.1	mg/kg dw	0.039	0.039
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Silver	0.67	mg/kg dw		2.2		6.1	6.1	mg/kg dw	0.11	0.11
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Silver	0.34	mg/kg dw		0.7		6.1	6.1	mg/kg dw	0.056	0.056
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Silver	0.22	mg/kg dw		0.23		6.1	6.1	mg/kg dw	0.036	0.036
1	1.6	0 to 4	Hardie Gypsum-1	1998	Silver	0.58	mg/kg dw		1.3		6.1	6.1	mg/kg dw	0.095	0.095
2	1.6	0 to 4	Hardie Gypsum-1	1998	Silver	0.92	mg/kg dw		2.3		6.1	6.1	mg/kg dw	0.15	0.15
3	1.7	0 to 4	Hardie Gypsum-1	1998	Silver	0.97	mg/kg dw		2.1		6.1	6.1	mg/kg dw	0.16	0.16
A	1.6	0 to 3	Hardie Gypsum-2	1999	Silver	0.37	mg/kg dw		2.1		6.1	6.1	mg/kg dw	0.061	0.061
B	1.6	0 to 3	Hardie Gypsum-2	1999	Silver	0.23	mg/kg dw		1.9		6.1	6.1	mg/kg dw	0.038	0.038
C	1.7	0 to 3	Hardie Gypsum-2	1999	Silver	0.18	mg/kg dw		1.9		6.1	6.1	mg/kg dw	0.03	0.03
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Silver	0.41	mg/kg dw		1.9		6.1	6.1	mg/kg dw	0.067	0.067
3	1.7	0 to 3	Hardie Gypsum-2	1999	Silver	0.29	mg/kg dw		1.5		6.1	6.1	mg/kg dw	0.048	0.048
1	3.5	0 to 2	PSDDA98	1998	Silver	0.3	mg/kg dw		1.9		6.1	6.1	mg/kg dw	0.049	0.049
2	3.7	0 to 2	PSDDA98	1998	Silver	0.5	mg/kg dw		2.1		6.1	6.1	mg/kg dw	0.082	0.082
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Silver	1.9	mg/kg dw		2.24		6.1	6.1	mg/kg dw	0.31	0.31
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Silver	0.9	mg/kg dw		2.12		6.1	6.1	mg/kg dw	0.15	0.15
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Tetrachloroethene	5	ug/kg dw		1.9						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Total aldrin/dieldrin (calc'd)	2.6	ug/kg dw		2.1						

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
B	1.6	0 to 3	Hardie Gypsum-2	1999	Total aldrin/dieldrin (calc'd)	2.2	ug/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Total aldrin/dieldrin (calc'd)	2.6	ug/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Total aldrin/dieldrin (calc'd)	2.8	ug/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Total aldrin/dieldrin (calc'd)	3.3	ug/kg dw		1.5						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Total HPAH (calc'd)	2.12	mg/kg dw		1.8	120	960	5300	mg/kg OC	0.13	0.023
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Total HPAH (calc'd)	3.39	mg/kg dw		2.2	150	960	5300	mg/kg OC	0.16	0.028
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Total HPAH (calc'd)	0.515	mg/kg dw		0.7	74	960	5300	mg/kg OC	0.077	0.014
1	1.6	0 to 4	Hardie Gypsum-1	1998	Total HPAH (calc'd)	1.15	mg/kg dw		1.3	88	960	5300	mg/kg OC	0.092	0.017
2	1.6	0 to 4	Hardie Gypsum-1	1998	Total HPAH (calc'd)	1.85	mg/kg dw		2.3	80	960	5300	mg/kg OC	0.083	0.015
3	1.7	0 to 4	Hardie Gypsum-1	1998	Total HPAH (calc'd)	2.07	mg/kg dw		2.1	99	960	5300	mg/kg OC	0.1	0.019
A	1.6	0 to 3	Hardie Gypsum-2	1999	Total HPAH (calc'd)	1.26	mg/kg dw		2.1	60	960	5300	mg/kg OC	0.063	0.011
B	1.6	0 to 3	Hardie Gypsum-2	1999	Total HPAH (calc'd)	3.9	mg/kg dw		1.9	210	960	5300	mg/kg OC	0.22	0.04
C	1.7	0 to 3	Hardie Gypsum-2	1999	Total HPAH (calc'd)	9.4	mg/kg dw		1.9	490	960	5300	mg/kg OC	0.51	0.092
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Total HPAH (calc'd)	2.5	mg/kg dw		1.9	130	960	5300	mg/kg OC	0.14	0.025
3	1.7	0 to 3	Hardie Gypsum-2	1999	Total HPAH (calc'd)	1.16	mg/kg dw		1.5	77	960	5300	mg/kg OC	0.08	0.015
1	3.5	0 to 2	PSDDA98	1998	Total HPAH (calc'd)	0.43	mg/kg dw		1.9	23	960	5300	mg/kg OC	0.024	0.0043
2	3.7	0 to 2	PSDDA98	1998	Total HPAH (calc'd)	1.2	mg/kg dw		2.1	60	960	5300	mg/kg OC	0.063	0.011
3	3.9	0 to 2	PSDDA98	1998	Total HPAH (calc'd)	0.9	mg/kg dw		2.2	40	960	5300	mg/kg OC	0.042	0.0075
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	0.183	mg/kg dw	J	0.541	34	960	5300	mg/kg OC	0.035	0.0064
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.55	mg/kg dw		2.52	100	960	5300	mg/kg OC	0.1	0.019
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.05	mg/kg dw	J	2.18	94	960	5300	mg/kg OC	0.098	0.018
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	3.33	mg/kg dw	J	2.17	150	960	5300	mg/kg OC	0.16	0.028
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	4.84	mg/kg dw	J	2.05	240	960	5300	mg/kg OC	0.25	0.045
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.57	mg/kg dw	J	2.12	120	960	5300	mg/kg OC	0.13	0.023
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	4.2	mg/kg dw	J	1.6	260	960	5300	mg/kg OC	0.27	0.049
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	4.2	mg/kg dw	J	1.76	240	960	5300	mg/kg OC	0.25	0.045
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.8	mg/kg dw	J	1.39	200	960	5300	mg/kg OC	0.21	0.038
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	10.9	mg/kg dw		1.78	610	960	5300	mg/kg OC	0.64	0.12
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	31.5	mg/kg dw	J	2.14	1500	960	5300	mg/kg OC	1.6	0.28
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	25	mg/kg dw		2.29	1100	960	5300	mg/kg OC	1.1	0.21
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	64	mg/kg dw		1.3	4900	960	5300	mg/kg OC	5.1	0.92
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.47	mg/kg dw		1.46	170	960	5300	mg/kg OC	0.18	0.032
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	2.44	mg/kg dw		2.24	110	960	5300	mg/kg OC	0.11	0.021
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Total HPAH (calc'd)	0.79	mg/kg dw		2.12	37	960	5300	mg/kg OC	0.039	0.007
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Total LPAH (calc'd)	0.16	mg/kg dw		1.8	8.9	370	780	mg/kg OC	0.024	0.011
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Total LPAH (calc'd)	0.38	mg/kg dw		2.2	17	370	780	mg/kg OC	0.046	0.022
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Total LPAH (calc'd)	0.027	mg/kg dw		0.7	3.9	370	780	mg/kg OC	0.011	0.005
1	1.6	0 to 4	Hardie Gypsum-1	1998	Total LPAH (calc'd)	0.097	mg/kg dw		1.3	7.5	370	780	mg/kg OC	0.02	0.0096
2	1.6	0 to 4	Hardie Gypsum-1	1998	Total LPAH (calc'd)	0.19	mg/kg dw		2.3	8.3	370	780	mg/kg OC	0.022	0.011
3	1.7	0 to 4	Hardie Gypsum-1	1998	Total LPAH (calc'd)	0.109	mg/kg dw		2.1	5.2	370	780	mg/kg OC	0.014	0.0067
A	1.6	0 to 3	Hardie Gypsum-2	1999	Total LPAH (calc'd)	0.11	mg/kg dw		2.1	5.2	370	780	mg/kg OC	0.014	0.0067
B	1.6	0 to 3	Hardie Gypsum-2	1999	Total LPAH (calc'd)	1.66	mg/kg dw		1.9	87	370	780	mg/kg OC	0.24	0.11
C	1.7	0 to 3	Hardie Gypsum-2	1999	Total LPAH (calc'd)	3	mg/kg dw		1.9	160	370	780	mg/kg OC	0.43	0.21
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Total LPAH (calc'd)	0.51	mg/kg dw		1.9	27	370	780	mg/kg OC	0.073	0.035
3	1.7	0 to 3	Hardie Gypsum-2	1999	Total LPAH (calc'd)	0.1	mg/kg dw		1.5	6.7	370	780	mg/kg OC	0.018	0.0086
1	3.5	0 to 2	PSDDA98	1998	Total LPAH (calc'd)	0.075	mg/kg dw		1.9	3.9	370	780	mg/kg OC	0.011	0.005
2	3.7	0 to 2	PSDDA98	1998	Total LPAH (calc'd)	0.072	mg/kg dw		2.1	3.4	370	780	mg/kg OC	0.0092	0.0044
3	3.9	0 to 2	PSDDA98	1998	Total LPAH (calc'd)	0.055	mg/kg dw		2.2	2.5	370	780	mg/kg OC	0.0068	0.0032
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.015	mg/kg dw	J	0.541	2.8	370	780	mg/kg OC	0.0076	0.0036
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.21	mg/kg dw		2.52	8.3	370	780	mg/kg OC	0.022	0.011
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.15	mg/kg dw	J	2.18	6.9	370	780	mg/kg OC	0.019	0.0088
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.23	mg/kg dw		2.17	11	370	780	mg/kg OC	0.03	0.014
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.38	mg/kg dw	J	2.05	19	370	780	mg/kg OC	0.051	0.024
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.17	mg/kg dw		2.12	8	370	780	mg/kg OC	0.022	0.01
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.66	mg/kg dw	J	1.6	41	370	780	mg/kg OC	0.11	0.053

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.59	mg/kg dw	J	1.76	34	370	780	mg/kg OC	0.092	0.044
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	1.35	mg/kg dw		1.39	97	370	780	mg/kg OC	0.26	0.12
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	2.7	mg/kg dw	J	1.78	150	370	780	mg/kg OC	0.41	0.19
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	3.5	mg/kg dw		2.14	160	370	780	mg/kg OC	0.43	0.21
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	4.5	mg/kg dw	J	2.29	200	370	780	mg/kg OC	0.54	0.26
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	25	mg/kg dw		1.3	1900	370	780	mg/kg OC	5.1	2.4
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.2	mg/kg dw	J	1.46	14	370	780	mg/kg OC	0.038	0.018
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.23	mg/kg dw		2.24	10	370	780	mg/kg OC	0.027	0.013
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Total LPAH (calc'd)	0.106	mg/kg dw	J	2.12	5	370	780	mg/kg OC	0.014	0.0064
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Total PAH (calc'd)	2280	ug/kg dw		1.8						
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Total PAH (calc'd)	3770	ug/kg dw		2.2						
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Total PAH (calc'd)	542	ug/kg dw		0.7						
1	1.6	0 to 4	Hardie Gypsum-1	1998	Total PAH (calc'd)	1250	ug/kg dw		1.3						
2	1.6	0 to 4	Hardie Gypsum-1	1998	Total PAH (calc'd)	2040	ug/kg dw		2.3						
3	1.7	0 to 4	Hardie Gypsum-1	1998	Total PAH (calc'd)	2180	ug/kg dw		2.1						
A	1.6	0 to 3	Hardie Gypsum-2	1999	Total PAH (calc'd)	1370	ug/kg dw		2.1						
B	1.6	0 to 3	Hardie Gypsum-2	1999	Total PAH (calc'd)	5600	ug/kg dw		1.9						
C	1.7	0 to 3	Hardie Gypsum-2	1999	Total PAH (calc'd)	12400	ug/kg dw		1.9						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Total PAH (calc'd)	3010	ug/kg dw		1.9						
3	1.7	0 to 3	Hardie Gypsum-2	1999	Total PAH (calc'd)	1260	ug/kg dw		1.5						
1	3.5	0 to 2	PSDDA98	1998	Total PAH (calc'd)	510	ug/kg dw		1.9						
2	3.7	0 to 2	PSDDA98	1998	Total PAH (calc'd)	1200	ug/kg dw		2.1						
3	3.9	0 to 2	PSDDA98	1998	Total PAH (calc'd)	1000	ug/kg dw		2.2						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	198	ug/kg dw	J	0.541						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	2760	ug/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	2190	ug/kg dw	J	2.18						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	3560	ug/kg dw	J	2.17						
LDW-SC23	1.2	0 to 1	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	5230	ug/kg dw	J	2.05						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	2730	ug/kg dw	J	2.12						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	4800	ug/kg dw	J	1.6						
LDW-SC23	1.2	1 to 2	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	4800	ug/kg dw	J	1.76						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	4200	ug/kg dw	J	1.39						
LDW-SC23	1.2	2 to 3	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	13500	ug/kg dw	J	1.78						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	34900	ug/kg dw	J	2.14						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	30000	ug/kg dw	J	2.29						
LDW-SC23	1.2	3 to 4	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	89000	ug/kg dw		1.3						
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	2670	ug/kg dw	J	1.46						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	2670	ug/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Total PAH (calc'd)	900	ug/kg dw	J	2.12						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Tributyltin as ion	46	ug/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Tributyltin as ion	49	ug/kg dw		2.18						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Tributyltin as ion	55	ug/kg dw		2.12						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Tributyltin as ion	47	ug/kg dw		2.14						
LDW-SC23	1.2	4 to 6	LDW Subsurface Sediment 2006	2006	Tributyltin as ion	27	ug/kg dw		1.46						
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Trichloroethene	5	ug/kg dw		1.9						
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Vanadium	45.6	mg/kg dw		0.541						
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Vanadium	43	mg/kg dw		0.271						
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Vanadium	75.2	mg/kg dw		2.52						
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Vanadium	68	mg/kg dw		2.18						
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Vanadium	36.1	mg/kg dw		0.11						
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Vanadium	65	mg/kg dw		2.12						
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Vanadium	71.5	mg/kg dw		2.14						
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Vanadium	73.4	mg/kg dw		2.24						
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Vanadium	67.5	mg/kg dw		2.12						
c-2	1.7	0 to 5	Lone Star-Hardie Gypsum	1995	Zinc	180	mg/kg dw		1.8		410	960	mg/kg dw	0.44	0.19

Table A-2
Contaminants Detected in Subsurface Sediment
RM 1.2-1.7 East

Sample Location Name	Sample River Mile Location	Sample Depth Interval (feet)	Sampling Event	Sampling Event Year	Contaminant	Concentration Value	Concentration Units		TOC % DW	Concentration (mg/kg OC)	SQS[1]	CSL[1]	SQS/CSL Units	SQS Exceedance Factor[2]	CSL Exceedance Factor[2]
c-3	1.6	0 to 5	Lone Star-Hardie Gypsum	1995	Zinc	270	mg/kg dw		2.2		410	960	mg/kg dw	0.66	0.28
c-4	1.6	0 to 4	Lone Star-Hardie Gypsum	1995	Zinc	99	mg/kg dw		0.7		410	960	mg/kg dw	0.24	0.1
c-4	1.6	4 to 12	Lone Star-Hardie Gypsum	1995	Zinc	65	mg/kg dw		0.23		410	960	mg/kg dw	0.16	0.068
1	1.6	0 to 4	Hardie Gypsum-1	1998	Zinc	82	mg/kg dw		1.3		410	960	mg/kg dw	0.2	0.085
2	1.6	0 to 4	Hardie Gypsum-1	1998	Zinc	160	mg/kg dw		2.3		410	960	mg/kg dw	0.39	0.17
3	1.7	0 to 4	Hardie Gypsum-1	1998	Zinc	120	mg/kg dw		2.1		410	960	mg/kg dw	0.29	0.13
A	1.6	0 to 3	Hardie Gypsum-2	1999	Zinc	120	mg/kg dw		2.1		410	960	mg/kg dw	0.29	0.13
B	1.6	0 to 3	Hardie Gypsum-2	1999	Zinc	96	mg/kg dw		1.9		410	960	mg/kg dw	0.23	0.1
C	1.7	0 to 3	Hardie Gypsum-2	1999	Zinc	160	mg/kg dw		1.9		410	960	mg/kg dw	0.39	0.17
2b	1.6	0 to 3	Hardie Gypsum-2	1999	Zinc	140	mg/kg dw		1.9		410	960	mg/kg dw	0.34	0.15
3	1.7	0 to 3	Hardie Gypsum-2	1999	Zinc	110	mg/kg dw		1.5		410	960	mg/kg dw	0.27	0.11
1	3.5	0 to 2	PSDDA98	1998	Zinc	75.2	mg/kg dw		1.9		410	960	mg/kg dw	0.18	0.078
2	3.7	0 to 2	PSDDA98	1998	Zinc	91.4	mg/kg dw		2.1		410	960	mg/kg dw	0.22	0.095
3	3.9	0 to 2	PSDDA98	1998	Zinc	97.8	mg/kg dw		2.2		410	960	mg/kg dw	0.24	0.1
LDW-SC30	1.6	0 to 2	LDW Subsurface Sediment 2006	2006	Zinc	27.3	mg/kg dw		0.541		410	960	mg/kg dw	0.067	0.028
LDW-SC30	1.6	3 to 4	LDW Subsurface Sediment 2006	2006	Zinc	20.5	mg/kg dw		0.271		410	960	mg/kg dw	0.05	0.021
LDW-SC31	1.7	0 to 1	LDW Subsurface Sediment 2006	2006	Zinc	139	mg/kg dw		2.52		410	960	mg/kg dw	0.34	0.14
LDW-SC31	1.7	1 to 3	LDW Subsurface Sediment 2006	2006	Zinc	131	mg/kg dw		2.18		410	960	mg/kg dw	0.32	0.14
LDW-SC31	1.7	3 to 4	LDW Subsurface Sediment 2006	2006	Zinc	18.5	mg/kg dw		0.11		410	960	mg/kg dw	0.045	0.019
LDW-SC23	1.2	0 to 2	LDW Subsurface Sediment 2006	2006	Zinc	122	mg/kg dw	J	2.12		410	960	mg/kg dw	0.3	0.13
LDW-SC23	1.2	2 to 4	LDW Subsurface Sediment 2006	2006	Zinc	159	mg/kg dw	J	2.14		410	960	mg/kg dw	0.39	0.17
LDW-SC27	1.4	0 to 2	LDW Subsurface Sediment 2006	2006	Zinc	190	mg/kg dw		2.24		410	960	mg/kg dw	0.46	0.2
LDW-SC27	1.4	2 to 4	LDW Subsurface Sediment 2006	2006	Zinc	103	mg/kg dw		2.12		410	960	mg/kg dw	0.25	0.11

Key:
DW - Dry weight
CSL - Cleanup Screening Level
OC - Organic carbon
TOC - Total organic carbon
SQS - Sediment Quality Standard

Notes:
1. SQS and CSL values are substituted with AET values for dry weight comparison where organic compounds are not OC-normalized (when TOC % DW is outside of the 0.5-4.0% range).
2. Exceedance factors are the ratio of the detected concentration to the CSL or SQS (or to AET values where applicable); chemicals with one or more exceedance factors greater than 1 are highlighted.

Source:
Lower Duwamish Waterway Group, 2007. Online Lower Duwamish Waterway Group Draft Remedial Investigation Report (November 2007) Database. http://www.ldwg.org.

Appendix B

Toxics Release Inventory, Quantities of Releases Summarized by Report Type

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Table B-1
Summary of TRI Release Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Fugitive Air	Stack Air	Total Air Emissions	Surface Water Discharge	Underground Injection	Land Disposal	Total On-site Disposal or Other Releases	Total Off-site Disposal or Other Releases	Total On- and Off-site Disposal or Other Releases
Chromium Compounds	1988	250	0	250	0	0	0	250	250	500
Chromium Compounds	1989	250	0	250	0	0	0	250	250	500
Chromium Compounds	1990	5	0	5	0	0	0	5	250	255
Chromium Compounds	1991	0	0	0	.	0	0	0	250	250
Chromium Compounds	1992	0	0	0	.	0	0	0	17138	17138
Chromium Compounds	1993	5	0	5	.	0	0	5	130522	130527
Chromium Compounds	1994	0	0	0	.	0	0	0	20866	20866
Chromium Compounds	1995	5	0	5	.	0	0	5	500	505
Chromium Compounds	1996	5	0	5	.	0	0	5	54586	54591
Chromium Compounds	1997	5	0	5	.	0	0	5	250	255
Ethylene Glycol	1997	0	0	0	.	0	0	0	1850	1850
Chromium Compounds	1998	5	0	5	.	0	0	5	0	5
Chromium Compounds	1999	5	0	5	.	0	0	5	.	5
Chromium Compounds	2000	.	.	.	.	.	.	.	.	0
Chromium Compounds	2001	.	.	.	.	.	.	.	.	0
Lead Compounds	2001	0	409	409	.	0	0	409	9	418
Chromium Compounds	2002	.	.	.	.	.	.	.	.	0
Lead Compounds	2002	0	432	432	.	0	0	432	13	445
Chromium Compounds	2003	.	.	.	.	.	.	.	.	0
Lead Compounds	2003	0	485	485	.	0	0	485	10	495
Chromium Compounds	2004	.	.	.	.	.	.	.	.	0
Lead Compounds	2004	0	445	445	.	0	0	445	3	448
Chromium Compounds	2005	.	.	.	.	.	.	.	.	0
Lead Compounds	2005	0	375	375	.	0	0	375	2	377

Key:

Fugitive Air: fugitive air emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Stack Air: stack or point source air emissions occur through confined air streams suck as stack, vents, ducts, or pipes.

Total Air Emissions: includes both fugitive air emissions and point source air emissions.

Surface Water Discharge: releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from confined sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff are also reportable to TRI under this category.

Underground Injection: underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment.

Land Disposal: the disposal of the toxic chemical to land at the facility that does not fall into one of the other on-site land release categories found in Sections 5.5.1 through 5.5.3 on the TRI Form R. Other disposal includes such activities as placement in waste piles and spills or leaks.

Total On-Site Disposal or Other Releases: include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type.

Total Off-site Disposal or Other Releases: a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site disposal or other release.

Total On- and Off-Site Disposal and Other Releases: the sum of total on-site disposal or other release and total off-site disposal or other releases.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-2
Summary of TRI Waste Transfer Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Transfers to Recycling	Transferred to Energy Recovery	Transfers to Treatment	Transfers to POTWs Non Metals	Transfers Off-site for Disposal or Other Releases	Total Transfers Off-site for Further Waste Management
Chromium Compounds	1988	0	0	0	0	0	250
Chromium Compounds	1989	0	0	0	0	0	250
Chromium Compounds	1990	0	0	0	0	0	250
Chromium Compounds	1991	0	0	0	0	0	250
Chromium Compounds	1992	0	0	0	0	0	17138
Chromium Compounds	1993	0	0	0	0	0	130522
Chromium Compounds	1994	0	0	0	0	0	20866
Chromium Compounds	1995	0	0	0	0	0	500
Chromium Compounds	1996	0	0	0	0	0	54586
Chromium Compounds	1997	0	0	0	0	0	250
Ethylene Glycol	1997	0	0	0	0	0	1850
Chromium Compounds	1998	0	0	0	0	0	0
Chromium Compounds	1999	0	0	0	0	0	0
Chromium Compounds	2000	.	.	.	.	.	.
Chromium Compounds	2001	.	.	.	.	.	.
Lead Compounds	2001	0	0	0	0	0	9
Chromium Compounds	2002	.	.	.	.	.	.
Lead Compounds	2002	0	0	0	0	0	13
Chromium Compounds	2003	.	.	.	.	.	.
Lead Compounds	2003	0	0	0	0	0	10
Chromium Compounds	2004	.	.	.	.	.	.
Lead Compounds	2004	0	0	0	0	0	3
Chromium Compounds	2005	.	.	.	.	.	.
Lead Compounds	2005	0	0	0	0	0	2

Key:

Transfers to Recycling: the total among of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year (January 1 - December 31) for recycling to manage the toxic chemical. This refers to the ultimate disposition of the toxic chemical, not the intermediate activities used for the waste stream.

Transferred to Energy Recovery: the total amount of the toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for energy recovery to manage the toxic chemical.

Transfers to treatment: the total amount of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for treatment to manage the toxic chemical.

Transfers to POWs Non Metals: the total amount of the toxic chemical in the waste stream transferred from the facility to all POTWs during the calendar year.

Transfers Off-Site for Disposal or Other Releases: sum of transfers to underground injection, RCRA Subtitle C landfills, other landfills, storage, solidification/stabilization of metals and metal category compounds, RCRA Subtitle C surface impoundments, other surface impoundments, land treatment, other land disposal, other off-site waste management, waste broker for disposal, and unknown.

Total Transfers Off-Site of Further Waste Management: the sum of transfers to recycling, transfers to energy recovery, transfers to treatment, transfers to POTWs and other off-site transfers, including transfers to disposal or other releases.

POTW = Publicly Owned Treatment Works

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-3
Summary of TRI Waste Quantity Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Recycled On-site	Recycled Off-site	Energy Recovery On-site	Energy Recovery Off-site	Treated On-site	Treated Off-site	Total Quantity Disposed or Otherwise Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
Chromium Compounds	1988	.	.	.	.	.	.	.	.	.
Chromium Compounds	1989	.	.	.	.	.	.	.	.	.
Chromium Compounds	1990	.	.	.	.	.	.	.	.	.
Chromium Compounds	1991	0	0	0	0	0	0	67	67	0
Chromium Compounds	1992	0	0	0	0	0	0	17000	17000	0
Chromium Compounds	1993	0	0	0	0	0	0	132328	132328	0
Chromium Compounds	1994	0	0	0	0	0	0	20645	20645	0
Chromium Compounds	1995	0	0	0	0	0	0	444	444	0
Chromium Compounds	1996	0	0	0	0	0	0	54400	54400	0
Chromium Compounds	1997	0	0	0	0	0	0	418	418	0
Ethylene Glycol	1997	0	1850	0	0	0	0	0	1850	0
Chromium Compounds	1998	0	0	0	0	0	0	1	1	0
Chromium Compounds	1999	0	0	0	0	0	0	1	1	0
Chromium Compounds	2000	.	.	.	.	.	.	.	.	.
Chromium Compounds	2001	.	.	.	.	.	.	.	.	.
Lead Compounds	2001	0	0	0	0	0	0	418	418	0
Chromium Compounds	2002	.	.	.	.	.	.	.	.	.
Lead Compounds	2002	0	0	0	0	0	0	445	445	0
Chromium Compounds	2003	.	.	.	.	.	.	.	.	.
Lead Compounds	2003	0	0	0	0	0	0	495	495	0
Chromium Compounds	2004	.	.	.	.	.	.	.	.	.
Lead Compounds	2004	0	0	0	0	0	0	448	448	0
Chromium Compounds	2005	.	.	.	.	.	.	.	.	.
Lead Compounds	2005	0	0	0	0	0	0	377	377	0

Key:

Recycled On-site: the amount of the toxic chemical recycled on-site during the calendar year for which the report was submitted.

Recycled Off-site: the total amount of the toxic chemical sent off-site for recycling during the calendar year for which the report was submitted.

Energy Recovery On-site: the total amount of the toxic chemical in waste burned for energy recovery on-site during the calendar year for which the report was submitted.

Energy Recovery Off-site: the total amount of the toxic chemical in waste sent off-site to be burned for energy recovery during the calendar year for which the report was submitted.

Treated On-site: the total amount of the toxic chemical treated on-site during the calendar year for which the report was submitted.

Treated Off-site: the total amount of the toxic chemical sent for treatment off-site during the calendar year for which the report was submitted.

Total Quantity Disposed or otherwise released On- and Off-site: the total amount of the toxic chemical disposed of or release due to production related events by the facility to all environmental media both on and off site during the calendar year for which the report was submitted.

Total Production-related Waste Managed: the sum of recycled on-site, recycled off-site, energy recovery on-site, energy recovery off-site, treated on-site, treated off-site, and quantities disposed of or otherwise released on- and off-site.

Non-production related Waste Managed: the total amount of the toxic chemical released directly to the environment or sent off-site for recycling, energy recovery, treatment, or disposal during the reporting year due to remedial actions, catastrophic events, such as earthquakes or floods, and one-time events not associated with normal or routine production processes.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-4
Summary of TRI Release Reports for Philip Services Corporation
RM 1.4-1.7 East

Chemical	Year	Fugitive Air	Stack Air	Total Air Emissions	Surface Water Discharge	Underground Injection	Land Disposal	Total On-site Disposal or Other Releases	Total Off-site Disposal or Other Releases	Total On- and Off-site Disposal or Other Releases
1,2-Dichloroethane	1998	0	0	0	.	0	0	0	8879	8879
Asbestos (friable)	1998	0	0	0	.	0	0	0	14668	14668
Benzene	1998	0	0	0	.	0	0	0	17760	17760
Butyl Arcrylate	1998	0	0	0	.	0	0	0	8880	8880
Carbon Tetrachloride	1998	0	0	0	.	0	0	0	6190	6190
Cyanide Compounds	1998	0	0	0	.	0	0	0	0	0
Dichloromethane	1998	0	0	0	.	0	0	0	17760	17760
Ethylene Glycol	1998	0	0	0	.	0	0	0	459	459
Isopropyl Alcohol (Manufacturing, Strong-Acid Process Only, No Supplier)	1998	0	0	0	.	0	0	0	19195	19195
Lead Compounds	1998	0	0	0	.	0	0	0	910	910
Methyl Ethyl Ketone	1998	0	0	0	.	0	0	0	35518	35518
Methyl Isobutyl Ketone	1998	0	0	0	.	0	0	0	8879	8879
N-Butyl Alcohol	1998	0	0	0	.	0	0	0	6288	6288
N-Methyl-2-Pyrrolidone	1998	0	0	0	.	0	0	0	0	0
Naphthalene	1998	0	0	0	.	0	0	0	44397	44397
Toluene	1998	0	0	0	.	0	0	0	62456	62456
Trichloroethylene	1998	0	0	0	.	0	0	0	7992	7992
Xylene (Mixed Isomers)	1998	0	0	0	.	0	0	0	16079	16079
Zinc Compounds	1998	0	0	0	.	0	0	0	4489	4489
Ethylene Glycol	1999	0	0	0	.	0	0	0	168	168
Nitrate Compounds	1999	0	0	0	.	0	0	0	0	0
Ethylene Glycol	2000	0	0	0	.	0	0	0	3224	3224
Lead Compounds	2000	0	0	0	.	0	0	0	599	599
Mercury Compounds	2000	0	0	0	.	0	0	0	1432.3	1432.3
Nitrate Compounds	2000	0	0	0	.	0	0	0	0	0
Ethylene Glycol	2001	0	0	0	.	0	0	0	255	255
Lead Compounds	2001	0	0	0	.	0	0	0	35376.2	35376.2
Mercury Compounds	2001	0	0	0	.	0	0	0	68.07	68.07
Nitrate Compounds	2001	0	0	0	.	0	0	0	45679	45679
Ethylene Glycol	2002	5	0	5	.	0	0	5	0	5
Nitrate Compounds	2002	0	0	0	.	0	0	0	5334	5334

Key:

Fugitive Air: fugitive air emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Stack Air: stack or point source air emissions occur through confined air streams suck as stack, vents, ducts, or pipes.

Total Air Emissions: includes both fugitive air emissions and point source air emissions.

Surface Water Discharge: releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from confined sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff are also reportable to TRI under this category.

Underground Injection: underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment.

Land Disposal: the disposal of the toxic chemical to land at the facility that does not fall into one of the other on-site land release categories found in Sections 5.5.1 through 5.5.3 on the TRI Form R. Other disposal includes such activities as placement in waste piles and spills or leaks.

Total On-Site Disposal or Other Releases: include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type.

Total Off-site Disposal or Other Releases: a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site disposal or other release.

Total On- and Off-Site Disposal and Other Releases: the sum of total on-site disposal or other release and total off-site disposal or other releases.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-5
Summary of TRI Waste Transfer Reports for Philip Services Corporation
RM 1.4-1.7 East

Chemical	Year	Transfers to Recycling	Transferred to Energy Recovery	Transfers to Treatment	Transfers to POTWs Non Metals	Transfers Off-site for Disposal or Other Releases	Total Transfers Off-site for Further Waste Management
1,2-Dichloroethane	1998	0	32108	0	.	0	40987
Asbestos (friable)	1998	0	0	0	.	0	14668
Benzene	1998	0	64215	37	.	0	82012
Butyl Arcrylate	1998	0	32108	0	.	0	40988
Carbon Tetrachloride	1998	15105	12842	0	.	0	34137
Cyanide Compounds	1998	0	0	17545	.	0	17545
Dichloromethane	1998	6392	64115	0	.	0	88267
Ethylene Glycol	1998	728219	0	0	.	0	728678
Isopropyl Alcohol (Manufacturing, Strong-Acid Process Only, No Supplier)	1998	0	64215	901	.	0	84311
Lead Compounds	1998	15841	344	0	0	0	17095
Methyl Ethyl Ketone	1998	0	128429	0	.	0	163947
Methyl Isobutyl Ketone	1998	0	32108	0	.	0	40987
N-Butyl Alcohol	1998	0	68686	0	.	0	74974
N-Methyl-2-Pyrrolidone	1998	22843	0	0	.	0	22843
Naphthalene	1998	0	160536	0	.	0	204933
Toluene	1998	0	225894	1	.	0	288351
Trichloroethylene	1998	0	23903	0	.	0	31895
Xylene (Mixed Isomers)	1998	0	173379	0	.	0	189458
Zinc Compounds	1998	0	16052	0	0	0	20541
Ethylene Glycol	1999	276153	52	39197	.	0	315570
Nitrate Compounds	1999	0	0	21127	.	0	21127
Ethylene Glycol	2000	166205	0	100	5	.	169534
Lead Compounds	2000	25911	0	0	0	.	26510
Mercury Compounds	2000	8125.6	0	0	0	.	9557.9
Nitrate Compounds	2000	0	0	2129	5	.	2134
Ethylene Glycol	2001	169416	10	1030	0	0	170711
Lead Compounds	2001	389150.8	0	0	0	.	424527
Mercury Compounds	2001	1565.8002	0	0	0	0	1633.8702
Nitrate Compounds	2001	0	0	0	0	0	45679
Ethylene Glycol	2002	145820	0	0	0	0	145820
Nitrate Compounds	2002	0	0	0	0	0	5334

Key:

Transfers to Recycling: the total among of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year (January 1 - December 31) for recycling to manage the toxic chemical. This refers to the ultimate disposition of the toxic chemical, not the intermediate activities used for the waste stream.

Transferred to Energy Recovery: the total amount of the toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for energy recovery to manage the toxic chemical.

Transfers to treatment: the total amount of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for treatment to manage the toxic chemical.

Transfers to POWs Non Metals: the total amount of the toxic chemical in the waste stream transferred from the facility to all POTWs during the calendar year.

Transfers Off-Site for Disposal or Other Releases: sum of transfers to underground injection, RCRA Subtitle C landfills, other landfills, storage, solidification/stabilization of metals and metal category compounds, RCRA Subtitle C surface impoundments, other surface impoundments, land treatment, other land disposal, other off-site waste management, waste broker for disposal, and unknown.

Total Transfers Off-Site of Further Waste Management: the sum of transfers to recycling, transfers to energy recovery, transfers to treatment, transfers to POTWs and other off-site transfers, including transfers to disposal or other releases.

POTW = Publicly Owned Treatment Works

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-6
Summary of TRI Waste Quantity Reports for Philip Services Corporation
RM 1.4-1.7 East

Chemical	Year	Recycled On-site	Recycled Off-site	Energy Recovery On-site	Energy Recovery Off-site	Treated On-site	Treated Off-site	Total Quantity Disposed or Otherwise Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
1,2-Dichloroethane	1998	0	0	0	0	0	0	10	10	0
Asbestos (friable)	1998	0	0	0	0	0	0	1	1	0
Benzene	1998	0	0	0	0	0	0	10	10	0
Butyl Arcrylate	1998	0	0	0	0	0	0	10	10	0
Carbon Tetrachloride	1998	0	0	0	0	0	0	10	10	0
Cyanide Compounds	1998	0	0	0	0	0	0	1	1	0
Dichloromethane	1998	0	0	0	0	0	0	10	10	0
Ethylene Glycol	1998	0	0	0	0	0	0	10	10	0
Isopropyl Alcohol (Manufacturing, Strong-Acid Process Only, No Supplier)	1998	0	0	0	0	0	0	10	10	0
Lead Compounds	1998	0	0	0	0	0	0	10	10	0
Methyl Ethyl Ketone	1998	0	0	0	0	0	0	10	10	0
Methyl Isobutyl Ketone	1998	0	0	0	0	0	0	10	10	0
N-Butyl Alcohol	1998	0	0	0	0	0	0	5	5	0
N-Methyl-2-Pyrrolidone	1998	0	0	0	0	0	0	10	10	0
Naphthalene	1998	0	0	0	0	0	0	10	10	0
Toluene	1998	0	0	0	0	0	0	10	10	0
Trichloroethylene	1998	0	0	0	0	0	0	10	10	0
Xylene (Mixed Isomers)	1998	0	0	0	0	0	0	10	10	0
Zinc Compounds	1998	0	0	0	0	0	0	1	1	0
Ethylene Glycol	1999	0	276153	0	115	0	45238	0	321506	0
Nitrate Compounds	1999	0	0	0	0	37684	20311	0	57995	0
Ethylene Glycol	2000	0	166205	0	100	0	3224	1	169530	0
Lead Compounds	2000	0	25911	0	0	0	0	616	26527	0
Mercury Compounds	2000	0	9506.4	0	0	0	0	47.7	9554.1	0
Nitrate Compounds	2000	0	0	0	0	19739	0	2130	21869	0
Ethylene Glycol	2001	0	169415	0	4	0	152	35	169606	0
Lead Compounds	2001	0	389150.8	0	0	0	0	35397.03	424547.83	0
Mercury Compounds	2001	0	1566.1	0	0	0	0	67.4	1633.5	0
Nitrate Compounds	2001	0	0	0	0	0	0	45627	45627	0
Ethylene Glycol	2002	0	145820	0	0	0	0	1	145821	0
Nitrate Compounds	2002	0	0	0	0	0	0	5334	5334	0

Key:

Recycled On-site: the amount of the toxic chemical recycled on-site during the calendar year for which the report was submitted.

Recycled Off-site: the total amount of the toxic chemical sent off-site for recycling during the calendar year for which the report was submitted.

Energy Recovery On-site: the total amount of the toxic chemical in waste burned for energy recovery on-site during the calendar year for which the report was submitted.

Energy Recovery Off-site: the total amount of the toxic chemical in waste sent off-site to be burned for energy recovery during the calendar year for which the report was submitted.

Treated On-site: the total amount of the toxic chemical treated on-site during the calendar year for which the report was submitted.

Treated Off-site: the total amount of the toxic chemical sent for treatment off-site during the calendar year for which the report was submitted.

Total Quantity Disposed or otherwise released On- and Off-site: the total amount of the toxic chemical disposed of or release due to production related events by the facility to all environmental media both on and off site during the calendar year for which the report was submitted.

Total Production-related Waste Managed: the sum of recycled on-site, recycled off-site, energy recovery on-site, energy recovery off-site, treated on-site, treated off-site, and quantities disposed of or otherwise released on- and off-site.

Non-production related Waste Managed: the total amount of the toxic chemical released directly to the environment or sent off-site for recycling, energy recovery, treatment, or disposal during the reporting year due to remedial actions, catastrophic events, such as earthquakes or floods, and one-time events not associated with normal or routine production processes.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-7
Summary of TRI Release Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Fugitive Air	Stack Air	Total Air Emissions	Surface Water Discharge	Underground Injection	Land Disposal	Total On-site Disposal or Other Releases	Total Off-site Disposal or Other Releases	Total On- and Off-site Disposal or Other Releases
TRICHLOROETHYLENE	1988	45000	0	45000	0	0	0	45000	.	45000
TRICHLOROETHYLENE	1989	0	35860	35860	0	0	0	35860	.	35860
TRICHLOROETHYLENE	1990	0	39329	39329	0	0	0	39329	0	39329
TRICHLOROETHYLENE	1991	36234	0	36234	.	0	0	36234	.	36234
TRICHLOROETHYLENE	1992	32447	0	32447	.	0	0	32447	.	32447
TRICHLOROETHYLENE	1993	36278	0	36278	.	0	0	36278	.	36278
TRICHLOROETHYLENE	1994	19640	0	19640	.	0	0	19640	.	19640
TRICHLOROETHYLENE	1995	20320	0	20320	.	0	0	20320	.	20320
TRICHLOROETHYLENE	1996	15910	0	15910	.	0	0	15910	0	15910
TRICHLOROETHYLENE	1997	14380	0	14380	.	0	0	14380	0	14380
TRICHLOROETHYLENE	1998	15500	0	15500	.	0	0	15500	0	15500
TRICHLOROETHYLENE	1999	12300	0	12300	.	0	0	12300	0	12300
TRICHLOROETHYLENE	2000	17820	0	17820	.	0	0	17820	0	17820
TRICHLOROETHYLENE	2001	15200	0	15200	.	0	0	15200	0	15200
TRICHLOROETHYLENE	2002	15665	0	15665	.	0	0	15665	0	15665
TRICHLOROETHYLENE	2003	14388	0	14388	.	0	0	14388	0	14388
TRICHLOROETHYLENE	2004	11220	0	11220	.	0	0	11220	0	11220
NICKEL COMPOUNDS	2005	0	0	0	.	0	0	0	755	755

Key:

Fugitive Air: fugitive air emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Stack Air: stack or point source air emissions occur through confined air streams suck as stack, vents, ducts, or pipes.

Total Air Emissions: includes both fugitive air emissions and point source air emissions.

Surface Water Discharge: releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from confined sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff are also reportable to TRI under this category.

Underground Injection: underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment.

Land Disposal: the disposal of the toxic chemical to land at the facility that does not fall into one of the other on-site land release categories found in Sections 5.5.1 through 5.5.3 on the TRI Form R. Other disposal includes such activities as placement in waste piles and spills or leaks.

Total On-Site Disposal or Other Releases: include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type.

Total Off-site Disposal or Other Releases: a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site disposal or other release.

Total On- and Off-Site Disposal and Other Releases: the sum of total on-site disposal or other release and total off-site disposal or other releases.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-8
Summary of TRI Waste Transfer Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Transfers to Recycling	Transferred to Energy Recovery	Transfers to Treatment	Transfers to POTWs Non Metals	Transfers Off-site for Disposal or Other Releases	Total Transfers Off-site for Further Waste Management
TRICHLOROETHYLENE	1988	.	.	.	1	.	1
TRICHLOROETHYLENE	1989	.	.	.	250	.	250
TRICHLOROETHYLENE	1990	0	0	0	0	0	0
TRICHLOROETHYLENE	1991	1220	.	.	5	.	1225
TRICHLOROETHYLENE	1992	1293	.	.	5	.	1298
TRICHLOROETHYLENE	1993	1342	.	.	5	.	1347
TRICHLOROETHYLENE	1994	2020	.	.	5	.	2025
TRICHLOROETHYLENE	1995	1460	.	.	5	.	1465
TRICHLOROETHYLENE	1996	750	0	0	.	0	750
TRICHLOROETHYLENE	1997	750	0	0	.	0	750
TRICHLOROETHYLENE	1998	750	0	0	.	0	750
TRICHLOROETHYLENE	1999	750	0	0	.	0	750
TRICHLOROETHYLENE	2000	750	0	0	.	0	750
TRICHLOROETHYLENE	2001	750	0	0	.	0	750
TRICHLOROETHYLENE	2002	750	0	0	.	0	750
TRICHLOROETHYLENE	2003	750	0	0	.	0	750
TRICHLOROETHYLENE	2004	750	0	0	.	0	750
NICKEL COMPOUNDS	2005	0	0	0	0	.	755

Key:

Transfers to Recycling: the total among of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year (January 1 - December 31) for recycling to manage the toxic chemical. This refers to the ultimate disposition of the toxic chemical, not the intermediate activities used for the waste stream.

Transferred to Energy Recovery: the total amount of the toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for energy recovery to manage the toxic chemical.

Transfers to treatment: the total amount of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for treatment to manage the toxic chemical.

Transfers to POWs Non Metals: the total amount of the toxic chemical in the waste stream transferred from the facility to all POTWs during the calendar year.

Transfers Off-Site for Disposal or Other Releases: sum of transfers to underground injection, RCRA Subtitle C landfills, other landfills, storage, solidification/stabilization of metals and metal category compounds, RCRA Subtitle C surface impoundments, other surface impoundments, land treatment, other land disposal, other off-site waste management, waste broker for disposal, and unknown.

Total Transfers Off-Site of Further Waste Management: the sum of transfers to recycling, transfers to energy recovery, transfers to treatment, transfers to POTWs and other off-site transfers, including transfers to disposal or other releases.

POTW = Publicly Owned Treatment Works

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-9
Summary of TRI Waste Quantity Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Recycled On-site	Recycled Off-site	Energy Recovery On-site	Energy Recovery Off-site	Treated On-site	Treated Off-site	Total Quantity Disposed or Otherwise Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
TRICHLOROETHYLENE	1988	.	.	.	.	.	.	.	.	.
TRICHLOROETHYLENE	1989	.	.	.	.	.	.	.	.	.
TRICHLOROETHYLENE	1990	.	.	.	.	.	.	.	.	.
TRICHLOROETHYLENE	1991	0	1220	0	0	0	.	36324	37544	0
TRICHLOROETHYLENE	1992	0	1293	0	0	0	0	33740	35033	0
TRICHLOROETHYLENE	1993	0	142	0	0	0	0	36278	36420	0
TRICHLOROETHYLENE	1994	.	1333	.	.	.	2020	19640	22993	0
TRICHLOROETHYLENE	1995	.	.	.	.	.	1460	21780	23240	0
TRICHLOROETHYLENE	1996	.	.	.	.	.	690	15910	16600	0
TRICHLOROETHYLENE	1997	.	.	.	.	.	800	14380	15180	0
TRICHLOROETHYLENE	1998	0	0	0	0	0	950	15550	16500	0
TRICHLOROETHYLENE	1999	0	0	0	0	0	1000	12300	13300	0
TRICHLOROETHYLENE	2000	0	0	0	0	0	1314	17820	19134	0
TRICHLOROETHYLENE	2001	0	0	0	0	0	1000	15200	16200	0
TRICHLOROETHYLENE	2002	0	0	0	0	0	1495	15665	17160	0
TRICHLOROETHYLENE	2003	0	0	0	0	0	2112	14388	16500	0
TRICHLOROETHYLENE	2004	.	.	.	.	.	1875	11220	13095	0
NICKEL COMPOUNDS	2005	0	0	0	0	0	0	5730	5730	0

Key:

Recycled On-site: the amount of the toxic chemical recycled on-site during the calendar year for which the report was submitted.

Recycled Off-site: the total amount of the toxic chemical sent off-site for recycling during the calendar year for which the report was submitted.

Energy Recovery On-site: the total amount of the toxic chemical in waste burned for energy recovery on-site during the calendar year for which the report was submitted.

Energy Recovery Off-site: the total amount of the toxic chemical in waste sent off-site to be burned for energy recovery during the calendar year for which the report was submitted.

Treated On-site: the total amount of the toxic chemical treated on-site during the calendar year for which the report was submitted.

Treated Off-site: the total amount of the toxic chemical sent for treatment off-site during the calendar year for which the report was submitted.

Total Quantity Disposed or otherwise released On- and Off-site: the total amount of the toxic chemical disposed of or release due to production related events by the facility to all environmental media both on and off site during the calendar year for which the report was submitted.

Total Production-related Waste Managed: the sum of recycled on-site, recycled off-site, energy recovery on-site, energy recovery off-site, treated on-site, treated off-site, and quantities disposed of or otherwise released on- and off-site.

Non-production related Waste Managed: the total amount of the toxic chemical released directly to the environment or sent off-site for recycling, energy recovery, treatment, or disposal during the reporting year due to remedial actions, catastrophic events, such as earthquakes or floods, and one-time events not associated with normal or routine production processes.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-10
Summary of TRI Release Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Fugitive Air	Stack Air	Total Air Emissions	Surface Water Discharge	Underground Injection	Land Disposal	Total On-site Disposal or Other Releases	Total Off-site Disposal or Other Releases	Total On- and Off-site Disposal or Other Releases
TOLUENE	1988	2324	20916	23240	0	0	0	23240	0	23240
XYLENE (MIXED ISOMERS)	1988	2501	22514	25015	0	0	0	25015	0	25015
TOLUENE	1989	505	22550	23055	0	0	0	23055	0	23055
TRICHLOROETHYLENE	1989	4500	10104	14604	0	0	0	14604	0	14604
XYLENE (MIXED ISOMERS)	1989	2912	26216	29128	0	0	0	29128	0	29128
TOLUENE	1990	4236	38127	42363	0	0	0	42363	0	42363
TRICHLOROETHYLENE	1990	2840	25563	28403	0	0	0	28403	0	28403
XYLENE (MIXED ISOMERS)	1990	2538	22848	25386	0	0	0	25386	0	25386
TOLUENE	1991	4124	37115	41239	0	0	0	41239	0	41239
TRICHLOROETHYLENE	1991	5391	16175	21566	0	0	0	21566	0	21566
XYLENE (MIXED ISOMERS)	1991	2900	26855	29755	0	0	0	29755	0	29755
TOLUENE	1992	3000	26409	29409	.	0	0	29409	0	29409
XYLENE (MIXED ISOMERS)	1992	3100	27900	31000	.	0	0	31000	0	31000
TOLUENE	1993	3000	25277	28277	.	0	0	28277	0	28277
XYLENE (MIXED ISOMERS)	1993	3300	29700	33000	.	0	0	33000	0	33000
TOLUENE	1994	2500	22047	24547	.	0	0	24547	0	24547
XYLENE (MIXED ISOMERS)	1994	5000	42302	47302	.	0	0	47302	0	47302
METHYL ISOBUTYL KETONE	1995	1000	9552	10552	.	0	0	10552	0	10552
METHYL ISOBUTYL KETONE	1996	1200	11029	12229	.	0	0	12229	0	12229
XYLENE (MIXED ISOMERS)	1996	1167	10510	11677	.	0	0	11677	0	11677
METHYL ISOBUTYL KETONE	1997	1308	11611	12919	.	0	0	12919	0	12919
XYLENE (MIXED ISOMERS)	1997	1295	11658	12953	.	0	0	12953	0	12953
METHYL ISOBUTYL KETONE	1998	1950	11049	12999	.	0	0	12999	0	12999
XYLENE (MIXED ISOMERS)	1998	1751	9924	11675	.	0	0	11675	0	11675
METHYL ISOBUTYL KETONE	1999	2030	11503	13533	.	0	0	13533	0	13533

Key:

Fugitive Air: fugitive air emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Stack Air: stack or point source air emissions occur through confined air streams suck as stack, vents, ducts, or pipes.

Total Air Emissions: includes both fugitive air emissions and point source air emissions.

Surface Water Discharge: releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from confined sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff are also reportable to TRI under this category.

Underground Injection: underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment.

Land Disposal: the disposal of the toxic chemical to land at the facility that does not fall into one of the other on-site land release categories found in Sections 5.5.1 through 5.5.3 on the TRI Form R. Other disposal includes such activities as placement in waste piles and spills or leaks.

Total On-Site Disposal or Other Releases: include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type.

Total Off-site Disposal or Other Releases: a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site disposal or other release.

Total On- and Off-Site Disposal and Other Releases: the sum of total on-site disposal or other release and total off-site disposal or other releases.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-11
Summary of TRI Waste Transfer Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Transfers to Recycling	Transferred to Energy Recovery	Transfers to Treatment	Transfers to POTWs Non Metals	Transfers Off-site for Disposal or Other Releases	Total Transfers Off-site for Further Waste Management
Chromium Compounds	1988	0	0	0	0	0	250
Chromium Compounds	1989	0	0	0	0	0	250
Chromium Compounds	1990	0	0	0	0	0	250
Chromium Compounds	1991	0	0	0	0	0	250
Chromium Compounds	1992	0	0	0	0	0	17138
Chromium Compounds	1993	0	0	0	0	0	130522
Chromium Compounds	1994	0	0	0	0	0	20866
Chromium Compounds	1995	0	0	0	0	0	500
Chromium Compounds	1996	0	0	0	0	0	54586
Chromium Compounds	1997	0	0	0	0	0	250
Ethylene Glycol	1997	0	0	0	0	0	1850
Chromium Compounds	1998	0	0	0	0	0	0
Chromium Compounds	1999	0	0	0	0	0	0
Chromium Compounds	2000	.	.	.	.	.	.
Chromium Compounds	2001	.	.	.	.	.	.
Lead Compounds	2001	0	0	0	0	0	9
Chromium Compounds	2002	.	.	.	.	.	.
Lead Compounds	2002	0	0	0	0	0	13
Chromium Compounds	2003	.	.	.	.	.	.
Lead Compounds	2003	0	0	0	0	0	10
Chromium Compounds	2004	.	.	.	.	.	.
Lead Compounds	2004	0	0	0	0	0	3
Chromium Compounds	2005	.	.	.	.	.	.
Lead Compounds	2005	0	0	0	0	0	2

Key:

Transfers to Recycling: the total among of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year (January 1 - December 31) for recycling to manage the toxic chemical. This refers to the ultimate disposition of the toxic chemical, not the intermediate activities used for the waste stream.

Transferred to Energy Recovery: the total amount of the toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for energy recovery to manage the toxic chemical.

Transfers to treatment: the total amount of toxic chemical in the waste stream transferred from the facility to an off-site location during the calendar year for treatment to manage the toxic chemical.

Transfers to POWs Non Metals: the total amount of the toxic chemical in the waste stream transferred from the facility to all POTWs during the calendar year.

Transfers Off-Site for Disposal or Other Releases: sum of transfers to underground injection, RCRA Subtitle C landfills, other landfills, storage, solidification/stabilization of metals and metal category compounds, RCRA Subtitle C surface impoundments, other surface impoundments, land treatment, other land disposal, other off-site waste management, waste broker for disposal, and unknown.

Total Transfers Off-Site of Further Waste Management: the sum of transfers to recycling, transfers to energy recovery, transfers to treatment, transfers to POTWs and other off-site transfers, including transfers to disposal or other releases.

POTW = Publicly Owned Treatment Works

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Table B-12
Summary of TRI Waste Quantity Reports for Saint-Gobain Containers
RM 1.4-1.7 East

Chemical	Year	Recycled On-site	Recycled Off-site	Energy Recovery On-site	Energy Recovery Off-site	Treated On-site	Treated Off-site	Total Quantity Disposed or Otherwise Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
TOLUENE	1988	.	.	.	.	.	.	.	.	.
XYLENE (MIXED ISOMERS)	1988	.	.	.	.	.	.	.	.	.
TOLUENE	1989	.	.	.	.	.	.	.	.	.
TRICHLOROETHYLENE	1989	.	.	.	.	.	.	.	.	.
XYLENE (MIXED ISOMERS)	1989	.	.	.	.	.	.	.	.	.
TOLUENE	1990	.	.	.	.	.	.	.	.	.
TRICHLOROETHYLENE	1990	.	.	.	.	.	.	.	.	.
XYLENE (MIXED ISOMERS)	1990	.	.	.	.	.	.	.	.	.
TOLUENE	1991	226	0	0	0	0	0	41239	41465	.
TRICHLOROETHYLENE	1991	0	4260	0	0	0	0	21566	25826	0
XYLENE (MIXED ISOMERS)	1991	1857	0	0	0	0	0	29755	31612	.
TOLUENE	1992	200	0	0	0	0	0	29409	29609	0
XYLENE (MIXED ISOMERS)	1992	1998	0	0	0	0	0	31000	32998	0
TOLUENE	1993	354	0	0	0	0	140	27923	28417	0
XYLENE (MIXED ISOMERS)	1993	2988	0	0	0	0	561	30014	33563	0
TOLUENE	1994	324	0	0	0	0	0	24233	24557	0
XYLENE (MIXED ISOMERS)	1994	3520	0	0	0	0	0	43782	47302	0
METHYL ISOBUTYL KETONE	1995	1000	0	0	0	0	200	10552	11752	0
METHYL ISOBUTYL KETONE	1996	765	0	0	0	0	135	11329	12229	0
XYLENE (MIXED ISOMERS)	1996	800	0	0	0	0	200	10677	11677	0
METHYL ISOBUTYL KETONE	1997	883	0	0	0	0	157	12036	13076	0
XYLENE (MIXED ISOMERS)	1997	874	0	0	0	0	155	11924	12953	0
METHYL ISOBUTYL KETONE	1998	953	0	0	0	0	169	12830	13952	0
XYLENE (MIXED ISOMERS)	1998	845	0	0	0	0	152	11523	12520	0
METHYL ISOBUTYL KETONE	1999	895	0	0	0	0	158	13533	14586	0

Key:

Recycled On-site: the amount of the toxic chemical recycled on-site during the calendar year for which the report was submitted.

Recycled Off-site: the total amount of the toxic chemical sent off-site for recycling during the calendar year for which the report was submitted.

Energy Recovery On-site: the total amount of the toxic chemical in waste burned for energy recovery on-site during the calendar year for which the report was submitted.

Energy Recovery Off-site: the total amount of the toxic chemical in waste sent off-site to be burned for energy recovery during the calendar year for which the report was submitted.

Treated On-site: the total amount of the toxic chemical treated on-site during the calendar year for which the report was submitted.

Treated Off-site: the total amount of the toxic chemical sent for treatment off-site during the calendar year for which the report was submitted.

Total Quantity Disposed or otherwise released On- and Off-site: the total amount of the toxic chemical disposed of or release due to production related events by the facility to all environmental media both on and off site during the calendar year for which the report was submitted.

Total Production-related Waste Managed: the sum of recycled on-site, recycled off-site, energy recovery on-site, energy recovery off-site, treated on-site, treated off-site, and quantities disposed of or otherwise released on- and off-site.

Non-production related Waste Managed: the total amount of the toxic chemical released directly to the environment or sent off-site for recycling, energy recovery, treatment, or disposal during the reporting year due to remedial actions, catastrophic events, such as earthquakes or floods, and one-time events not associated with normal or routine production processes.

"." means the facility left that particular cell blank in its TRI Form R submission.

"0" means either that the facility reported "0" or "NA" in its TRI Form R submission.

Notes:

All measurements are in pounds.

Source:

EPA's Toxics Release Inventory Database. http//www.epa.gov/triexplorer.

Appendix C

Historical Photos

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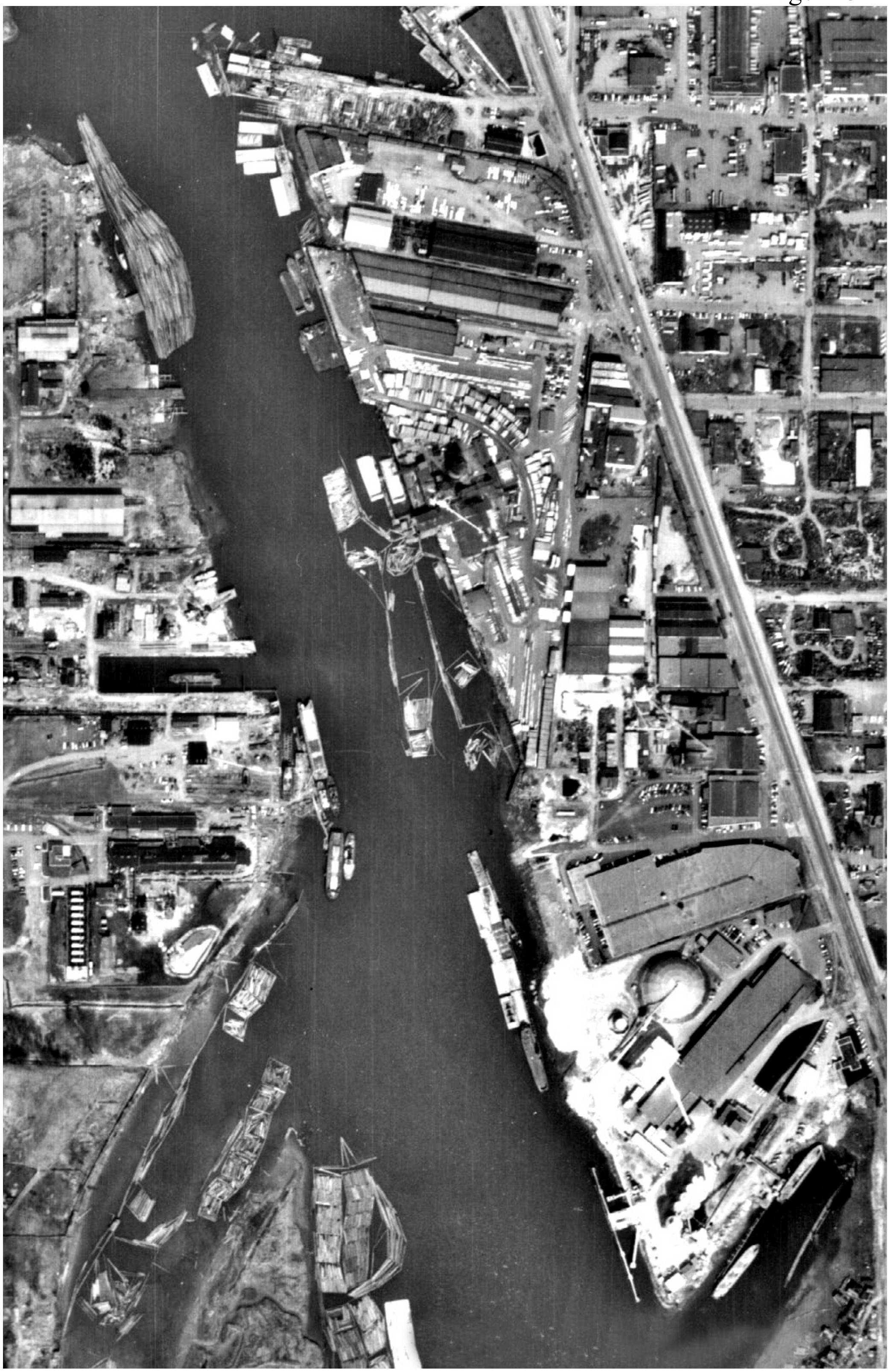
Appendix C – Aerial Photographs

P1: Aerial Photo of RM 1.2-1.7 from 1936.

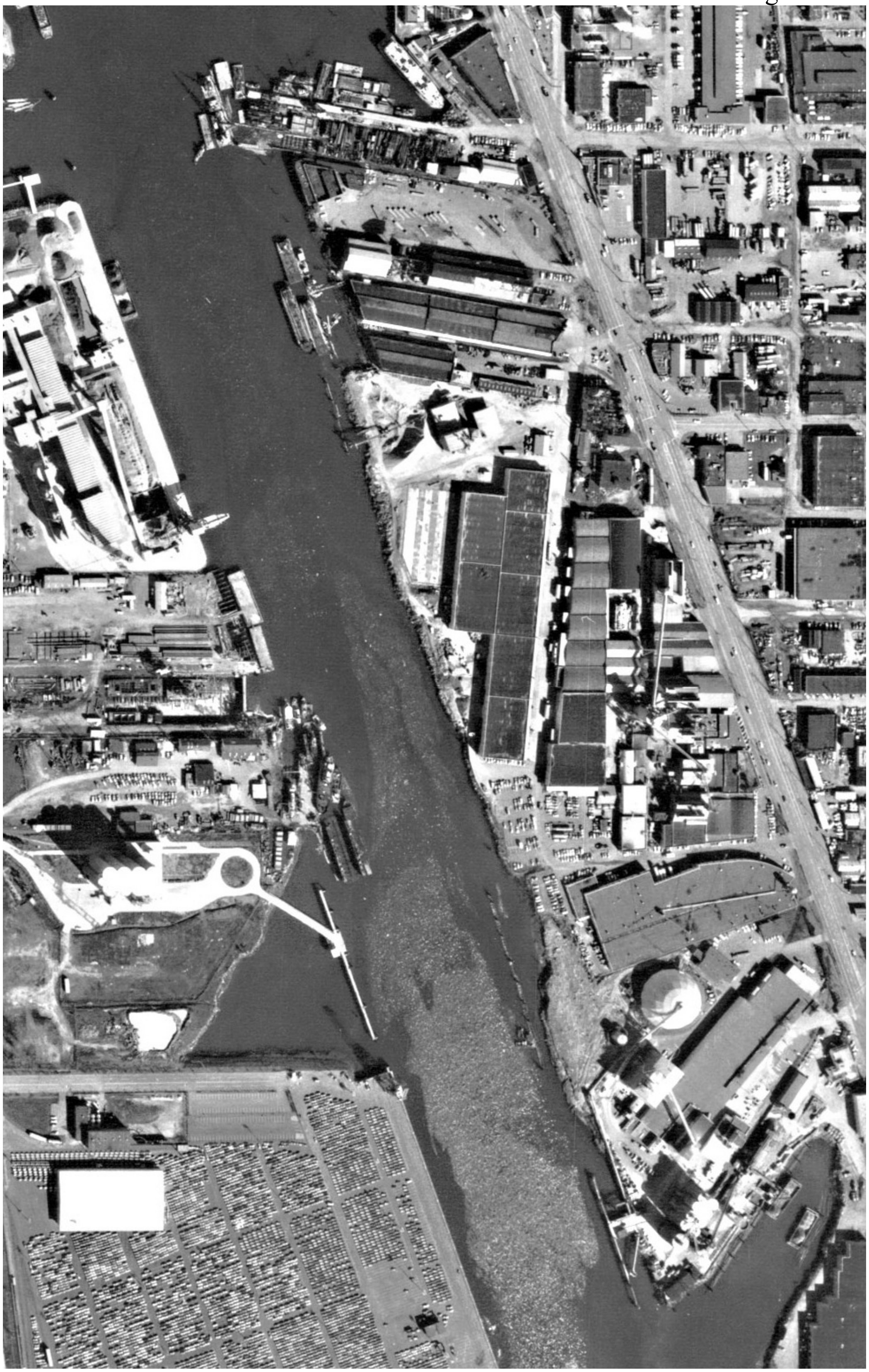
P2: Aerial Photo of RM 0 RM 1.2-1.7 from 1941.

P3: Aerial Photo of RM 1.2-1.7 from 1946.

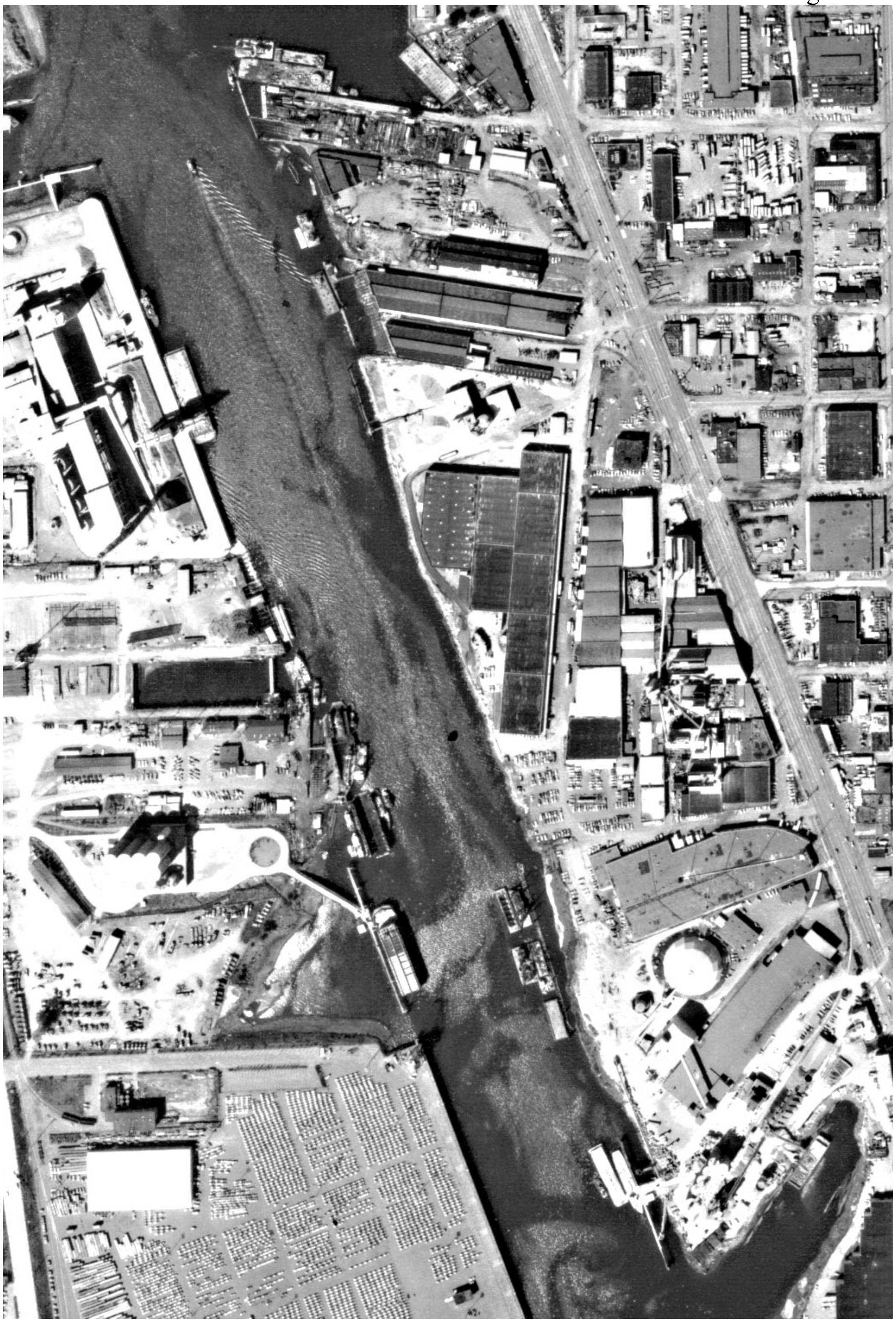


P4: Aerial Photo of RM 1.2-1.7 from 1956.

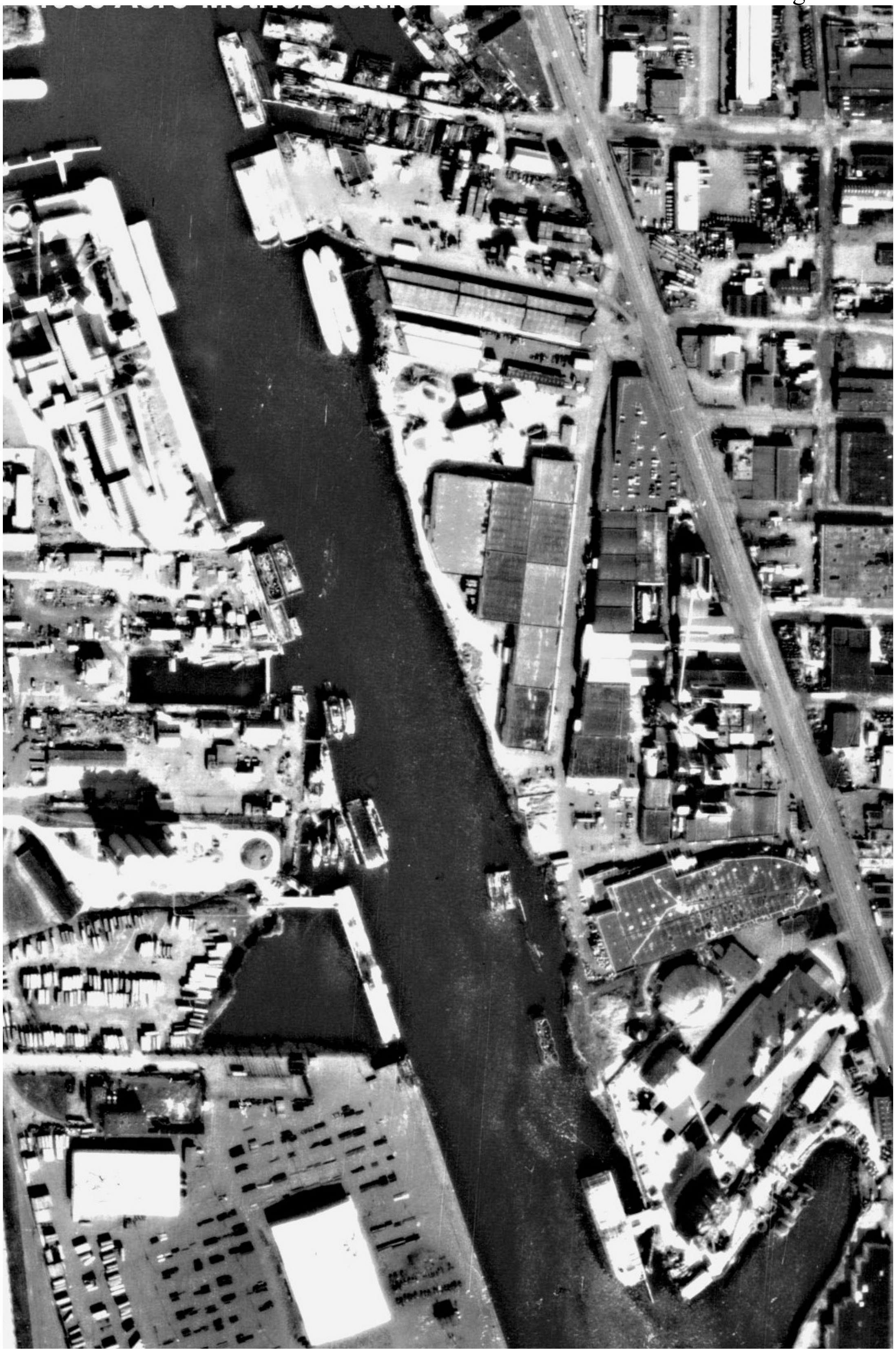
P5: Aerial Photo of RM 1.2-1.7 from 1969.



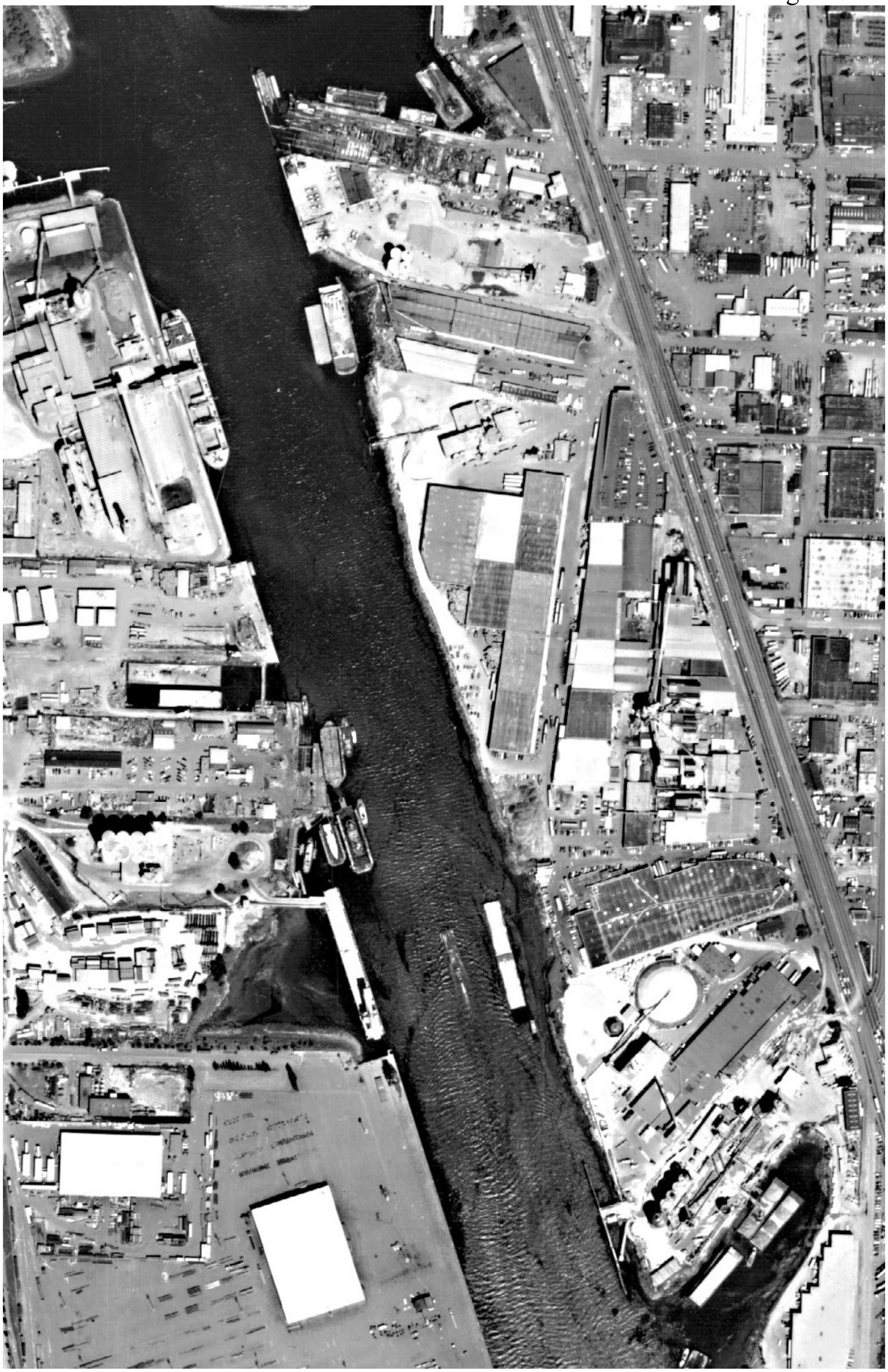
P6: Aerial Photo of RM 1.2-1.7 from 1974.



P7: Aerial Photo of RM 1.2-1.7 from 1977.



P8: Aerial Photo of RM 1.2-1.7 from 1985.



P9: Aerial Photo of RM 1.2-1.7 from 1990.

P10: Aerial Photo of RM 1.2-1.7 from 1995.

P11: Aerial Photo of RM 1.2-1.7 from 2004.